

PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN (PSHEP)

PARSONS



**WEST LAKE LANDFILL SUPERFUND SITE
OU-1 REMEDIAL DESIGN
BRIDGETON, MISSOURI**

OCTOBER 26, 2020



West Lake Landfill Superfund Site, Operable Unit 1 Remedial Design

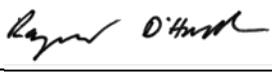
Parsons
Project Safety, Health, and Environmental Plan
Revision Date: 10/26/2020

Contract Identification: JOB NO: 451662 - WEST LAKE LANDFILL OU-1
Client: West Lake Landfill Trust

Reviewer Name: Darrell Pruitt, CSP,ASP,OHST,CHST,STSC
Reviewer Title: SH&E Manager

Reviewer Signature:  Date Reviewed: 10/26/2020

Approver Name: Ray D'Hollander
Approver Title: Project Manager

Approver Signature:  Date Approved: 10/26/2020

This PSHEP covers Parsons and Parsons-contracted work performed at the West Lake Landfill Superfund Site Operable Unit 1 (OU-1).

Table of Contents

Scope of Work	1
Parsons SH&E Policy Statement	2
Stop Work Authority.....	2
PSHEP Authority.....	3
Organizational Structure.....	3
Legal Compliance Register	5
Risk Register.....	5
Training, Certifications, Qualifications, and Competencies.....	6
Contractor Qualification, Management, and Site-Specific SH&E Plans	6
Contractor Qualification	6
Contractor Management.....	7
Contractor Site-specific Safety, Health, and Environmental Plans (SSHEPs).....	7
New Employee and Visitor Orientation	8
Employee Orientation.....	8
Visitor Orientation.....	8
Industrial Hygiene Monitoring.....	8
Industrial Hygiene Monitoring.....	8
Emergencies and Emergency Management.....	9
Incident Reporting, Investigation, and Management	10
Incident Reporting	10
Incident Investigation	12
Incident Management.....	12
Workers’ Compensation	13
Inspections, Self-assessments, and Audits	14
SH&E Inspections	14
Focused SH&E Inspections.....	15
SH&E Compliance Inspection	15
ESHARP Self-assessments.....	15
SH&E Audits.....	15
Employee-based Safety / Peer-based Observations	15
SH&E Performance Measurement	15
Meetings.....	16
Employee SH&E Committees.....	18
Communication, Consultation, and Awareness Campaigns.....	20
Rewards and Recognition.....	20



Enforcement and Discipline20
Substance Abuse Identification and Testing.....21

Appendix A - Legal Compliance Record
Appendix B --Risk Register
Appendix C – Activity Hazard Analyses
Appendix D – Training Matrix
Appendix E – Forms
Appendix F – Subcontractor Safety, Health, and Environment Plan – Feezor Engineering
Appendix G – Subcontractor Safety, Health, and Environment Plan – Ameripysics
Appendix H – Supporting Plans
 H.1 – Radiation Safety Plan
 H.2 – West Lake Site Management Plan
 H.3 – West Lake Emergency Response Plan
Appendix I – Subcontractor Safety, Health, and Environment Plan- Frontz and Bulldog

Attachment 1 – Coronavirus Disease 2019 (COVID-19) Information and Procedures
Attachment 2 - Worker’s Compensation Information
Attachment 3 - Respiratory Protection Plan

Acronyms and Abbreviations

Acronym	Definition
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
BS OHSAS	British Standard Occupational Health and Safety Assessment Series
BU	Business Unit
DI	Design Investigation
ESHARP	(Parsons) Environment, Safety, Health and Risk Program
ETA	estimated time of arrival
HAZWOPER	Hazardous Waste Operations and Emergency Response
ISO	International Organization for Standardization
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PM	Project Manager
PPE	Personal protective equipment
PSHEP	Project Safety, Health, and Environmental Plan
RD	Remedial Design
RODA	Record of Decision Amendment
SH&E	Safety, health and environmental
SHSO	Site Health and Safety Officer
SSHEP	(Contractor) site-specific safety, health, and environmental plan

Scope of Work

The Scope of the Project Safety, Health, and Environmental Plan (PSHEP) is presented in the Remedial Design Statement of Work, Operable Unit 1 (OU-1) West Lake Landfill Superfund Site, dated April 2019. Specifically, the PSHEP scope of work is focused on collecting additional information necessary to design and implement the Record of Decision Amendment (RODA) remedy by conducting additional field investigations in support of a Design Investigation (DI). Additional activities may be authorized following the Remedial Design (RD). This PSHEP will be modified accordingly should the scope of work change. Activities covered by this PSHEP include:

- Drilling to sample subsurface media in and around the relevant portions of the West Lake Landfill Superfund Site, and associated land-clearing and survey;
- Using downhole instrumentation and analysis of borings collected in Areas 1 and 2 of the West Lake Landfill OU-1;
- Sampling soil using hand tools in the Buffer Zone and Lot 2A2;
- Sampling surface water and sediment from Areas 1 and 2;
- Performing waste characterization sampling including soil boring spoils, decontamination water, and contaminated personal protective equipment (PPE) and sampling materials;
- Decontaminating equipment and PPE used during the design investigation;
- Performing environmental monitoring of work areas for exposure assessment; and
- Conducting a topographic and geophysical survey.

Parsons SH&E Policy Statement

Safety, Health & Environment Policy

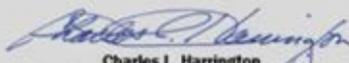
As an industry-leading engineering, construction, and technical services firm, Parsons is firmly committed to maintaining a safe, healthy, and environmental workplace at all its offices and project facilities, guided by the following tenets:

- SH&E stewardship is a core value.
- Executive management leads our SH&E processes and strives to continually improve our SH&E management systems.
- SH&E is a responsibility shared by all.
- SH&E performance is a key business performance indicator.
- SH&E performance will be communicated openly.
- Employees are given the expectations, knowledge, and skills necessary to perform their work to ensure they achieve high levels of SH&E performance.
- Employees and stakeholders are authorized and expected to stop work when conditions warrant it.
- Our SH&E efforts extend beyond our workplaces to include travel, our homes, and our communities.

To meet our SH&E performance objectives, all employees and stakeholders are expected to be actively engaged in SH&E issues. This requires the combined efforts of a concerned leadership team, responsible and knowledgeable line supervisors, and conscientious, well-trained employees and stakeholders.

At regular intervals, the executive management shall lead, monitor, and improve the performance of our SH&E management systems to ensure its continuing suitability, adequacy, and effectiveness.

Parsons shall meet or exceed legal and other requirements for SH&E and shall strive to conform to the international standards to which we subscribe. We will continually monitor and improve operations, procedures, technologies, and programs that are conducive to maintaining safe, healthful, and environmentally sound workplaces.



Charles L. Harrington
Chairman and Chief Executive Officer



PARSONS

Parsons' goal is zero health, safety and environmental incidents. To achieve this, the OU-1 RD project team, led by the Project Manager (PM), shall systematically, routinely, and continually identify the safety, health, and environmental (SH&E) risks to project personnel, processes, equipment, the general public, and the environment, and develop effective and reliable control measures to minimize or eliminate these SH&E risks. As the project work changes, the SH&E risks change, and these risks shall be continually assessed, with control measures continually refined as work progresses.

Stop Work Authority

Each Parsons employee and Parsons-contracted person is a critical leader for preventing injuries, illnesses, and adverse environmental impacts. Achieving SH&E excellence requires a personal commitment. Therefore, each employee is authorized to stop work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the work stoppage to the other affected parties (i.e., other employees, Field Project Managers, Project

Managers, clients, and regulatory agencies, as necessary) and further evaluate the Site conditions and adjust the work plan to resolve the safety, health, or environmental concern before restarting the work.

Each employee shall understand that he or she has the authority and the responsibility to stop work at any time when he or she notices an unplanned or unexpected issue that he or she believes will adversely affect the project's safety, health, or environmental risk. This concept is consistent with Parsons' SH&E core value.

Sometimes, the idea of "stop work" suggests that the project is shut down and all employees end their workday until the catastrophe is averted. Though this is a dramatic example of a legitimate stop work event, most stop work events are much simpler.

S.T.O.P.

1. Stop the task you are doing or intervene with a co-worker/contractor if appropriate.
2. Take immediate measures to notify any others affected. If there is no imminent danger, notify the appropriate field supervisors and site leaders. This is also a good time to make any other notifications, such as to the client.
3. Offer correction or get help if needed. Keep it positive. Affected parties shall discuss and gain agreement on the resolution of the stop work issue. The initiator of the stop work event shall be thanked for his or her concern.
4. Prepare to resume once the concern has been resolved. If necessary, suspend that task until the adjusted work plan can be reviewed and revised, when needed. When opinions differ regarding the validity of the stop work issue or adequacy of the resolution, the appropriate site leader shall make the final determination, giving full weight to all opinions and views. Positive feedback shall be provided to affected personnel regarding the resolution of the stop work issue.

There is no circumstance where retribution or retaliation may be directed toward an employee who conscientiously exercised his or her stop work authority.

PSHEP Authority

This PSHEP outlines requirements and guidelines developed by Parsons for project work. When implemented, these requirements help protect project personnel, visitors, the public, and the environment from the effects of SH&E risks. Parsons employees should never perform a task that may endanger their own safety and health, the safety and health of coworkers or the public, or the environment. This PSHEP shall be updated as conditions or work phases change. All Parsons employees and contractors shall receive a copy of this PSHEP, understand it, and implement the provisions contained in it.

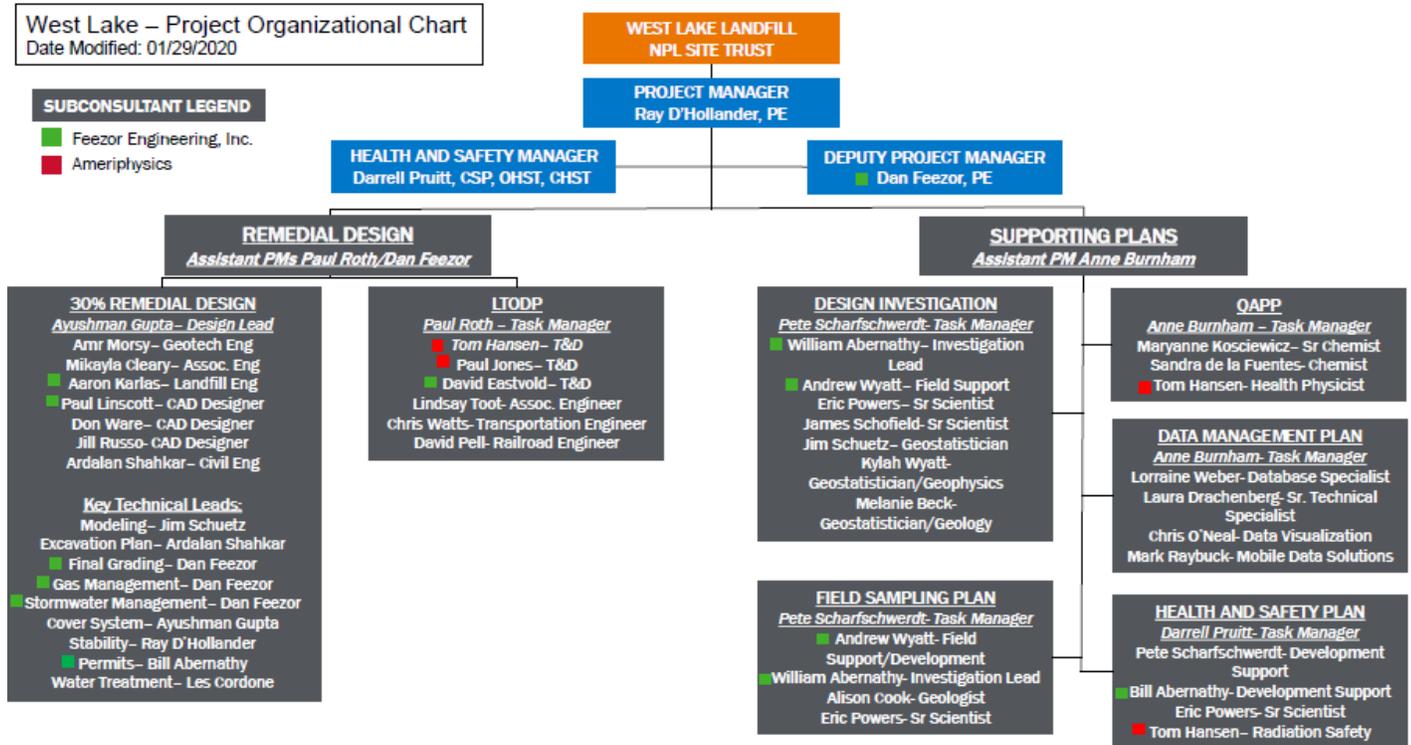
Parsons contractors shall establish their own SH&E programs for their work and employees. Contract specifications require each Parsons contractor to accept provisions of the Parsons PSHEP and prepare its own contractor site-specific safety, health, and environmental plan (SSHEP) for work activities that the contractor is responsible for performing. The PSHEP requirements identified for project personnel (e.g., incident reporting, training, certifications of competence and qualification, substance abuse identification and testing) shall apply to contractors and their workers, and such provisions shall be included in each contractor's SSHEP.

This PSHEP and its associated legal compliance register, risk register, hazard and risk analyses, work plans, procedures, contractor SSHEPs, compliance programs, best practices, training matrix, and certifications of competence and qualification apply to all locations, facilities, operations, tasks, and project work.

Organizational Structure

Parsons project personnel responsibilities are outlined in the following organization chart. The site safety organization is structured so that field personnel report to the Parsons Field Team Lead or designee, who, in turn, reports to the Project Health and Safety Manager for safety-related issues. Subcontractors report to their own health and safety personnel. The Parsons Field Team Lead or designee is responsible for authorizing all

work performed on any given day by reviewing the tasks and associated hazards with the assigned workers. This shall be done in cooperation with the Deputy PM from Feezor Engineering and the Radiation Safety Officer from Ameriphysics.



Key Project Stakeholders

PARSONS		
Project Manager	Ray D'Hollander, PE Ray.dhollander@parsons.com	315-720-7954
Project SH&E Representative	Darrell Pruitt, CSP, ASP, OHST, CHST, STSC Darrell.pruitt@parsons.com	812-605-2108
INF SH&E Director	John Barker John.Barker@parsons.com	704-558-4209
FEEZOR ENGINEERING		
Deputy Project Manager	Daniel Feezor, PE dfeezor@feezorengineering.com	217-836-8842
AMERIPHYSICS		
Radiation Safety Officer	Tom Hansen tom@ameriphysics.com	865-228-1997
BRIDGETON LANDFILL		
Landfill Division Manager	Erin Fanning efanning@republicservices.com	209-227-9531
ENGINEERING MANAGEMENT SUPPORT		
Project Coordinator	Paul Rosasco Paulrosasco@emsidenver.com	303-808-7227

Legal Compliance Register

Parsons shall comply with regulatory, legal, and other similar requirements in the jurisdictions where work is performed for the project. The legal compliance register identifies the SH&E-related laws, regulations, ordinances, and legal obligations that may impact the project. As legal requirements change during the lifecycle of the project, the changes shall be updated in the legal compliance register and their effects considered.

The project Legal Compliance Register is included in Appendix A of this document.

Risk Register

Parsons shall continually identify project SH&E risks and seek effective and reliable means to control these risks to an acceptable level. From these identified SH&E risks, additional policies, procedures, equipment, compliance programs, or special training required to control the risk of project activities shall be developed, communicated, monitored, and adjusted.

Hazard analysis and risk assessment planning, the basis of the risk register, is an ongoing process occurring throughout the life of the project. Hazard analysis and risk assessment planning should address items such as: routine and non-routine activities; activities of all persons having access to the workplace (including contractors, lower-tier contractors, visitors, and client representatives); any outside hazards that might impact the workplace or the people in the workplace; hazards associated with materials or equipment being used in the workplace; any changes or modifications in design, processes, legal obligations, safety system changes; and any human factors or capability issues. Any additional policies and procedures that are utilized to control and mitigate the risk of project activities will be developed, communicated, monitored and adjusted as necessary during the course of the project. Any such policies and procedures will be documented as necessary.

The project Risk Register is included in Appendix B of this document.

Compliance programs completed, reviewed, and approved for the West Lake Landfill project include:

- Radiation Safety Plan: see Item 25 of the legal compliance register (Appendix A)
- Emergency Response Plan: see Item 12 of the legal compliance register (Appendix A)

- Loading, Transportation, and Disposal Plan: see Items 16 and 17 of the legal compliance register (Appendix A)
- This PSHEP: see Items 1-11, 13-15, and 18-23 of the legal compliance register (Appendix A)

Activity Hazard Analyses (AHAs) included in this PSHEP (Appendix C) include:

- Drilling oversight (includes waste management and decontamination)
- Sediment sampling
- Sampling environmental media (includes waste management and decontamination)
- Driving on and off site
- Performing inspections, surveys, and monitoring

Training, Certifications, Qualifications, and Competencies

The project training matrix is included as Appendix D of this document.

All employees working on site shall have the following current training/certifications:

- 24- or 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training (see Item 2 of the legal compliance register)
- Site-specific hazardous communication training (see Item 11 of the legal compliance register)
- Site-specific hazard mitigation training (e.g., PPE, AHA) (see Item 7 of the legal compliance register)
- Radiation safety training (see Item 25 of the legal compliance register)

One supervisor on site shall have Supervisory HAZWOPER training, see Item 2 of the legal compliance register in Appendix A. One field team member per team shall have first aid and CPR training, see Item 3 of the legal compliance register in Appendix A.

Records of completed training for Parsons and Feezor Engineering employees are maintained at the project field office. Copies of Parsons employee training completion records and certificates can be obtained by contacting Darrell Pruitt at darrell.pruitt@parsons.com or calling his phone number at 812-605-2108. Copies of Feezor Engineering employee training completion records and certificates can be obtained by contacting Bill Abernathy at babernathy@fezorengineering.com or calling his phone number at 314-502-1299.

Contractor Qualification, Management, and Site-Specific SH&E Plans

Contractor Qualification

All contractors to be engaged in providing field services shall pass a contractor qualification process prior to engagement. The project shall provide the following information to each contractor prior to qualifying and selecting the contractor:

- Detailed statement of work.
- SH&E hazards and risks.
- Parsons minimum SH&E expectations.

To assist with the contractor qualification process, the contractor shall identify the following:

- Types of field activities to be conducted.
- Location of workplaces.
- Timing and sequence.
- Facilities, tools, and equipment to be used.
- Materials and consumables to be used.

In addition, the contractor shall provide as much of the following information as possible:

- Contractor's SH&E policy statement.
- A statement or proof that the contractor has an occupational safety and health or environmental management system compliant with standards such as American National Standards Institute (ANSI) Z10, British Standard Occupational Health and Safety Assessment Series (BS OHSAS) 18001, International Organization for Standardization (ISO) 14001, or the Occupational Safety and Health Administration's (OSHA's) Voluntary Protection Programs.
- The names and qualifications of those with SH&E responsibilities for this work (on site and off site).
- SH&E training compliance program and copies of training records for contractor employees expected to perform work on this contract.
- A copy of the contractor's compliance programs, competent person designations (United States), and other employee-related SH&E compliance certifications and qualifications (e.g., powered industrial truck driver, PPE user, qualified electrical worker).
- SH&E awards earned.
- Occupational injury and illness statistics for the past three years.
- Explanations for any SH&E enforcement notices issued against the contractor by any SH&E regulator
- Lists of anticipated/preferred lower-tier subcontractors and suppliers.
- Its proposed SSHEP and associated site-specific risk assessments or AHAs for the work.

This information shall be evaluated by the project SH&E representative and the PM (or delegate) using the Teaming Partner/Contractor SH&E Qualification Scorecard form and the SSHEP Review form (see Appendix E).

Contractor Management

Contractors are accountable and responsible for their employees and work activities. However, the PM shall ensure that contractors' work (and that of their lower-tier subcontractors) is:

- Being performed in compliance with the contracts;
- Being managed consistent with the project's SH&E processes and with Parsons' Environment, Safety, Health and Risk Program (ESHARP) Guidebook; and
- Meeting the project's SH&E expectations.

The PM shall conduct SH&E alignment meetings, kickoff and premobilization meetings, two-week look-ahead meetings, weekly/daily progress meetings, and other routine meetings to gauge the contractors' progress and understanding of the work. Such meetings shall include lower-tier subcontractors, when applicable.

The PM and the SH&E representative shall conduct and document contractor-specific SH&E inspections, SH&E audits, and other engagement activities to validate that the contractors' work meets Parsons' SH&E expectations. Such inspections, audits, and engagement activities shall include lower-tier subcontractors, when applicable.

Contractor Site-specific Safety, Health, and Environmental Plans (SSHEPs)

Hazard analysis and risk assessment planning is an ongoing process occurring throughout the life of the project. Hazard analysis and risk assessment planning should address items such as:

- Routine and non-routine activities;
- Activities or modifications in design, processes, legal obligations, safety system changes; and
- Any human factor or capability issues.

Feezor Engineering's SSHEP is included as Appendix F.

Ameriphysics' SSHEP is included as Appendix G.

Frontz's and Bulldog's SSHEPs, who will be providing drilling services during the investigation, are included as Appendix I.

New Employee and Visitor Orientation

Employee Orientation

Each person assigned to a project team shall receive an initial project- and site-specific orientation beginning on their first day of work. Such persons include new Parsons employees, existing Parsons employees reassigned to the project, contractors, lower-tier contractors, teaming and JV partner employees, suppliers, vendors, client representatives, members of the leadership team, and other stakeholder employees.

No worker shall start work on tasks for which he or she does not have the verified knowledge, skills, training, certifications, qualifications, and competencies to complete successfully, consistent with the risk control strategies defined in the risk register (Appendix B) and its associated risk assessments.

A general employee orientation will be provided for workers and visitors to the site by the Site Supervisor or a designee. In addition, the Bridgeton Landfill Contractor Safety Orientation is required every 12 months and is administered by the Bridgeton Landfill Environmental Manager. Site workers will likely need radiation safety certification to be determined and administered by the Radiation Safety Officer. Finally, personnel on site will need to be trained and fit-tested for use of a respirator.

Visitor Orientation

Visitors to a project shall receive an orientation briefing appropriate for their visits.

No visitor shall be permitted access to the project site unless s/he has completed visitor orientation and is escorted continually by a knowledgeable member project team.

Industrial Hygiene Monitoring

Industrial Hygiene Monitoring

The following assignments, roles, tasks, operations, or worksites may require baseline, initial, routine, or continual industrial hygiene monitoring.

- **Radiation** - Site monitoring for radiation will be instituted for the OU-1 RD. Initial ambient radiation surveys, personnel exposure monitoring, area air sampling, and equipment radiation screening are all aspects of the Radiation Safety Plan in Appendix H. All workers directly involved with handling radiation impacted material are required to wear personal dosimetry.

Evaluation of area and personnel monitoring results is performed by the on-site radiological control supervisor. Details on action limits for site conditions and dosimetry are included in the attached Radiation Safety Plan.

- **Respirator** - If employees are working at the jobsite and will have "less than 30 days" of potential exposure over the course of 12 months, they will only need to fill out the WorkCare – OSHA Respirator Questionnaire long version form (Appendix B-8 of the Design Investigation Work Plan).
 1. This form will need to be completed by the employee and sent to Parsons' SH&E Representative, who will send over to WorkCare for review and approval.
 2. If the employee has not had a recent fit test completed, they must do so.
 3. WorkCare results will be sent to the PM and employee for their records.

If an employee will be working at the jobsite and will have more than 30 days of potential exposure over the course of 12 months, they will need to reach out to the Parsons SH&E representative for an inpatient appointment.

1. WorkCare will contact the employee with directions to the clinic and what to bring with them.

2. The employee will need to take their respirator with them to this appointment.
3. Once clearance is received from WorkCare, the Parsons SH&E representative will send it to the PM and employee for their records.
4. The clearance will be good for one year.

Industrial hygiene monitoring results are maintained at the site field office. Additional details are included in Attachment 3. Copies of industrial hygiene monitoring results may be obtained by contacting Darrell Pruitt at darrell.pruitt@parsons.com or calling him at 812-605-2108.

Emergencies and Emergency Management

To report any emergency by phone, dial 911 and be prepared to describe the emergency and its location. Other relevant emergency response contacts include:

Daniel Feezor – Emergency Response Manager	217-836-8842
Erin Fanning – Bridgeton Landfill Division Manager	209-227-9531
Christine Jump – EPA Region 7 Regional Project Manager	913-551-7141
MDNR Environmental Response Spill Line	573-645-8943
Maynard Howell – Robertson Fire Protection District	314-575-5011
Battalion Chief – Pattonville Fire Protection District	314-393-4802
Jim Usry - Assistant Fire Chief, Pattonville Fire Protection District	314-393-4807
Donald Hood – Bridgeton Police Chief	314-420-9112
Michele Clark – St. Louis County Office of Emergency Management	314-615-9508

The project shall display posters and stickers with the proper emergency number near phones and in common areas.

The following are nearby hospitals and urgent care centers.

SSM Health DePaul Hospital

12303 De Paul Drive, Bridgeton, Missouri 63044
314-344-6000

SSM Health St. Joseph Hospital

300 First Capitol Drive, Saint Charles, Missouri 63301
636-947-5000

Total Access Urgent Care

12409 St. Charles Rock Road, Bridgeton, Missouri 63044
314-455-4046

Concentra Medical Center

1794 Zumbahl Road, Saint Charles, Missouri 63303
636-947-1666

The hospitals listed above should be utilized in case of serious and/or life-threatening injuries, if they arise. The other facilities (Total Access Urgent Care and Concentra Medical Center) should be utilized for minor first aid and/non-life-threatening injuries. Routes to all facilities will be posted in a common area or areas for workers, and reviewed routinely (i.e., during morning safety tool-box talks) with staff. Additionally, any relevant

road closings/construction that may impact routes will be discussed. For Parsons employees, WorkCare will also be contacted.

Each project stakeholder shall be familiar with the kinds of alarms on their project site and know how to effectively respond when an alarm sounds or when an emergency order is given. In addition, project workers shall be familiar with, and participate in, worker accountability protocols. Project-specific emergency response roles and responsibilities, and worker accountability protocols are described in the site-specific emergency action plan.

The West Lake Landfill Project Emergency Response Plan is included with the Design Investigation Work Plan as Appendix B-5.

The project has a Business Continuity Plan incorporated into the attached Emergency Response Plan that will be followed when an emergency occurs. Project workers shall understand their roles in helping to ensure the continuity of critical operations and services during and after an emergency.

Incident Reporting, Investigation, and Management

Incident Reporting

An incident that triggers Parsons' incident reporting, investigation, and management process is any of the following:

- An injury of any significance is sustained by anyone on a Parsons-controlled or Parsons-managed worksite;
- An injury of any significance is sustained by any Parsons employee while the employee is in a travel status in support of Parsons business;
- An illness of any significance is sustained by anyone and manifests its signs or symptoms on a Parsons-controlled or Parsons-managed worksite;
 - Attachment 1 of this PSHEP includes information related to Coronavirus, also known as COVID-19. This attachment includes information related to Parsons' business travel procedures, procedures to utilize on site to minimize the spread of COVID-19, as well as a questionnaire that will be utilized for site visitors. In the event that travel restrictions between states impact the ability of the work to be performed, USEPA will be notified as required in accordance with the requirements of the Force Majeure provisions of the ASAOC Amendment.
- An illness of any significance is sustained by any Parsons employee and manifests its signs or symptoms while the employee is in a travel status in support of Parsons business;
- An injury or illness of any significance is sustained by anyone and is related to Parsons-controlled or Parsons-managed work activities;
- An unplanned, unauthorized, or non-permitted release of a hazardous substance or other environmentally significant substance occurs on a Parsons-controlled or Parsons-managed worksite, irrespective of whether the release meets any threshold for regulatory reporting;
- A hazardous substance release on a Parsons-controlled or Parsons-managed worksite exceeds an environmental permit requirement or a regulatory threshold;
- An unplanned release of a hazardous substance or other environmentally significant substance occurs anywhere and affects Parsons-controlled or Parsons-managed work activities;
- An unplanned security or law enforcement event of any significance occurs on a Parsons-controlled or Parsons-managed worksite;

- An unplanned security or law enforcement event occurs that directly affects a Parsons employee while the employee is in a travel status in support of Parsons business;
- An unplanned event involving property damage occurs on a Parsons-controlled or Parsons-managed worksite;
- A motor vehicle-related event of any significance occurs involving vehicle or facility damage on a Parsons-controlled or Parsons-managed worksite, or in support of Parsons work;
- A motor vehicle-related event of any significance occurs involving vehicle or facility damage and involving a Parsons employee, while the Parsons employee is in a travel status in support of Parsons business; or
- An unplanned event occurs on a Parsons-controlled or Parsons-managed worksite that could have caused an injury, an illness, environmental damage, or property damage, but did not because of the intervention of random or fortunate circumstances and conditions. These types of incidents also are called near misses, near hits, and close calls.

When a person detects an incident, the person shall immediately implement the following incident reporting process.

Step 1: Does the person perceive that the incident is an emergency?

- No: Proceed to Step 2.
- Yes: Stop work, summon the appropriate emergency services, activate an alarm, or direct, by name, a nearby person to summon emergency assistance. Render first aid or another emergency assistance, as appropriate. Follow the site-specific emergency action plan to respond to the emergency. Follow the instructions of qualified emergency responders. Proceed to Step 2.

Step 2: Report the incident to: Daniel Feezor, the project Emergency Response Manager.

Step 3: Report the incident to: Erin Fanning, Bridgeton Landfill Support.

Step 4: Does the incident involve a work-related injury or illness?

- No: Proceed to Step 5.
- Yes: Did a Parsons employee working in the United States or Canada sustain the injury or illness?
- No: Proceed to Step 5.
- Yes: The affected employee, supervisor, or project SH&E representative shall call WorkCare at 888-449-7787 when first aid beyond simple or obvious self-care may be needed. For example, WorkCare shall be called for work-related muscle strains, sprains, possible fractures, lacerations or punctures, head injuries, eye injuries, joint injuries, or concerns related to ill health. Proceed to Step 5.

Step 5: Cooperate with any related investigations or reviews.

The PM (or delegate) shall make an initial report of the incident to the Business Unit (BU) SH&E Director (or delegate). Further investigation may be necessary.

For significant work-related injuries, illnesses, environmental incidents, security incidents, or property damage incidents, the PM (or delegate) shall make the above initial incident report telephonically and immediately. This immediate initial incident report is essential as Parsons may have to report the significant incident to one or more regulatory authorities within a few hours of the occurrence of the incident. Examples of significant incidents are those that involve:

- One or more fatalities;

- One or more injuries or illnesses requiring a worker to be treated in an emergency room or requiring in-patient hospitalization;
- An injury to a visitor or member of the public;
- An event that may present adverse media press to Parsons or the project;
- A release of a substance requiring a report to a governmental regulator;
- A criminal injury;
- A law enforcement arrest; or
- Property loss or damage exceeding an initial estimate of USD \$50,000.

After the immediate telephonic notification (for significant incidents), or after determining that an immediate telephonic report is unnecessary (for all other incidents), the PM (or delegate) shall create and submit the initial report of the incident in IndustrySafe (Parsons' incident reporting software) within 4 hours of the occurrence of the incident, or as soon as practical.

All project team members, including those directly affected by the incident, shall cooperate fully with any related incident investigations and management system process reviews.

Incident Investigation

The PM shall ensure that significant incidents (including significant near misses) are formally investigated. Incident investigations seek facts, not fault. The result of a properly conducted incident investigation is thoughtful identification of root causes of the incident and effective corrective actions and recommendations to prevent similar incidents from recurring. Incident summaries and any documents associated with incident investigations shall be submitted and retained within the IndustrySafe record associated with the incident.

The investigation process starts as soon as the initial report of the investigation is submitted. The PM (or delegate) shall lead the investigation and shall seek assistance from the project SH&E representative or BU SH&E Director (or delegate) for subject matter expertise and investigation support. Depending on the incident's complexity and consequences (or potential consequences), the BU SH&E Director may commission a corporate investigation team to work collaboratively with the PM's investigation process. A formal incident investigation report with corrective actions and accountability assignments shall be distributed to the appropriate members of the project team and Parsons leadership team and submitted in IndustrySafe as a part of the IndustrySafe record of the incident.

After the investigation report is submitted, the PM shall ensure that the project team is aware of any findings, lessons learned, and the status of the corrective actions identified in the incident investigation report. In addition, the PM shall prepare for an Executive Incident Review to formally involve the Parsons executive leadership team.

Incident Management

For an incident involving a Parsons employee who sustained a work-related injury or illness, the PM shall designate a project team member or a Parsons workers' compensation specialist to communicate with the affected worker to collaborate with his or her care and treatment and to help ensure that the medical providers understand the employee's job roles and opportunities for the employee to engage in alternative work. Parsons' objective is to ensure our employees receive the right care as soon as possible and can return to work with maximum medical improvement. The PM shall make an effort to communicate with the affected employee as soon as practical to ensure the employee knows Parsons and the project team are concerned with the employee's health and welfare.

If care at a clinic or hospital for an injured Parsons employee is required, the forms in the Workers' Compensation section related to treatment and workers' compensation billing should be provided directly to the care provider.

If an injured or ill employee is out of work, is restricted from his or her usual work-related activities, or is transferred to an alternative work role, the PM (or delegate) shall routinely communicate with the affected employee, the designated Parsons workers' compensation specialist, and the project SH&E representative to see how the employee is progressing, to ensure the employee knows Parsons and the project team remain concerned with the employee's continuing health and welfare, and to receive an update on the employee's return-to-work status. The PM (or delegate) shall then update the employee's return-to-work status (and any other details) within the IndustrySafe record associated with the incident.

The PM shall require direct contractors on the project team to submit routine status reports related to their workers who have sustained work-related injuries or illnesses while performing Parsons work on Parsons-controlled or Parsons-managed worksites. These status reports, at a minimum, shall describe the current condition of the injured or ill worker (until the worker has reached maximum medical improvement) and the worker's return-to-work status. The PM (or delegate) shall then update the worker's return-to-work status (and any other details) within the IndustrySafe record associated with the incident.

Workers' Compensation

Donna Miller (donna.miller@parsons.com; 661-904-0978) is the Parsons point of contact for this project for all workers' compensation matters. When an employee is injured or made ill as a result of work-related activities, it is essential that we abide by local workers' compensation laws and regulations. Additional information is included in Attachment 2. The following information will be needed when seeing to the evaluation and treatment of Parsons employees who sustain work-related injuries or illnesses.

Medical Providers

Total Access Urgent Care PC
Urgent Care Center/Walk-In
 12409 Saint Charles Rock Rd
 Bridgeton, MO 63044
 314-455-4046

Concentra Medical Center
Occupational/Industrial Medicine
Urgent Care Center/Walk-In
 1794 Zumbahl Road
 Saint Charles, MO 63303
 636-947-1666

Hospitals

SSM Health St. Joseph Hospital - St. Charles
Hospital - General
 300 1st Capitol Dr
 Saint Charles, MO 63301
 636-947-5000

SSM Health DePaul Hospital
Hospital - General
 12303 De Paul Dr
 Bridgeton, MO 63044
 314-344-6000

In Missouri, in the event of a non-emergency work-related injury, Parsons has the right to select the treating provider (medical control for life of claim) within Parsons' insurance carrier's network. In an emergency, the employee may be treated by the closest emergency room for the initial visit. An employee cannot choose to use their own provider for either emergency or non-emergency situations.

Internal Notification Requirements of Managers for a Work-Related Injury or Illness:

The employee's Manager must complete an IndustrySafe incident report within 4 hours of his or her knowledge of the incident.

The employee's Manager must promptly (i.e., the same day) notify the SH&E Director and Parsons' Workers' Compensation Claims Manager Donna Miller (donna.miller@parsons.com or 661-904-0978).

If the work-related incident is serious/life threatening or requires emergency response, the project manager will first call 911 or local emergency medical services before contacting the SH&E Director, filing the IndustrySafe online incident report, or involving WorkCare.

For all other work-related injury(s) or illness(s), Parsons' employees shall promptly contact WorkCare, before seeking medical care, because this will provide the greatest opportunity for appropriate intervention.

After consulting with WorkCare, if medical care is indicated or requested, the Field Manager (preferred) or designated alternate shall accompany the injured worker to the office/project's designated occupational medical clinic listed below.

WorkCare's Incident Intervention is available for all Parsons employees, 24 hours a day, 7 days a week, and 365 days a year (24/7/365).

WorkCare:

- When dialing from North America: 888-449-7787
- When dialing from outside of North America: 714-456-2104

Unless the injury or illness is life threatening, a medical emergency, or after-hours at the occupational medical clinic, efforts should be made for the injured employee to be seen at the Occupational Medical Clinic listed above and not at a hospital emergency room.

The procedures above are intended to enhance our incident reporting and investigation processes, assure quality care for injured employees, and ensure hazards are resolved to prevent recurrence.

Inspections, Self-assessments, and Audits

The scope of the project's inspection, self-assessment, and audit protocols includes all site and facility locations controlled by the project, including sites and facilities not typically occupied, such as material and equipment storage areas, as-needed fabrication areas, and parking areas. In addition, these protocols include the physical site, grounds, and outdoor environmental infrastructure controlled by the project. Contractor-controlled worksites and operations are included.

SH&E Inspections

An SH&E inspection is an in-person, on-site verification (by direct observation) that work is being performed and equipment and infrastructure is being used and maintained in accordance with the risk register and associated SH&E policies, procedures, regulations, laws, and best practices.

The findings of SH&E inspections and associated non-conformances arising out of the inspections shall be documented, and non-conformances shall be resolved as soon as practical.

The following daily and start-of-shift SH&E inspections shall be conducted and documented by each supervisor (or knowledgeable person) prior to conducting work:

- Drill rig inspections (see drilling contractor's SSHEP); and
- When drilling, prior to advancing mechanical drills, complete the subsurface clearance checklist (see Appendix B-8 of the Design Investigation Work Plan).

Focused SH&E Inspections

Focused SH&E inspections shall be conducted by the PM and other designated knowledgeable people in accordance with the following schedule. This schedule includes contractor worksites and operations over which Parsons has contractual authority. On a weekly basis, a PM- or designee-led SH&E audit will be performed using the attached form. Information documented during the audit shall be entered into IndustrySafe by the auditor or the project SH&E manager. Deficiencies or improvement observations should be assigned a corrective action, responsible person, and deadline for implementation.

SH&E Compliance Inspection

SH&E compliance inspections shall be conducted in accordance with the following schedule. This schedule includes contractor worksites and operations over which Parsons has contractual authority. Semi-annual SH&E compliance inspections will be led by a project SH&E representative. This compliance inspection will audit the project against the attached legal compliance register (Appendix A) and risk register (Appendix B).

ESHARP Self-assessments

An ESHARP self-assessment is a snapshot of how well the project is conforming to the principles in the ESHARP Guidebook. The PM shall complete an ESHARP self-assessment in IndustrySafe once each quarter for projects with a staffed duration lasting six months or more, with five or more full-time employees (or 25 or more contractor workers) at a field site.

SH&E Audits

An SH&E audit is an internal review of the project's SH&E management systems, including the SH&E management systems of contractors and lower-tier contractors performing project field activities. SH&E audits led by a qualified SH&E auditor appointed by the BU SH&E Director (or delegate) shall be performed semi-annually. This schedule includes contractor SH&E management systems associated with work over which Parsons has contractual authority.

Employee-based Safety / Peer-based Observations

The employee-based safety / peer-based observations are designed to help the project leadership team understand the safe and unsafe actions that are occurring so that programmatic attention can be focused on the processes that need improvement. Conscientious employees can offer (and receive) tangible feedback for safety-conscious acts and behavior and for acts and behavior that need improvement. Observations are anonymously reported to a designated project team member.

SH&E Performance Measurement

No more than three business days after the close of the monthly reporting period, the PM (or delegate) shall report the following information through the project's organizational chain of command and to the BU SH&E Director (or delegate).

Leading Indicators of SH&E Performance

- Number of focused SH&E inspections performed and documented
- Number of SH&E compliance inspections performed and documented
- Number of near misses reported and investigated
- Number of SH&E-related rewards and recognitions dispensed among project stakeholders
- Number of direct contractors not used due to SH&E disqualification

Trailing (Lagging) Indicators of SH&E Performance (Parsons Employees)

- Number of hours worked on the project by Parsons employees

- Number of Parsons employee injuries or illnesses leading to lost time
- Number of Parsons employee injuries or illnesses leading to restricted duty or transfer
- Total number of all Parsons employee recordable injuries or illnesses

Trailing (Lagging) Indicators of SH&E Performance (Direct Contractors)

- Number of hours worked on the project by all direct contractor employees
- Number of direct contractor worker injuries or illnesses leading to lost time
- Number of direct contractor worker injuries or illnesses leading to restricted duty or transfer
- Total number of direct contractor worker recordable injuries or illnesses

Meetings

Risk communication and planning meetings shall routinely take place on the project. This section of the PSHEP describes these meetings, their structure, their participants, their expected frequency, and whether they are to be documented. If these meetings are to be documented, then this section of the PSHEP also describes what is documented and where these documented meeting records are maintained.

Other meetings beyond these listed may be needed to help ensure that project risks are communicated and risk controls are planned adequately.

- Stakeholder SH&E Alignment Meetings
 - Relevant members of the project staff and stakeholders introduce Parsons SH&E expectations to new contractors or other stakeholders performing work on the project.
 - These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
 - Meeting documentation will be maintained at the on-site field office.
- Project Kickoff and Premobilization Meetings (PM, staff, line supervisors, stakeholders)
 - Meeting is held to establish initial site conditions, verify field office and site infrastructure availability, verify that initial supplies, tools, and equipment are available, and reinforce work initiation and SH&E expectations among stakeholders,
 - Attendees confirm that necessary work instructions, AHAs, SH&E programs, and SH&E training and qualifications have been completed and have been communicated to the necessary personnel.
 - Unresolved PSHEP implementation tasks are identified, and there is an agreed path to their resolution.
 - These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
 - Meeting documentation will be maintained at the on-site field office
- Two-week Look-Ahead Meetings (PM, staff, line supervisors)
 - Relevant members of the project staff and stakeholders plan the work activities over the next two or more weeks to ensure adequate SH&E planning is built into the schedule and that the planned risk controls are still valid and consistent with the risk register (Appendix B).

- These meetings shall be formally documented (see form in Appendix B-8 of the Design Investigation Work Plan), with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
- Meeting documentation will be maintained at the on-site field office.
- Daily/Pre-task Briefings (line employees and line supervisors)
 - Line employees and line supervisors conduct briefings prior to beginning any task using AHA or other job-specific risk assessment tool.
 - Meeting documentation will be maintained at the on-site field office.
- Work Pause/“Take 5” Briefings (line employees and line supervisors)
 - Line employees and line supervisors conduct these briefings when something occurs that was not planned and requires a brief reassessment of the work to continue.
 - An AHA or other job-specific risk assessment process is used, with modifications applied as necessary to account for the unplanned event.
 - Meeting documentation will be maintained at the on-site field office.
- Stop-Work Meetings (line employees, line supervisors, PM/staff)
 - Any employee who notices an unsafe condition, act, or behavior that precludes continuing the work as planned, may conduct a stop-work meeting.
 - An AHA or other job-specific risk assessment process will be used, with modifications applied as necessary to account for the unplanned event.
 - A stop-work meeting may involve a lengthy work stoppage and invoke other reporting requirements to ensure the work is ready to resume. The stop-work meeting will determine the need for alterations to the work, and result in those changes. “Lessons learned” will developed and distributed both with the OU-1 RD Team and others, as applicable.
 - These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
 - Meeting documentation will be maintained at the on-site field office.
- Toolbox Talks (PM, staff, line supervisors, stakeholders, line employees)
 - Talks will be conducted by stakeholders and employees regularly.
 - Talks will include a briefing, prepared by the primary presenter) on an SH&E topic relevant to the work group.
- Weekly All-Hands Meetings (all employees and stakeholders)
 - The PM typically leads these meetings to encourage the project team, to recognize and reward outstanding employees and stakeholders, and to ensure the Parsons SH&E core value is expressed.
 - These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
 - Meeting documentation will be maintained at the on-site field office.
- Other Meetings

- Other meetings include those with building trades councils, unions, guilds, and collective bargaining units and meetings with SH&E regulators.
- These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
- Meeting documentation will be maintained at the on-site field office.

Employee SH&E Committees

This section of the PSHEP describes the constituency and protocols of the project's employee SH&E committees. A properly commissioned employee SH&E committee has a charter, a description of its authority and responsibilities, operating procedures, and committee member roles and responsibilities.

The committee will include at least one member from Parsons, and at least one member from each of the subcontractors. All team members present on the day of a meeting are encouraged to attend. Written records of the minutes, actions, and recommendations of each employee on the SH&E committee shall be maintained. This section of the PSHEP also describes where the SH&E committee records are maintained.

Purpose

The purpose of the committee is to bring all Parsons and subcontractor employees together to achieve and maintain a safe, healthful workplace.

Objective

The committee has four objectives:

1. Involve employees in achieving a safe, healthful workplace;
2. Promptly review all safety-related incidents, injuries, accidents, illnesses, and deaths;
3. Conduct monthly workplace inspections, identify hazards, and recommend methods for eliminating or controlling the hazards; and
4. Annually evaluate the workplace safety-and-health process and recommend to management how to improve the process.

Goal

The goal of the employee SH&E committee is to eliminate workplace injuries and illnesses by involving employees and managers in identifying hazards and suggesting how to prevent them.

Representatives

The employee SH&E committee will have one representative from each company working at the project. Employee representatives can volunteer, or their peers can elect them. Each representative will serve a continuous term of at least six months.

Chairman and Vice-Chairman

The employee SH&E committee will have two officers: Chairman and Vice-Chairman.

The Chairman will be an employee representative, and the Vice-Chairman will be a management representative.

- Duties of the Chairman:
 - Schedule regular committee meetings.

- Develop written agendas for conducting meeting.
- Conduct the committee meeting.
- Approve committee correspondence and reports.
- Supervise the preparation of meeting minutes.
- Duties of the Vice-Chairman:
 - In the absence of the chair, assume the duties of the chair.
 - Perform other duties as directed by the chair.
- Election of Chairman and Vice-Chairman

A new Chairman or Vice-Chairman will be elected during the monthly committee meeting before the month in which the incumbent's term expires. If the Chairman or Vice-Chairman leaves office before the term expires, an election will be held during the next scheduled safety-committee meeting; the elected officer will serve for the remainder of the term.

- Terms of Service

The Chairman and Vice-Chairman will each serve a one-year term.

Training

New representatives will receive training in safety-committee functions, hazard identification, and near misses.

Meetings

The committee will meet the first Monday of each month, except when the committee conducts monthly workplace safety inspections.

- Attendance and Alternates

Each representative will attend regularly scheduled committee meetings and participate in monthly workplace inspections and other committee activities. Any representative unable to attend a meeting will appoint an alternate and inform the Chairman before the meeting. An alternate attending a meeting on behalf of a regular representative will be a voting representative for that meeting.

- Agenda

The agenda will prescribe the order in which the committee conducts its business. The agenda will also include the following when applicable:

- A review of new safety and health concerns.
- A status report of employee's safety and health concerns and suggestions under review.
- A review of all workplace near misses, accidents, illness, or deaths occurring since the last committee meeting.

- Minutes

Minutes will be recorded at each committee meeting and distributed to all employees. The committee will submit a copy of the minutes to the personnel office. The office will retain the copy for three years. The minutes will include all reports, evaluations and recommendations of the committee. The minutes will also identify representatives who attended monthly meeting and representatives who were absent.

- Voting Quorum

Five voting representatives constitute a quorum. A majority vote of attending representatives is required to approve all safety-committee decisions. The committee will forward issues not resolved by majority vote to management for resolution. Final approval will be determined by the PM, Ray D'Hollander.

Employee Involvement

The employee SH&E committee will encourage employees to identify workplace, health and safety hazards. Employees will present concerns raised by employees or contractors to the committee in writing. The committee will review new concerns at the next regularly scheduled monthly meeting.

- Safety Log

The committee will maintain a log of all employee concerns, including the date received, recommendations to management and the date it resolved the concern.

- Response

The committee will respond to employee concerns in writing. It will work with management to resolve them. The committee will present written recommendations for resolving concerns to management. Within 60 days of receipt of written recommendations, management will respond in writing to the committee indicating acceptance, rejection or modification of the recommendations.

- Workplace Inspections

The committee will conduct monthly workplace inspections of all company facilities. The ESHARP monthly office inspection protocol will be followed for inspection of job trailers and mobile offices. Inspections will be on the requisite inspection form.

- Written Report

The committee will use the Monthly Office ESHARP inspection form found in IndustrySafe to document deficiencies found during monthly facility inspections and track corrective actions related to those deficiencies.

Communication, Consultation, and Awareness Campaigns

- Weekly all-hands meetings will be used as the forum for informing important SH&E-related information to the project stakeholders. Lessons learned, observations, identification of new site personnel, one-week task look-ahead, employee recognition, and project accolades will be shared.
- SH&E campaigns will be shared by the SH&E Manager to disseminate at the all hands meetings. This may include handouts or pledges.
- Rewards and Recognition

Employees and non-Parsons project staff will be recognized for performing work safely and encouraging a safety-conscious mindset on the project. Specifically, workers will be encouraged to formally submit near-misses and implement Take-5 moments. Recognition of workers displaying these safe work practices will be rewarded with hi-visibility long sleeve shirts designed for the OU-1 RD team.

Enforcement and Discipline

The PM has established a fair and consistent project policy for the disciplinary process related to employees and project stakeholders who are unable to abide by the project's SH&E expectations.

Continual improvement is an essential aspect of Parsons SH&E core value. The PM, supervisors, and project stakeholders shall identify and immediately address unacceptable actions and behaviors. All members of the project team shall be on the lookout continually for any conditions, actions, or behaviors that increase the risk

of injury, illness, property damage, or environmental insult. The first step to addressing at-risk conditions, actions, and behaviors is through personal communication, coaching, or mentoring.

Most enforcement and disciplinary activities are informal – peers counseling peers and supervisors counseling subordinates. If an employee is unable or unwilling to improve his or her SH&E performance or change at-risk behaviors, the PM, the worker's direct supervisor, and a Talent Management professional will administer formal enforcement and disciplinary action. Workers who intentionally create or contribute to situations that are immediately dangerous to life, health, the environment, or the security of the project are subject to immediate termination. The PM and the project's assigned talent management professionals ensure that enforcement and discipline matters are handled fairly and fully consistent with applicable contracts, collective bargaining agreements, local, regional, and national laws and regulations, and the Parsons SH&E core value.

Substance Abuse Identification and Testing

Parsons is committed to providing a drug-free and healthful work environment. In collaboration with the Talent Management professionals assigned to the project, the PM has established a fair and reliable substance abuse and identification and testing program.

Without exception, employees, contractor workers, and other project stakeholders shall be fit for duty while conducting work on behalf of Parsons, while on Parsons work sites, and while driving.

Pre-employment / pre-appointment screenings

- Offers of employment are contingent upon successful completion of substance abuse screening, regardless of employment category.

For-cause screenings

- A Parsons employee who is involved in any type of incident while operating a company or fleet vehicle must be screened for the use of intoxicating substances within four hours of the incident.
- A Parsons employee who is involved in an incident associated with powered machinery or equipment or while working on a high-risk site must be screened for the use of intoxicating substances within four hours of the incident.
- A Parsons employee who is involved in an incident involving property damage or an injury may be screened for the use of intoxicating substances.

If an employee is involved in accident while operating a Parsons-owned or leased vehicle during business hours 6am PST to 5pm PST (7am CST and 7pm CST):

- The employee must immediately contact their Manager. Employee will be required to take a drug and alcohol test within four hours.
- The Manager must contact People Central (Parsons' human resources equivalent) by logging a ticket with Concierge (Parsons personnel reporting system). The following points must be provided in the Description field:
 - Employee name
 - Cell phone number
 - Current zip code/location of accident
 - Date of accident
- Manager must contact People Central at: 1-888-288-5522 to alert them of accident and ensure the Concierge ticket was received.
- People Central will search the Accurate Background database for the nearest testing facility to the current zip code provided.

- People Central will provide order confirmation to the Project Manager and employee. Confirmation will include:
 - Order number
 - Testing facility address
 - Facility phone number
- If the Field Project Manager and employee are not near a computer or do not have a device with email functionality, People Central will provide the order confirmation number and site information via phone. The employee cannot drive to the testing facility. The employee **MUST** be driven to the testing facility by either their Project Manager or another employee or call a taxi/Lyft/Uber.
- The employee, Field Project Manager and PM must follow Parsons Risk Management Accident Reporting procedures.

If the employee is involved in accident while operating a Parsons-owned or leased vehicle after business hours:

- The employee must promptly notify their Project Manager to let the Manager know they will be calling EMSI Fleet Program Post Accident Testing Scheduling Center for post-accident drug and alcohol testing. The glove compartment of the fleet vehicle should have a chain-of-custody form with the after-hours instructions.
- The employee must call the EMSI Fleet Program Post-Accident Testing Scheduling Center at 1-866-236-3674 opt 1, then 6. The scheduling center is open 24/7. Provide the Parsons Fleet Program EMSI Account #282700285.
- The employee will advise the scheduling center that s/he is requesting a call-out collection. Depending on the location and other factors, the call-out technician may meet the employee at their current location or meet at an agreed upon location.
- The call center may need the employee to call back with an estimated time of arrival (ETA) or confirmation details, so the employee must have a phone number available where they can be reached.
- If the EMSI Fleet Program Post-Accident Testing Technician requires that the employee meet at another specified location, the employee should not drive themselves to the meeting point. The employee **MUST** be driven to the meeting point by either their PM or another employee or call a taxi/Lyft/Uber.
- If vehicle does not have chain-of-custody forms, the employee should let the call-out technician know. The technician can bring chain-of-custody forms with them to the meeting point.
 - Employee must present their photo ID.
 - The technician will give the employee a copy of the chain-of-custody form.
 - The employee must send a copy of the form to their PM by either scanning or taking a picture and sending it via email/text.
 - The PM must then notify/send a copy of the chain-of-custody form by logging a ticket with Concierge. The ticket will route to People Central.
 - If the results come back as “does not meet requirements,” People Central will contact the PM and Talent Leader for further action.

Appendix A – Legal Compliance Register

Appendix A
Legal Compliance Register
West Lake Landfill Project
Content Revision Date: 2/5/2020

Item #	Description / identity of relevant SH&E risk	Identity / citation of related legal compliance obligation	How does one gain access to the text of this legal compliance obligation?	Remarks
1	General Safety & Health	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.20 • US ACE EM 385-1-1 01.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
2	Safety Training	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.21 • US ACE EM 385-1-1 01.B.01 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
3	First Aid and Medical	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.23 • US OSHA 29 CFR 1926.50 • US ACE EM 385-1-1 03.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
4	Fire Protection and Prevention	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.24 • US OSHA 29 CFR 1926.150-155 • US OSHA 29 CFR 1926.352 • US ACE EM 385-1-1 09.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
5	Housekeeping	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.25 • US ACE EM 385-1-1 14.C 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
6	Sanitation	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.27 • US OSHA 29 CFR 1926.51 • US ACE EM 385-1-1 02.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
7	Personal Protective Equipment	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.28 • US OSHA 29 CFR 1926.95-98 • US OSHA 29 CFR 1926.100-107 • US ACE EM 385-1-1 05.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
8	Emergency Employee Action Plans	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.35 • US ACE EM 385-1-1 01.E 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
9	Noise Exposure	<ul style="list-style-type: none"> • US OSHA 29 CFR 1910.95 • US OSHA 29 CFR 1926.52 • US ACE EM 385-1-1 05.C 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
10	Gases, Vapors, Dusts and Mists	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.55 	<ul style="list-style-type: none"> • www.osha.gov 	
11	Hazard Communication	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.59 • US ACE EM 385-1-1 1.B.06 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
12	Hazardous Waste Operations and Emergency Response	<ul style="list-style-type: none"> • US OSHA 29 CFR 1910.120 • US OSHA 29 CFR 1926.65 • US ACE EM 385-1-1 28.A • 42 USC §9603 • 42 USC §11004 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx • https://www.govinfo.gov/app/details/USCODE-2010-title42 	
13	Accident prevention signs and tags	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.200 • US ACE EM 385-1-1 08.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
14	Signaling	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.201 • US ACE EM 385-1-1 08.B 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
15	Barricades	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.202 	<ul style="list-style-type: none"> • www.osha.gov 	
16	Material Storage	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.250 • US ACE EM 385-1-1 14.B 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
17	Waste Disposal	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.252 • US ACE EM 385-1-1 14.D • US 40 CFR §300.440 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	

		<ul style="list-style-type: none"> • US 40 CFR §261.4(e) • US 42 USC §9621(d)(3) 	<ul style="list-style-type: none"> • https://www.govinfo.gov/app/details/USCODE-2010-title42 • https://www.govinfo.gov/app/details/CFR-2008-title40-vol27/ 	
18	Tools	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.300-307 • US ACE EM 385-1-1 13.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
19	Motor Vehicles, Mechanized Equipment	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.600-603 • US ACE EM 385-1-1 18.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
20	Site Clearing	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.604 • US ACE EM 385-1-1 31.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
21	Excavations	<ul style="list-style-type: none"> • US OSHA 29 CFR 1926.650-652 • US ACE EM 385-1-1 25.A 	<ul style="list-style-type: none"> • www.osha.gov • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
22	Internal Traffic Control	<ul style="list-style-type: none"> • US ACE EM 385-1-1 8.D 	<ul style="list-style-type: none"> • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
23	Traffic Movement Restriction Times	<ul style="list-style-type: none"> • US ACE EM 385-1-1 8.C 	<ul style="list-style-type: none"> • www.usace.army.mil/SafetyandOccupationalHealth.aspx 	
24	Waste Transportation and Handling	<ul style="list-style-type: none"> • US 40 CFR part 262, subpart E • US 40 CFR section 263.20 	<ul style="list-style-type: none"> • www.dot.gov 	
25	Radiation Safety Training	<ul style="list-style-type: none"> • US OSHA 10 CFR 20.1101 • US OSHA 10 CFR 20.1201 • US OSHA 10 CFR 20.1208 • US OSHA 10 CFR 20.1301 • LAC 33 XV SS 1499 Appendices A&B 	<ul style="list-style-type: none"> • www.osha.gov • Deq.louisiana.gov/assets/docs/Legal_Affairs/ERC 	
26	Nuclear Gauge Safety Trainng	<ul style="list-style-type: none"> • 32 IL 330.220 (b) • US DOT 49 CFR 172.704 	<ul style="list-style-type: none"> • www.iema.illinois.gov • www.transportation.gov 	

Appendix B – Risk Register

Appendix B West Lake Landfill Project Risk Register

		PROBABILITY			
SEVERITY	Ca	H	H	M	
	Cr	C	H	M	L
	M	C	H	M	L
	N	C	H	M	L
	F	L	O	S	U

		PROBABILITY			
SEVERITY	Ca	H	H	M	
	Cr	C	H	M	L
	M	C	H	M	L
	N	C	H	M	L
	F	L	O	S	U

Activity	HOC Confirmation	Hazard Identification	At Risk	Pre-Risk Mgt Evaluation Matrix			Pre-Risk Mgt Treatment	Risk Management & Control – Safety & Health		Risk Management & Control – Environmental			Responsible Person	Cost Contingency	Post-Risk Mgt Evaluation Matrix			Residual Risk Action
				Probability	Severity	RAC (Pre-Risk)		Engineering/Administrative Controls	PPE	Waste Management	Engineering/Administrative Controls	Site Condition Controls			Probability	Severity	RAC (Post-Risk)	
Drilling Oversight	Yes	Radiation exposure, Heat/Cold Stress Injuries, Biological Hazards, Slips Trips Falls, Driving on site, underground and overhead utilities, spilled fluids, struck by, pinch points, back injury	Site personnel	Occasional	Catastrophic	HIGH	Reduce	Monitor radiation/air quality, wear Tyvek when sampling, carry respirator, Activity Hazard Analysis, follow procedures, keep distance from drill when possible	Level D - Modified to include Tyvek	Used clothing and other investigation-derived waste. Soil cuttings. Waste water from decontamination. Waste to be handled at the facility.	Permits, Procedures, Regulatory Requirements, Training/education, Checklists/audits, Instructions, personal radiation monitoring	Sitewide air monitoring	Site Supervisor	Covered in Budget	Unlikely	Catastrophic	MODERATE	NA
Driving	Yes		Site personnel	Seldom	Catastrophic	HIGH	Reduce	Follow procedures, seat belts, no cellular activity, no distracted or fatigued driving	Level D	NA	NA	NA	Site personnel	None	Unlikely	Catastrophic	MODERATE	
Hand Augering	Yes	Ergonomic Hazards, Hand injuries, Slips Trips Falls, heat stress	Site personnel	Occasional	Critical	HIGH	Reduce	Use correct auger for the job.	Level D - Modified to include Tyvek	Used clothing and other investigation-derived waste. Soil cuttings. Waste water from decontamination. Waste to be handled at the facility.	Permits, Procedures, Regulatory Requirements, Training/education, Checklists/audits, Instructions, personal radiation monitoring	Sitewide air and weather monitoring	Site Supervisor	Covered in Budget	Unlikely	Critical	LOW	NA
Inspections, Surveying, and Monitoring	Yes	Radiation exposure, Heat/Cold Stress Injuries, Biological Hazards, Slips Trips Falls, Driving on site	Site personnel	Occasional	Catastrophic	HIGH	Reduce	Monitor radiation/air quality. Carry respirator. Review AHAs and driving conditions. Wear sun screen or protective clothing.	Level D	NA	Permits, Procedures, Regulatory Requirements, Training/education, Checklists/audits, Instructions	Sitewide air monitoring	Site Supervisor	Covered in Budget	Unlikely	Catastrophic	MODERATE	NA
Groundwater Sampling	Yes	Radiation exposure, Inhalation and contact with hazardous substances, Struck by, back injuries, Heat/Cold Stress Injuries, Biological Hazards, vehicle traffic	Site personnel	Occasional	Catastrophic	HIGH	Reduce	Monitor radiation/air quality. Wear Tyvek and other disposable layers when sampling. Carry respirator. Review AHAs and driving conditions. Wear sun screen or protective clothing.	Level D - Modified to include Tyvek	Used clothing and other investigation-derived waste. Waste water from purging. Waste to be handled at the facility.	Permits, Procedures, Regulatory Requirements, Training/education, Checklists/audits, Instructions, personal radiation monitoring	Sitewide air monitoring	Site Supervisor	Covered in Budget	Unlikely	Catastrophic	MODERATE	NA

Appendix C – Activity Hazard Analysis (AHA)

Work Operations – Barge or Boat

Activity Hazard Analysis (AHA)

Activity/Work Task: Work Operations – Barge or Boat	Overall Risk Assessment Code (RAC) (Use highest code)	Moderate				
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix					
Job Number: 451662	Severity	Probability				
Date Prepared: 3/23/2020 Date Revised:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%;">Frequent</td> <td style="width: 16.6%;">Likely</td> <td style="width: 16.6%;">Occasional</td> <td style="width: 16.6%;">Seldom</td> <td style="width: 16.6%;">Unlikely</td> </tr> </table>	Frequent	Likely	Occasional	Seldom
Frequent	Likely	Occasional	Seldom	Unlikely		
Prepared by (Name/Title): Dale R. Dolph, CHST	Catastrophic	E E H H M				
Reviewed by (Name/Title): Darrell Pruitt, CSP	Critical	E H H M L				
	Marginal	H M M L L				
	Negligible	M L L L L				
Employer/GBU: INF	Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.					
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Tyvek coverings for all body parts, excluding head and hands. Steel toed boots Safety glasses High Visibility Safety Vest Nitrile gloves when handling site soil or sediment Hard hat Hearing protection as needed USCG Approved Personal Floatation Device (PFD) for all on or near water operation Personal radiation dosimeter 	P “Probability” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	RAC Chart <table style="width: 100%; border-collapse: collapse;"> <tr style="background-color: red; color: white; text-align: center;"><td>E = Extremely High Risk</td></tr> <tr style="background-color: orange; text-align: center;"><td>H = High Risk</td></tr> <tr style="background-color: yellow; text-align: center;"><td>M = Moderate Risk</td></tr> <tr style="background-color: green; text-align: center;"><td>L = Low Risk</td></tr> </table>	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
	E = Extremely High Risk					
	H = High Risk					
	M = Moderate Risk					
L = Low Risk						
S “Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible						
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.						

Job Steps	Hazards	Controls	P	S	RAC
1. Boarding and De-boarding Boat	1a. Slips, Trips & Falls	1a. Use proper footing and handrails for boarding and de-boarding of boat. Be aware of any objects on the boat and dock that may present a tripping hazard. 1a. Assure that boat is firmly grounded before attempting to exit boat. Assure ground is firm before stepping out of boat.			M

Work Operations – Barge or Boat

Job Steps	Hazards	Controls	P	S	RAC
	1b. Musculoskeletal Disorders (MSD)	1a. Check for wet or icy surfaces before stepping into or out of boat. 1a. Maintain three points of contact when boarding or de-boarding boat. 1a. Do not board or de-board boat while carrying a load. Always transfer loads from barge or boat. 1a. Always place foot on flat, stable surfaces when boarding or de-boarding. Step to center of boat when entering. Never step on sidewalls. 1a&b. Never carry a load that blocks your vision of the pathway in front of you. 1b. Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. 1b. Obey sensible lifting limits (40-lb Maximum per person manual lifting).			
2. Boating Operations	2a. Drowning	2a. Personal Flotation Device (PFD) 2a. Employees working over or near water, where the danger of drowning exists, shall be provided with U.S. Coast Guard-approved life jacket or buoyant work vests. 2a. PFD types must be approved by the United States Coast Guard (USCG). 2a. Rescue line & Ring Buoy 2a. A rescue ring buoy, with 90 feet of line must be kept both on shore in close proximity to the actual work site in order to be accessed in case of an emergency as well as inside the boat used for work operations. 2a. Shoreline Spotter 2a. All on water work activity will be conducted with a shoreline spotter/support present. 2a. The shoreline spotter will be present in the immediate area at all times when on the water work is being performed. That individual must be specifically designated to respond to water emergencies.	U	Ca	M

Work Operations – Barge or Boat

Job Steps	Hazards	Controls	P	S	RAC
	<p>2b. Hypothermia</p> <p>2c. Fire</p>	<p>2b. If water temperature is below 50 deg F, survival suits/jackets are required to be worn by all personnel on board for all on the water work activities.</p> <p>2b. Provisions will be made for rescue and or emergency procedures prior to any on the water activity each day.</p> <p>2b. If a person falls in the water, use flotation device and retrieval rope to assist the person. Once onboard, move person to shore immediately and allow to dry off and warm up. Stand by to assist the victim and observe for signs of hypothermia.</p> <p>2c. Ensure an inspected A/B/C Fire extinguisher of appropriate size is present in the boat and on shore.</p>			
3. Severe Weather/Lightning	<p>3a. Electrocutation/Exposure</p> <p>3b. Changing conditions</p>	<p>3a. Weather reports must be checked prior to work each day.</p> <p>3a. Both shore support and onboard personnel must have access to severe weather alerts via radio or phone.</p> <p>3a. If lightning is observed or thunder is heard, suspend work until 30 minutes have passed without the occurrence of lightning/thunder. Allow time to secure equipment from potential heavy rain, heavy wind, and hail and seek proper cover.</p> <p>3b. If conditions encountered in the field are not what is expected ANY TEAM MEMBER MAY STOP WORK to ensure the team and the sites safety.</p>			M
Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements			
<ul style="list-style-type: none"> • Level D PPE Minimum. Task Dependent • Safety eyewear • Proper Gloves (Insulated, leather palm, cut resistant, chemical resistant) • Ring Buoy & Rope, Safety belt / lifeline, Throw line, • PFDs • Hearing protection as needed 	<ul style="list-style-type: none"> • The boat will be operated by experienced, authorized personnel only. This may include training such as boating safety course, navigation regulations and emergency procedures as required. • Ensure that the boat is launched and retrieved from the water at a safe entry point (e.g., Avoid 	<ul style="list-style-type: none"> • The Competent Person (Captain/Operator) will ensure that the vessel is inspected for operational readiness prior to any on the water operations • All water craft will be properly registered for use in waterways in accordance with local, state and federal requirements. • Ensure appropriate safety equipment is present in the boat, i.e. air horn, signal device, full and inspected A/B/C fire extinguisher prior to launch. • For heat/cold stress procedures see heat/cold stress AHA. 			

Work Operations – Barge or Boat

Job Steps	Hazards	Controls	P	S	RAC
<ul style="list-style-type: none"> • Personal dosimeter as required • Repellent, Sunscreen, Potable Water • Rain Gear • Fire Extinguishers, • Communication Devices. • 40-Hour HAZWOPER/8-Hour Refresher 	entry/exit on steep slopes, slick surfaces, thick vegetation, etc.)	<ul style="list-style-type: none"> • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Radiological Free-Release Survey

Activity Hazard Analysis (AHA)

Activity/Work Task: Cleaning tires and performing radiological free release survey of each.	Overall Risk Assessment Code (RAC) (Use highest code)	M					
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix						
Job Number: 451662	Severity	Probability					
Date Prepared: 7/9/2020 Date Revised:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Frequent</td> <td style="width: 15%;">Likely</td> <td style="width: 15%;">Occasional</td> <td style="width: 15%;">Seldom</td> <td style="width: 15%;">Unlikely</td> </tr> </table>	Frequent	Likely	Occasional	Seldom	Unlikely
Frequent	Likely	Occasional	Seldom	Unlikely			
Prepared by (Name/Title): P. Scharfschwerdt; Sr. Geologist	Catastrophic	E E H H M					
Reviewed by (Name/Title): Darrell Pruitt	Critical	E H H M L					
	Marginal	H M M L L					
Employer/GBU: INF	Negligible	M L L L L					
	<p>Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.</p> <p>P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</p> <p>S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.</p>						
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Steel toed boots Safety glasses High Visibility Safety Vest Nitrile gloves when handling site soil or sediment Hard hat Personal radiation dosimeter 		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">RAC Chart</td> </tr> <tr> <td style="text-align: center; background-color: red;">E = Extremely High Risk</td> </tr> <tr> <td style="text-align: center; background-color: orange;">H = High Risk</td> </tr> <tr> <td style="text-align: center; background-color: yellow;">M = Moderate Risk</td> </tr> <tr> <td style="text-align: center; background-color: green;">L = Low Risk</td> </tr> </table>	RAC Chart	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
RAC Chart							
E = Extremely High Risk							
H = High Risk							
M = Moderate Risk							
L = Low Risk							

Job Steps	Hazards	Controls	P	S	RAC
1. Clear debris from tires, perform light dust suppression	1a. Slips, trips, falls 1b. Cuts/abrasions 1c. Heat stress 1d. Muscle strain 1e. Radiological Exposure	1a. Use eye protection (safety glasses w/ splash protection as needed) 1b. Suppress dust 1c. Double gloves 1d. Watch footing 1e. Use proper lifting techniques & ergonomics 1f. Contain overspray 1g. Ground electrical equipment 1h. Take breaks as necessary 1i. Frisk personnel/equip out of area	S	M	L

Radiological Free-Release Survey

Job Steps	Hazards	Controls	P	S	RAC
2. Perform radiological free release survey of each tire	2a. Muscle strain 2b. Heat Stress 2c. Radiological exposure	2a. Use proper lifting techniques & ergonomics 2b. Document/track samples and survey results by assigning tire reference numbers	S	M	L
3. Stockpile release tires in designated location for removal from area	3a. Muscle strain 3b. Heat stress 3c. Radiological exposure	3a. Use proper lifting techniques & ergonomics 3b. Document/track samples and survey results by assigning tire reference numbers.	O	M	M
Equipment to be Used	Safety Items Required	Inspection Requirements			
<ul style="list-style-type: none"> • Hand tools • Air sampling equipment • Fan • Shop Vac • Sprayer • Radiological Detectors 	<ul style="list-style-type: none"> • 4-gas meter • TLD (1 per individual) • Stationary air sampler • Fire Extinguisher • 1st Aid Kit/Eyewash • Extra gloves, booties, and duct tape • Drinking water (stored outside controlled area) or in designated area(s) (i.e., tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> • Cell phone use for emergencies only. Evacuation route and directions to hospital are posted in each job trailer and common area, with copies available to be kept in project vehicles. <li style="color: red;">• For heat/cold stress procedures see heat/cold stress AHA. • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Ponar Dredge Use

Activity Hazard Analysis (AHA)

Activity/Work Task: Ponar Dredge Use		Overall Risk Assessment Code (RAC) (Use highest code)				Moderate		
Project Location: West Lake Landfill		Risk Assessment Code (RAC) Matrix						
Job Number: 451662								
Date Prepared: 3/23/2020	Date Revised:	Severity	Probability					
			Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name/Title): Dale R. Dolph, CHST			Catastrophic	E	E	H	H	M
Reviewed by (Name/Title): Darrell Pruitt			Critical	E	H	H	M	L
			Marginal	H	M	M	L	L
Employer/GBU: INF		Negligible	M	L	L	L	L	
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Tyvek coverings for all body parts, excluding head and hands. Steel toed boots Safety glasses High Visibility Safety Vest Leather work gloves while handling sampler and rope/line Nitrile gloves when handling site soil or sediment Hard hat Hearing protection as needed USCG Approved Personal Floatation Device (PFD) for all on or near water operation Personal radiation dosimeter 		Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.						
		P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.						
		S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible						
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.						
		RAC Chart						
		E = Extremely High Risk						
		H = High Risk						
		M = Moderate Risk						
		L = Low Risk						

Job Steps	Hazards	Controls	P	S	RAC
1. Boating Operations	1a. Hazards associated with on the water work activities	1a. Review the AHA "Working on Barge or Boat"	U	Ca	M
2. Use of Ponar Dredge	2a. Pinch points/lacerations/abrasions	2a. Always utilize leather gloves when setting Pinch-pin on dredge. Ensure pin is inserted with the flat portion down. Be careful not to			

Ponar Dredge Use

Job Steps	Hazards	Controls	P	S	RAC
<p>3. Collection of sediments</p>	<p>2b. Musculoskeletal Disorders (MSD)</p> <p>2c. Boat Tip over/Falling out of boat</p> <p>3a. Chemical exposure to sediments</p>	<p>place hands or fingers in tripping mechanism pinch points.</p> <p>2a. Use gloves when handling line to lower the sampler through the water column</p> <p>2b. Observe proper lifting techniques – lift with arms, elbows in, and keep back straight. Use team lift to share the load. Avoid awkward body position. Lift the dredge to the surface in a slow even manner.</p> <p>2b. Consider using mechanical means to lift if the weight is awkward or the weight is greater than 40 pounds individually or 80 pounds for team lifting</p> <p>2b. Avoid prolonged bending, awkward positions, and repetitive movements.</p> <p>2c. Always remain seated when retrieving dredge, draining water from top of the sampler or emptying the contents of the dredge.</p> <p>3a. If required, monitor the breathing zone with the appropriate air monitoring device as per the PSHEP. Follow Action Levels per PSHEP COCs Table.</p> <p>3a. Avoid all skin and clothing contact with lake sediments.</p> <p>3a. If exposure to contaminated materials occurs, promptly wash contaminated skin using soap or mild detergent and water</p> <p>3a. Ensure an eye wash station is located close by or have a portable eye wash bottle located on the boat. All persons involved in the sampling activity will wear the appropriate eye protection at all times.</p> <p>3a. Wash sediments from boat deck back into the lake following each sampling location.</p>			

Ponar Dredge Use

Job Steps	Hazards	Controls	P	S	RAC
	3b. Chemical exposure during decontamination	3b. If decontamination of the sampling dredge with chemicals containing physical or health hazards are required, ensure the SDS is reviewed and ensure adequate PPE is used and 1 st Aid measures are in place. 3b. Ensure an eye wash station is located close by or have a portable eye wash bottle located on the boat.			
Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements			
<ul style="list-style-type: none"> • Level D PPE Minimum. Task Dependent • Safety eyewear • Proper Gloves (Insulated, leather palm, cut resistant, chemical resistant) • Ring Buoy & Rope, Safety belt / lifeline. Throw line, • PFDs • Hearing protection as needed • Personal dosimeter as required • Repellent, Sunscreen, Potable Water • Rain Gear • Fire Extinguishers, • Communication Devices • 40 Hour HAZWOPER/8-Hour Refresher 	<ul style="list-style-type: none"> • The boat will be operated by experienced, authorized personnel only. This may include training such as boating safety course, navigation regulations and emergency procedures as required. • Ensure that the boat is launched and retrieved from the water at a safe entry point (e.g. Avoid entry/exit on steep slopes, slick surfaces, thick vegetation, etc.) 	<ul style="list-style-type: none"> • The Competent Person (Captain/Operator) will ensure that the vessel is inspected for operational readiness prior to any on the water operations • All waterer craft will be properly registered for use in waterways in accordance with local, state and federal requirements. • Ensure appropriate safety equipment is present in the boat, i.e. air horn, signal device, full and inspected A/B/C fire extinguisher prior to launch. • For heat/cold stress procedures see heat/cold stress AHA. • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Inspections Surveying and Monitoring

Activity Hazard Analysis (AHA)

Activity/Work Task: Inspections, Surveying, and Monitoring	Overall Risk Assessment Code (RAC) (Use highest code)	Moderate									
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix										
Job Number: 451662	Severity	Probability									
Date Prepared: 2/4/2020 Date Revised:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%;">Frequent</td> <td style="width: 16.6%;">Likely</td> <td style="width: 16.6%;">Occasional</td> <td style="width: 16.6%;">Seldom</td> <td style="width: 16.6%;">Unlikely</td> </tr> </table>	Frequent	Likely	Occasional	Seldom	Unlikely				
Frequent	Likely	Occasional	Seldom	Unlikely							
Prepared by (Name/Title): Erik Powers Senior Scientist	Catastrophic	E	E	H	H	M					
Reviewed by (Name/Title): Darrell Pruitt	Critical	E	H	H	M	L					
	Marginal	H	M	M	L	L					
	Negligible	M	L	L	L	L					
Employer/GBU: INF	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">RAC Chart</td> </tr> <tr> <td style="text-align: center; background-color: red;">E = Extremely High Risk</td> </tr> <tr> <td style="text-align: center; background-color: orange;">H = High Risk</td> </tr> <tr> <td style="text-align: center; background-color: yellow;">M = Moderate Risk</td> </tr> <tr> <td style="text-align: center; background-color: green;">L = Low Risk</td> </tr> </table>	RAC Chart	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
RAC Chart											
E = Extremely High Risk											
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M = Moderate Risk											
L = Low Risk											
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Steel toed boots Safety glasses High Visibility Safety Vest Nitrile gloves when handling site soil or sediment Hard hat Personal radiation dosimeter 	P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.										
	S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible										
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.										

Job Steps	Hazards	Controls	P	S	RAC
1. Conduct Pre-mobilization meetings	1a. Overlook potential hazards; unprepared in emergencies	1a. Develop specific controls for each potential hazard. 1a. Verify field conditions match work instructions. 1a. Assign workers qualified for the task. 1a. Check in with the Radiation Safety Officer and follow recommended procedures for radiation monitoring/mitigation. 1a. Select appropriate Personal Protective Equipment (PPE) based on task. 1a. Know evacuation assembly points and routes. 1a. Know and distribute emergency phone numbers and procedures. 1a. Be familiar with applicable SHEPs.	U	C	L

Inspections Surveying and Monitoring

Job Steps	Hazards	Controls	P	S	RAC
		1a. Team leaders/foremen will be able to account for working personnel at all times.			
2. Equipment & Tool Usage	2a. Ergonomic Hazards 2b. Cuts, punctures, electrical shock by faulty tool or cord 2c. Burns, fire 2d. Airborne dust/particulates inhalation and in eyes 2e. Eye, feet, hands getting cut or mashed 2f. Thermal stress – heat and cold injuries	2a. Reduce bending, twisting, kneeling, using alternating work, rotating workers and periodic stretching break to reduce static or awkward postures. 2a. Use team lifting and lifting aids to minimize lifting weights over 25-lbs above the shoulders, below the knees, or at arm length. 2b. All equipment and tools will be used and maintained in accordance with manufacturer’s instructions and recommendations, and will be only used for the purpose for which designed. 2b. Portable power tools will be in good repair and with all required safety devices installed and properly adjusted. Portable power tools having defects that will impair their strength or render them unsafe will be removed from service. 2b. Portable power tools with guards will be equipped with such guards; ensure guards are in place and operational at pinch and nip points and control loose clothing, gloves, jewelry and hair. 2b. Ensure all portable power tools will use ground fault circuit interrupters. Check cords for cuts and frays. 2b. Secure all equipment properly when not in use. 2c. Keep appropriate fire extinguishers on hand. 2c. Know procedures and escape routes in case of rapidly moving brush fires. 2d. Ensure local ventilation/engineering controls are in place. 2d. Monitor exposure and area; upgrade to respiratory protection if needed. 2d. Use safety goggles. 2e. Eye/Face Protection – Safety glasses with side shields. 2e. Appropriate work gloves and footwear as required. 2e. Caution near moving parts. 2f. Train workers/supervisors in heat stress, cold stress/hypothermia recognition, prevention, and control. 2f. Use of WBGT (weather station) readings when working in extreme temperatures. 2f. Provide water/fluids. Provide adjacent thermal recovery (cool down/warm up) area.	U	Ca	M

Inspections Surveying and Monitoring

Job Steps	Hazards	Controls	P	S	RAC
3. Vehicle Operations (Automobiles, Trucks and Forklifts).	<p>3a. Accidents while driving, loading, unloading equipment and material</p> <p>3b. Accidents due to unfamiliar vehicles, navigating in unfamiliar areas, driving while fatigued.</p>	<p>3a. Vehicle Operators will follow and adhered to all local, state or foreign rules of Safe Vehicle Operations.</p> <p>3a. Drivers will have a valid driver license.</p> <p>3a. All occupants will wear seat belts at all times. 3a. Employ defensive driving techniques.</p> <p>3a. Obey posted speed limits, traffic signals and signs, weight and height restrictions for any overweight or overweight vehicles, and common courtesy on the road.</p> <p>3a. Be aware of road conditions and hazards.</p> <p>3a. Use of cellular phones by vehicle operators while driving and during refueling operations is prohibited.</p> <p>3a. Secure unsteady or unbalanced loads in vehicles or on forklifts. Keep within load limit of equipment and know the weight of load.</p> <p>3a. Secure all heavy equipment vehicles when not in use (locks, chock blocks, de-energize, etc.).</p> <p>3b. Make adjustments to mirrors, seats, electronic controls, and steering wheel before driving vehicle.</p> <p>3b. Read and memorize directions prior to driving, use current maps. Do not attempt to read maps or directions while driving.</p> <p>3b. Be aware of local laws applicable to motor vehicle operation.</p> <p>3b. Get proper rest before travelling.</p>	U	C	M
4. Accessing/Working in Field	4a. Tripping, falling, dangerous wildlife	<p>4a. Awareness of potential slippery surfaces and tripping hazards.</p> <p>4a. Inform field coordinator or Site Safety Manager of any slip, trip, or fall hazards.</p> <p>4a. Use "buddy" system.</p> <p>4a. Be alert for snakes, bees, and diseased animals.</p>	U	C	L
Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements			
<ul style="list-style-type: none"> Level D PPE Minimum. Task Dependent Safety eyewear Proper Gloves (Insulated, leather palm, cut resistant, chemical resistant) Ring Buoy & Rope, Safety belt / lifeline. Throw line, 	<ul style="list-style-type: none"> The machinery will be operated by experienced, authorized personnel only. This may include training such as safety course, navigation regulations and emergency procedures as required. 	<ul style="list-style-type: none"> The Competent Person (Captain/Operator) will ensure that the vessel is inspected for operational readiness prior to any on the water operations All waterer craft will be properly registered for use in waterways in accordance with local, state and federal requirements. Ensure appropriate safety equipment is present in the boat, i.e. air horn, signal device, full and inspected A/B/C fire extinguisher prior to launch. 			

Inspections Surveying and Monitoring

Job Steps	Hazards	Controls	P	S	RAC
<ul style="list-style-type: none"> • PFDs • Hearing protection as needed • Personal dosimeter as required • Repellent, Sunscreen, Potable Water • Rain Gear • Fire Extinguishers, • Communication Devices. 	<ul style="list-style-type: none"> • Drinking water (stored outside controlled area) or in designated area(s) (i.e., tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. • For heat/cold stress procedures see heat/cold stress AHA. 			

Heat/Cold Stress

Activity Hazard Analysis (AHA)

Activity/Work Task: Work Operations – Heat/Cold Stress	Overall Risk Assessment Code (RAC) (Use highest code)	Moderate					
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix						
Job Number: 451662	Severity	Probability					
Date Prepared: 9/25/2020 Date Revised:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%;">Frequent</td> <td style="width: 16.6%;">Likely</td> <td style="width: 16.6%;">Occasional</td> <td style="width: 16.6%;">Seldom</td> <td style="width: 16.6%;">Unlikely</td> </tr> </table>	Frequent	Likely	Occasional	Seldom	Unlikely
Frequent	Likely	Occasional	Seldom	Unlikely			
Prepared by (Name/Title): Jesse Carr	Catastrophic	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: red;">E</td> <td style="width: 16.6%; background-color: red;">E</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: yellow;">M</td> </tr> </table>	E	E	H	H	M
E	E	H	H	M			
	Critical	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: red;">E</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: green;">L</td> </tr> </table>	E	H	H	M	L
E	H	H	M	L			
	Marginal	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: green;">L</td> <td style="width: 16.6%; background-color: green;">L</td> </tr> </table>	H	M	M	L	L
H	M	M	L	L			
Reviewed by (Name/Title): Darrell Pruitt	Negligible	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: green;">L</td> </tr> </table>	M	L	L	L	L
M	L	L	L	L			
Employer/GBU: INF	Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.						
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Tyvek coverings for all body parts, excluding head and hands. Steel toed boots Safety glasses High Visibility Safety Vest Nitrile gloves when handling site soil or sediment Hard hat Hearing protection as needed USCG Approved Personal Floatation Device (PFD) for all on or near water operation Personal radiation dosimeter 	P “Probability” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">RAC Chart</td> </tr> <tr> <td style="background-color: red; color: white; text-align: center;">E = Extremely High Risk</td> </tr> <tr> <td style="background-color: orange; text-align: center;">H = High Risk</td> </tr> <tr> <td style="background-color: yellow; text-align: center;">M = Moderate Risk</td> </tr> <tr> <td style="background-color: green; text-align: center;">L = Low Risk</td> </tr> </table>	RAC Chart	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
	RAC Chart						
	E = Extremely High Risk						
	H = High Risk						
M = Moderate Risk							
L = Low Risk							
S “Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible							
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.							

Job Steps	Hazards	Controls	P	S	RAC
1. Working in hot weather conditions	1a. Heat Stress	1a. Follow procedures for monitoring and prevention set forth in the Temperature Extremes document. 1b. Modify work/rest schedules according to monitoring requirements. 1c. Mandate work slowdowns as needed.			M

Heat/Cold Stress

Job Steps	Hazards	Controls	P	S	RAC
		1d. Rotate personnel. Alternate job functions to minimize overstress or overexertion. 1e. Add personnel to work teams 1f. Perform work during cooler hours of the day or at night if adequate lighting can be provided. 1g. Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.			
2. Working in cold weather conditions	2a. Cold Stress	2a. Follow procedures for monitoring and prevention set forth in the Temperature Extremes document. 2b. Use general or spot heating to increase temperature at the site. 2c. If work is being performed with bare hands for 10 or more minutes, keep the worker's hands warm by supplying warm air jets, radiant heaters, or contract warm heaters. 2d. If the air velocity at the site is increased by the wind, draft, or ventilation equipment, shield the work area. 2e. When fine work must be performed with bare hands for more than 10 to 20 minutes in an environment below 60.8oF (16oC), establish a means for keeping workers' hands warm. 2f. At temperatures below 40oF, cover metal handles of tools and control bars with thermal insulation. 2g. When necessary, substitute, isolate, relocate, or redesign equipment and processes to reduce the cold stress. 2h. Use power tools, hoists, cranes, and lifting aids to reduce the metabolic workload. 2i. If work is performed continuously in an equivalent chill temperature of 30oF or below, supply heated warming shelters such as tents, cabins, automobiles, or trucks and encourage workers to use them. 2j. Allow frequent rest periods in warm environments to prevent cold stress disorders 2k. Allow workers to pace themselves and take extra work breaks when needed. 2l. Schedule the coldest work for the warmest part of the day.	U	Ca	M

Heat/Cold Stress

Job Steps	Hazards	Controls	P	S	RAC
Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements			
<ul style="list-style-type: none"> • Level D PPE Minimum. Task Dependent • Safety eyewear • Proper Gloves (Insulated, leather palm, cut resistant, chemical resistant) • Ring Buoy & Rope, Safety belt / lifeline. Throw line, (if on water work) • PFDs (if on water work) • Hearing protection as needed • Personal dosimeter as required • Repellent, Sunscreen, Potable Water • Rain Gear • Fire Extinguishers, • Communication Devices. • 40-Hour HAZWOPER/8-Hour Refresher 		<ul style="list-style-type: none"> • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Hand Auger Use

Activity Hazard Analysis (AHA)

Activity/Work Task: Hand Auger Use		Overall Risk Assessment Code (RAC) (Use highest code)				Moderate	
Project Location: West Lake Landfill		Risk Assessment Code (RAC) Matrix					
Job Number: 451662							
Date Prepared: 3/26/2020	Date Revised: 7/10/20	Severity	Probability				
Prepared by (Name/Title): Dale R. Dolph, CHST			Frequent	Likely	Occasional	Seldom	Unlikely
Reviewed by (Name/Title): Darrell Pruitt			E	E	H	H	M
Employer/GBU: INF			E	H	H	M	L
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Tyvek coverings for all body parts, excluding head and hands. Steel toed boots Safety glasses High Visibility Safety Vest Leather work gloves while auger and tools Nitrile gloves when handling site soil or sediment Hard hat Hearing protection as needed Personal radiation dosimeter 			H	M	M	L	L
		M	L	L	L	L	
		<p>Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.</p> <p>P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</p> <p>S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.</p>					
		RAC Chart			E = Extremely High Risk		
					H = High Risk		
					M = Moderate Risk		
					L = Low Risk		

Job Steps	Hazards	Controls	P	S	RAC
1. Site Clearance	1a. Struck underground/aboveground utility – electrical shock, utility damage	1a. Parsons' policy requires that the project manager follow all local, state, and federal laws applying to intrusive subsurface work. 1b. Ensure that the Parsons Pre-Drilling/Subsurface Protocol and Checklist for Intrusive Fieldwork is completed prior to initiating fieldwork. This procedure is mandatory at all sites where drilling, augering, boring, or direct push (Geoprobe) activities will take place.	S	Cr	L

Hand Auger Use

Job Steps	Hazards	Controls	P	S	RAC
2. Soil sampling with hand auger	2a. Stress/Strain/Back injury from twisting hand auger 2b. Musculoskeletal Disorders (MSD) 2c. Hand lacerations/Pinch points	2a. Keep auger close to body when turning, keep back and shoulders straight. Spin auger 1/4 turn at a time to maintain elbow position as close to the body as possible. 2b. Do not attempt to over-exert auger if met with refusal, if necessary, manually remove rock/debris with gloved hand. Off set to new location if required. 2c. Observe proper lifting technique when removing auger from boring – lift with legs, elbows in, and keep back straight. Avoid awkward body position. Lift the auger from the boring in a slow even manner. 2d. Always wear a good pair of leather palmed gloves during all hand augering activity and keep fingers away from pinch points and possible sharp edges when connecting or disconnecting joints between auger sections. 2e. Stop advancing hand auger when handle reaches approx. 6 inches from ground surface to prevent scraping hands against the ground.	O	Ma	M
3. Collection of soil from augers	3a. Chemical exposure	3a. If required, monitor the breathing zone with the appropriate air monitoring device as per the PSHEP. Follow Action Levels per PSHEP COCs Table. 3b. Use nitrile or the proper chemical resistant gloves for handling recovered soil. 3c. If tapping hand auger handle on ground surface is required to removed soil cuttings, place a garbage bag or visquine on ground surface to prevent spread of contamination. 3d. Avoid all skin and clothing contact with recovered soil. 3e. If exposure to contaminated soil occurs, promptly wash contaminated skin using soap or mild detergent and water.	S	Ma	L
4. Decontamination of hand auger	4a. Chemical exposure during decontamination	4a. If decontamination of the hand auger with chemicals containing physical or health hazards are required, ensure the SDS is reviewed and ensure adequate PPE is used and 1 st Aid measures are in place. 4b. Use nitrile or the proper chemical resistant gloves for decontamination activity.	S	Ma	L

Hand Auger Use

Job Steps	Hazards	Controls	P	S	RAC
		4c. Ensure an eye wash station is located close by or have a portable eye wash bottle with sampling equipment.			
5. Use of hand tools for hole decommissioning	5a. Pinch points 5b. Muscle strains 5c. Repetitive motions	5a. Be aware of hand/foot placement 5b. Proper lifting technique, two people lifting if total weight exceeds 50 pounds 5c. Breaks/switching personnel as necessary	O	Ma	M
Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements			
<ul style="list-style-type: none"> Level D PPE Minimum. Task Dependent Safety eyewear Proper Gloves (Insulated, leather palm, cut resistant, chemical resistant) Hearing protection as needed Personal dosimeter as required Repellent, Sunscreen, Potable Water Fire Extinguishers Communication Devices 40-Hour HAZWOPWE/8-hour refresher 	<ul style="list-style-type: none"> Ensure personnel are trained on proper operation of monitoring equipment and understand action levels specified in the PSHEP. Drinking water (stored outside controlled area) or in designated area(s) (i.e., tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> Ensure that the Parsons Pre-Drilling/Subsurface Protocol and Checklist for Intrusive Fieldwork is completed prior to initiating fieldwork. This procedure is mandatory at all sites where drilling, augering, boring, or direct push (Geoprobe) activities will take place. Ensure air monitoring equipment is in proper working order and properly calibrated. If conditions encountered in the field are not what is expected, every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment. <li style="color: red;">For heat/cold stress procedures see heat/cold stress AHA. 			

Drilling, Casing Installation, and Borehole Abandonment Activities

Activity Hazard Analysis (AHA)

Activity/Work Task: Oversight/support of drilling, casing installation, and abandonment activities.	Overall Risk Assessment Code (RAC) (Use highest code)	Moderate					
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix						
Job Number: 451662	Severity	Probability					
Date Prepared: 7/9/2020 Date Revised:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Frequent</td> <td style="width: 15%;">Likely</td> <td style="width: 15%;">Occasional</td> <td style="width: 15%;">Seldom</td> <td style="width: 15%;">Unlikely</td> </tr> </table>	Frequent	Likely	Occasional	Seldom	Unlikely
Frequent	Likely	Occasional	Seldom	Unlikely			
Prepared by (Name/Title): P. Scharfschwerdt; Sr. Geologist	Catastrophic	E E H H M					
Reviewed by (Name/Title): Darrell Pruitt	Critical	E H H M L					
	Marginal	H M M L L					
Employer/GBU: INF	Negligible	M L L L L					
	<p>Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.</p> <p>P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</p> <p>S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.</p>						
<p>Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including:</p> <ul style="list-style-type: none"> Steel toed boots Hearing protection Safety glasses Reflective outerwear Protective/waterproof (as needed) clothing Disposable boot covers or rubber boots Nitrile gloves when handling site soil or sediment Hard hat Personal radiation dosimeter 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">RAC Chart</td> </tr> <tr> <td style="text-align: center; background-color: red; color: white;">E = Extremely High Risk</td> </tr> <tr> <td style="text-align: center; background-color: orange;">H = High Risk</td> </tr> <tr> <td style="text-align: center; background-color: yellow;">M = Moderate Risk</td> </tr> <tr> <td style="text-align: center; background-color: green;">L = Low Risk</td> </tr> </table>		RAC Chart	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
RAC Chart							
E = Extremely High Risk							
H = High Risk							
M = Moderate Risk							
L = Low Risk							

Job Steps	Hazards	Controls	P	S	RAC
1. Sonic and hollow stem auger drilling/sampling including rig setup, tool handling, drill stem advancement, sampling/removal of drilled materials, and moving the rig.	1a. Muscle strain 1b. Slips, trips, falls 1c. Crush hazards 1d. Electrocution 1e. Rig instability 1f. Biological Hazards 1g. Rotating parts/pinch points	1a. Use proper lifting techniques 1b. Watch footing and hand placement 1c. Note overhead utilities and proximity to rig and/or tooling 1d. Avoid hazardous plants and animals 1e. Use cut-proof gloves under nitriles 1f. Take breaks and hydrate as needed 1g. Monitor work space using 4-gas and PID meters 1h. Adhere to RSP 1i. Wear hearing protection and safety glasses.	S	Cr	M

Drilling, Casing Installation, and Borehole Abandonment Activities

Job Steps	Hazards	Controls	P	S	RAC
	1h. Radiological/Chemical Exposure 1i. Noise 1j. Heat/cold stress 1k. Overhead hazards				M
2. Staging and installation of temporary casing to facilitate downhole gamma surveys	2a. Overhead hazards 2b. Muscle strain 2c. Pinch points 2d. Slips, trips, falls 2e. Radiological/chemical exposure	2a. Wear hardhat and be aware of overhead tooling 2b. Use proper lifting techniques 2c. Avoid placing hands within 3ft of pinch points 2d. Watch footing 2e. Use cut-proof gloves 2f. Monitor breathing zones 2g. Adhere to RSP.	S	Cr	M
3. Well/piezometer construction activities, including casing installation, emplacement of annular materials, and moving rig.	3a. Overhead hazards 3b. Muscle strain 3c. Pinch points 3d. Slips, trips, falls 3e. Inhalation (silica, bentonite, cement) 3f. Radiological/chemical exposure 3g. Corrosive materials	3a. Wear hardhat and be aware of overhead tooling 3b. Use proper lifting techniques 3c. Avoid placing hands within 3ft of pinch points 3d. Watch footing 3e. Use cut-proof gloves 3f. Monitor breathing zones 3g. Adhere to RSP. 3h. Wear dust mask, gloves, goggles 3i. Avoid contact with leachate.	S	Cr	M
4. Borehole abandonment activities including casing removal and grout emplacement	4a. Overhead hazards 4b. Muscle strain 4c. Pinch points 4d. Slips, trips, falls 4e. Inhalation (silica, bentonite, cement) 4f. Radiological/chemical exposure 4g. Corrosive materials 4h. Pressurized lines	4a. Wear hardhat and be aware of overhead tooling 4b. Use proper lifting techniques 4c. Avoid placing hands within 3ft of pinch points 4d. Watch footing 4e. Use cut-proof gloves 4f. Monitor breathing zones 4g. Adhere to RSP. 4h. Wear dust mask, gloves, goggles 4i. Avoid contact with borehole liquids.	S	M	L
5. Equipment decontamination	5a. Contact with rinsate 5b. High pressure spray 5c. Noise 5d. Muscle strain 5e. Slips, trips, falls 5f. Radiological exposure	5a. Use proper lifting techniques 5b. Don splash guards, goggles, and waterproof clothing 5c. Watch footing 5d. Wear hearing protection 5e. Stay clear of high pressure spray 5f. Adhere to RSP.	S	M	L

Drilling, Casing Installation, and Borehole Abandonment Activities

Job Steps	Hazards	Controls	P	S	RAC
Equipment to be Used	Safety Items Required	Inspection Requirements			
<ul style="list-style-type: none"> • Drill Rig • Support Vehicle • Grout pump • Hand tools 	<ul style="list-style-type: none"> • 4-gas meter • TLD (1 per individual) • Stationary air sampler • Fire Extinguisher • 1st Aid Kit/Eyewash • Extra gloves, booties, and duct tape • Drinking water (stored outside controlled area) or in designated area(s) (i.e., tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> • Cell phone use for emergencies only. Evacuation route and directions to hospital are posted in each job trailer and common area, with copies available to be kept in project vehicles. • For heat/cold stress procedures see heat/cold stress AHA. • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Downhole Gamma Logging

Activity Hazard Analysis (AHA)

Activity/Work Task: Downhole Gamma Logging	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix					
Job Number: 451662	Severity	Probability				
Date Prepared: 3/26/2020 Date Revised:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Frequent</td> <td style="text-align: center;">Likely</td> <td style="text-align: center;">Occasional</td> <td style="text-align: center;">Seldom</td> <td style="text-align: center;">Unlikely</td> </tr> </table>	Frequent	Likely	Occasional	Seldom
Frequent	Likely	Occasional	Seldom	Unlikely		
Prepared by (Name/Title): P. Scharfschwerdt	Catastrophic	E E H H M				
Reviewed by (Name/Title):	Critical	E H H M L				
	Marginal	H M M L L				
Employer/GBU: INF	Negligible	M L L L L				
	<p>Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.</p> <p>P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</p> <p>S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.</p>					
<p>Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including:</p> <ul style="list-style-type: none"> Tyvek coverings for all body parts, excluding head and hands. Steel toed boots Safety glasses High Visibility Safety Vest Leather work gloves while auger and tools Nitrile gloves when handling site soil or sediment Hard hat Hearing protection as needed Personal radiation dosimeter 		<p>RAC Chart</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: red; color: white;"> <td style="text-align: center;">E = Extremely High Risk</td> </tr> <tr style="background-color: orange;"> <td style="text-align: center;">H = High Risk</td> </tr> <tr style="background-color: yellow;"> <td style="text-align: center;">M = Moderate Risk</td> </tr> <tr style="background-color: green;"> <td style="text-align: center;">L = Low Risk</td> </tr> </table>	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
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L = Low Risk						

Job Steps	Hazards	Controls	P	S	RAC
1. Lifting/setting up equipment	Back Injury, muscle strain/stress	<ol style="list-style-type: none"> 1. Personnel will utilize proper lifting technique and ask for help when needed. 2. Reduce bending, twisting, kneeling through use of alternating work and periodic stretching breaks to reduce static or awkward postures. 3. Keep hands free of pinch points on spool, and away from pinch points between equipment and well casing. 	O	M	M

Downhole Gamma Logging

Job Steps	Hazards	Controls	P	S	RAC
2. Perform Survey with assistance of hand winch/crank	Pinch points/rotating pieces	<ol style="list-style-type: none"> Cut resistant gloves Be aware of moving pieces 	L	M	M
3. Instrument decontamination	Chemical exposure during logging equipment decontamination	<ol style="list-style-type: none"> If decontamination of the logging equipment uses chemicals containing physical or health hazards are required, ensure the SDS is reviewed and ensure adequate PPE is used and 1st Aid measures are in place. Use nitrile or the proper chemical resistant gloves for decontamination activity. Ensure an eye wash station is located close by or have a portable eye wash bottle with sampling equipment. 	S	M	L
Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements			
<ul style="list-style-type: none"> Level D PPE Minimum. Task Dependent Safety eyewear Proper Gloves (Insulated, leather palm, cut resistant, chemical resistant) Hearing protection as needed Personal dosimeter as required 4-gas meter Repellent, Sunscreen, Potable Water Fire Extinguishers Communication Devices 40-Hour HAZWOPER/8-hour refresher 	<ul style="list-style-type: none"> Ensure personnel are trained on proper operation of monitoring equipment and understand action levels specified in the PSHEP Drinking water (stored outside controlled area) or in designated area(s) (i.e., tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> Ensure monitoring equipment is in proper working order and properly calibrated. If conditions encountered in the field are not what is expected, every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment. <li style="color: red;">For heat/cold stress procedures see heat/cold stress AHA. 			

Core Examination, Logging and Sample Collection

Activity Hazard Analysis (AHA)

Activity/Work Task: Core examination/logging, collection of samples, core archiving, and accessing stored cores.	Overall Risk Assessment Code (RAC) (Use highest code)	Moderate
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix	
Job Number: 451662	Severity	Probability
Date Prepared: 7/9/2020 Date Revised:		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): P. Scharfschwerdt; Sr. Geologist	Catastrophic	E E H H M
Reviewed by (Name/Title): Darrell Pruitt	Critical	E H H M L
	Marginal	H M M L L
Employer/GBU: INF	Negligible	M L L L L
	<p>Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.</p> <p>P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</p> <p>S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.</p>	
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> • Steel toed boots • Hearing protection • Safety glasses • Reflective outerwear • Protective clothing • Disposable boot covers or rubber boots • Nitrile gloves when handling site soil or sediment • Hard hat • Personal radiation dosimeter 		RAC Chart <div style="background-color: red; color: white; padding: 2px; text-align: center;">E = Extremely High Risk</div> <div style="background-color: orange; color: white; padding: 2px; text-align: center;">H = High Risk</div> <div style="background-color: yellow; color: black; padding: 2px; text-align: center;">M = Moderate Risk</div> <div style="background-color: green; color: black; padding: 2px; text-align: center;">L = Low Risk</div>

Job Steps	Hazards	Controls	P	S	RAC
1. Open plastic sleeve containing core and scan core for alpha and gamma activity per approved procedure	1a. Cuts/abrasions from sharp objects in waste or from improper use of tools 1b. Radiological exposure	1a. Wear cut resistant gloves 1b. Utilize time/distance/shielding protocols as directed by HPT 1c. Adhere to RSP requirements	U	Cr	L

Core Examination, Logging and Sample Collection

Job Steps	Hazards	Controls	P	S	RAC
2. Log core for descriptions of waste and soil types/characteristics, as per FSP, and photolog core	2a. Cuts/abrasions from sharp objects in waste or from improper use of tools 2b. Radiological exposure	2a. Wear cut resistant gloves 2b. Utilize time/distance/shielding protocols as directed by HPT 2c. Adhere to RSP requirements 2d. Employ asbestos inspection & implement actions as directed by licensed inspector.	U	Cr	L
3. Collect core sample(s) of soil/soil-like materials into appropriate containers in accordance with FSP.	3a. Radiological exposure 3b. Airborne asbestos exposure if hazard(s) indicated in previous steps.	3a. Wear cut resistant gloves 3b. Utilize time/distance/shielding protocols as directed by HPT and/or asbestos controls if hazard(s) present 3c. Adhere to RSP requirements	U	Cr	L
4. Decontaminate sampling/logging tools in accordance with QAPP/FSP	4a. Radiological Exposure	4a. Wear cut resistant gloves 4b. Utilize time/distance/shielding protocols as directed by HPT and/or asbestos controls if hazard(s) present 4c. Adhere to RSP requirements	O	L	L
5. Reseal plastic sleeve around core and insert into PVC tube labeled with borehole ID and drilled interval; store tube in designated locations	5a. Radiological exposure 5b. Muscle strain 5c. Airborne asbestos exposure when accessing stored cores	5a. Wear cut resistant gloves 5b. Utilize time/distance/shielding protocols as directed by HPT and/or asbestos controls if hazard(s) present. 5c. Adhere to RSP during activity and when accessing stored cores. 5d. When possible, utilize mechanical means to lift or utilize two people to lift if no radiological or asbestos hazards.	O	M	M
Equipment to be Used	Safety Items Required	Inspection Requirements			
<ul style="list-style-type: none"> • Hand tools • Sample ware • Tape measure • Camera • Decon supplies 	<ul style="list-style-type: none"> • 4-gas meter • TLD (1 per individual) • Stationary air sampler • Fire Extinguisher • 1st Aid Kit/Eyewash • Extra gloves, booties, and duct tape • Drinking water (stored outside controlled area) or in designated area(s) (i.e. tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> • Cell phone use for emergencies only. Evacuation route and directions to hospital are posted in each job trailer and common area, with copies available to be kept in project vehicles. • For heat/cold stress procedures see heat/cold stress AHA. • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Oversight/Support of Brush Clearing and NCC Repair Operations

Activity Hazard Analysis (AHA)

Activity/Work Task: Oversight/support of equipment to clear brush, suppress dust, mow weeds, spray vegetation with retardant/herbicide, and repair NCC.	Overall Risk Assessment Code (RAC) (Use highest code)	Moderate					
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix						
Job Number: 451662	Severity	Probability					
Date Prepared: 7/9/2020 Date Revised:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%;">Frequent</td> <td style="width: 16.6%;">Likely</td> <td style="width: 16.6%;">Occasional</td> <td style="width: 16.6%;">Seldom</td> <td style="width: 16.6%;">Unlikely</td> </tr> </table>	Frequent	Likely	Occasional	Seldom	Unlikely
Frequent	Likely	Occasional	Seldom	Unlikely			
Prepared by (Name/Title): P. Scharfschwerdt; Sr. Geologist	Catastrophic	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: red;">E</td> <td style="width: 16.6%; background-color: red;">E</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: yellow;">M</td> </tr> </table>	E	E	H	H	M
E	E	H	H	M			
Reviewed by (Name/Title): Darrell Pruitt	Critical	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: red;">E</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: green;">L</td> </tr> </table>	E	H	H	M	L
	E	H	H	M	L		
	Marginal	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: orange;">H</td> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: green;">L</td> <td style="width: 16.6%; background-color: green;">L</td> </tr> </table>	H	M	M	L	L
H	M	M	L	L			
Negligible	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%; background-color: yellow;">M</td> <td style="width: 16.6%; background-color: green;">L</td> </tr> </table>	M	L	L	L	L	
M	L	L	L	L			
Employer/GBU: INF	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.						
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Steel toed boots Hearing protection Safety glasses Reflective outerwear Protective clothing Disposable boot covers or rubber boots Nitrile gloves when handling site soil or sediment Hard hat Personal radiation dosimeter 	P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">RAC Chart</td> </tr> <tr> <td style="background-color: red; color: white; text-align: center;">E = Extremely High Risk</td> </tr> <tr> <td style="background-color: orange; text-align: center;">H = High Risk</td> </tr> <tr> <td style="background-color: yellow; text-align: center;">M = Moderate Risk</td> </tr> <tr> <td style="background-color: green; text-align: center;">L = Low Risk</td> </tr> </table>	RAC Chart	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
RAC Chart							
E = Extremely High Risk							
H = High Risk							
M = Moderate Risk							
L = Low Risk							
	S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible						
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.						

Job Steps	Hazards	Controls	P	S	RAC
1. Clear vegetation from NCC.	1a. Noise 1b. Slips, Trips, Falls 1c. Uneven terrain 1d. Thrown rocks 1e. Heat Stress 1f. Insects/snakes 1g. Poisonous plants 1h. Radiological Exposure	1a. Use hearing protection & safety glasses 1b. Maintain dust suppression. 1c. Monitor for indications of heat stress & act on them 1d. Adhere to RSP requirements.	U	M	L

Oversight/Support of Brush Clearing and NCC Repair Operations

Job Steps	Hazards	Controls	P	S	RAC
2. Repair ruts and washouts of NCC on slopes/access roads	2a. Noise 2b. Moving equipment 2c. Radiological exposure 2d. Steep slopes	2a. Use hearing protection & safety glasses 2b. Stay >15 ft from equipment 2c. Maintain dust suppression measures 2d. Adhere to requirements of the RSP 2e. Monitor for heat/cold stress indicators and act upon them.	O	M	M
3. Decontaminate personnel/equipment in designated locations (if necessitated by frisking/wipe sample results)	3a. Slips, trips, and falls 3b. Muscle strain	3a. Watch footing 3b. Use safety glasses 3c. Avoid spray 3d. Use proper lifting techniques/ergonomics 3e. Contain rinsate	U	M	L
4. Spray weed/vegetation control chemical on emerging plants	4a. Uneven surfaces 4b. Moving equipment 4c. Chemical exposure	4a. Review Safety Data Sheet(s) from manufacturer and follow recommended engineering controls, PPE, etc. 4b. Traverse spray areas slowly, avoid steep slopes 4c. Report spills 4d. Be aware of overspray/wind direction 4e. Adhere to RSP requirements	U	M	L
Equipment to be Used	Safety Items Required	Inspection Requirements			
<ul style="list-style-type: none"> • Skid Steer w/ attachments • Water truck • Trimmers • Clippers • Sprayer 	<ul style="list-style-type: none"> • 4-gas meter • TLD (1 per individual) • Stationary air sampler • Fire Extinguisher • 1st Aid Kit/Eyewash • Extra gloves, booties, and duct tape • Drinking water (stored outside controlled area) or in designated area(s) (i.e., tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> • Cell phone use for emergencies only. Evacuation route and directions to hospital are posted in each job trailer and common area, with copies available to be kept in project vehicles. • For heat/cold stress procedures see heat/cold stress AHA. • If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Oversight/Support of Brush Clearing Operations

Activity Hazard Analysis (AHA)

Activity/Work Task: Oversight/support of heavy equipment operations to clear brush, suppress dust, perform minor grading, and fabric/aggregate placement during access path/drilling pad construction.	Overall Risk Assessment Code (RAC) (Use highest code)	Moderate									
Project Location: West Lake Landfill	Risk Assessment Code (RAC) Matrix										
Job Number: 451662	Severity	Probability									
Date Prepared: 7/9/2020 Date Revised:		Frequent	Likely	Occasional	Seldom	Unlikely					
Prepared by (Name/Title): P. Scharfschwerdt; Sr. Geologist	Catastrophic	E	E	H	H	M					
Reviewed by (Name/Title): Darrell Pruitt	Critical	E	H	H	M	L					
Employer/GBU: INF	Marginal	H	M	M	L	L					
Notes: (Field Notes, Review Comments, etc.) Modified Level D PPE Required including: <ul style="list-style-type: none"> Steel toed boots Safety glasses High Visibility Safety Vest Nitrile gloves when handling site soil or sediment Hard hat Personal radiation dosimeter 	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: center; padding: 5px;">RAC Chart</td> </tr> <tr> <td style="text-align: center; background-color: red; color: white; padding: 5px;">E = Extremely High Risk</td> </tr> <tr> <td style="text-align: center; background-color: orange; padding: 5px;">H = High Risk</td> </tr> <tr> <td style="text-align: center; background-color: yellow; padding: 5px;">M = Moderate Risk</td> </tr> <tr> <td style="text-align: center; background-color: green; padding: 5px;">L = Low Risk</td> </tr> </table>					RAC Chart	E = Extremely High Risk	H = High Risk	M = Moderate Risk	L = Low Risk
RAC Chart											
E = Extremely High Risk											
H = High Risk											
M = Moderate Risk											
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P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible										
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.											

Job Steps	Hazards	Controls	P	S	RAC
1. Clear brush, fell trees, perform dust suppression as needed.	1a. Noise 1b. Falls 1c. High-speed projectiles 1d. Limited visibility 1e. Steep slopes 1f. Moving equipment 1g. Radiological exposure.	1a. Use hearing protection & safety glasses 1b. Stay >15 ft from equipment 1c. Maintain dust suppression measures 1d. Adhere to requirements of the RSP	O	M	M

Oversight/Support of Brush Clearing Operations

Job Steps	Hazards	Controls	P	S	RAC
2. Grading support in preparation of fill/fabric placement	2a. Noise 2b. Moving equipment 2c. Radiological exposure	2a. Use hearing protection & safety glasses 2b. Stay >15 ft from equipment 2c. Maintain dust suppression measures 2d. Adhere to requirements of the RSP	U	Cr	L
3. Fabric application and aggregate grading and compacting	3a. Noise 3b. Moving equipment 3c. Radiological exposure	3a. Use hearing protection & safety glasses 3b. Stay >15 ft from equipment 3c. Maintain dust suppression measures 3d. Adhere to requirements of the RSP	U	Cr	L
4. Decontaminate equipment at designated locations.	4a. Slips, trips, and falls 4b. Muscle strain	4a. Watch footing, use safety glasses, avoid spray 4b. Use proper lifting techniques/ergonomics	U	M	L
Equipment to be Used	Safety Items Required	Inspection Requirements			
<ul style="list-style-type: none"> Forestry mower Skid steer Water truck Hand tools Chain saws 	<ul style="list-style-type: none"> 4-gas meter TLD (1 per individual) Stationary air sampler Fire Extinguisher 1st Aid Kit/Eyewash Extra gloves, booties, and duct tape Drinking water (stored outside controlled area) or in designated area(s) (i.e., tented area within work zone if hot/humid conditions). 	<ul style="list-style-type: none"> Cell phone use for emergencies only. Evacuation route and directions to hospital are posted in each job trailer and common area, with copies available to be kept in project vehicles. <li style="color: red;">For heat/cold stress procedures see heat/cold stress AHA. If conditions encountered in the field are not what is expected <u>ANY TEAM MEMBER MAY STOP WORK</u> to ensure the team and the sites safety. 			

Appendix D – Training Matrix

Appendix D
West Lake Landfill Project
Training Matrix
Revision Date: 2/5/2020

Employee Name / Employee Title / Employee Function	Required Compliance / Risk Control / Risk Management Training	Required Licenses / Designations of Authority / Competencies / Qualifications / Certifications	Frequency of Required Refresher Training / Assessment of Continuing Competency
Parsons and subcontractor field staff performing field work.	Site orientation / PSHEP review and sign-off (Parsons field staff) / SSHEP review and sign-off (Subcontractor field staff)	Sign PSHEP / SSHEP	Prior to working on site (or property (typical))
Parsons and subcontractor personnel performing field work	24 or 40-Hr Hazwoper Training	Obtain 24 or 40-hr Hazwoper training certificate	Minimum training for working on site
Parsons and subcontractor personnel performing field work	8-Hr Hazwoper Refresher Training	Obtain 8-hr Hazwoper refresher training certificate	Minimum training for working on site
One field staff per team	First Aid / CPR / AED	Designated provider of first aid / CPR	Every 2 years (with bloodborne pathogens training)
Parsons and subcontractor field staff performing field work	Emergency Action Plan	Can be included in PSHEP review or provided verbally during tailgate safety meeting.	On initial assignment; upon material changes to emergency action plan changes
Parsons field staff including project manager, construction manager, site construction representatives, samplers, property representative, and subcontractor field staff	Hazard Communication	PSHEP review and location of SDS	On initial assignment; when new chemicals are added to the work environment
Project field personnel including visitors	Minimum PPE: Hardhats, gloves, eye protection, safety boots, safety vests and hearing protection (where required) Additional PPE as required by task specific AHAs	PSHEP review	On initial assignment; upon changes to PPE use
Project field personnel who in one year may receive at least 100 mrem of radiation from West Lake Landfill.	Radiation Safety Training Module 2 – administered by Ameriphysics	Completion and passing a written examination	On initial assignment and annual refresher.
Radiation Safety Officer	RSO 40-hr certification	Obtain 40-hr RSO certificate	Annual

Note: Training referenced above is limited to worker health and safety. It does not cover other subcontractor non-health and safety-related training requirements.

Appendix E - Forms

PARSONS		
Daily SH&E Planner (Sheet 1 of 3)		
Personal Safety & Health Planner for Your Daily SH&E Huddle		
Employee Name:	Date:	
Employee Number:	Craft:	
Supervisor:	Location of Work:	
Work Description:		
Employee Planning Checklist		
Complete the checklist for each new work operation. Check the "YES" box for those items needed to safely perform your work. All boxes marked "YES" should be properly addressed before the work operation begins.		
Employee Daily Work Area Assessment		
All conditions must be satisfied in order to start or continue working. Formally check your work area at least four times a day and at the start of teach new work operation. Report all problems to your supervisor.		
Employee Planning Checklist		
Personal Protective Equipment	Yes	N/A
Hard Hat/Safety Glasses	<input type="checkbox"/>	<input type="checkbox"/>
Face Shield	<input type="checkbox"/>	<input type="checkbox"/>
Goggles – Cutting, Chemical, Dust	<input type="checkbox"/>	<input type="checkbox"/>
Hearing Protection	<input type="checkbox"/>	<input type="checkbox"/>
Respirator	<input type="checkbox"/>	<input type="checkbox"/>
Gloves – Type	<input type="checkbox"/>	<input type="checkbox"/>
Clothing – Type	<input type="checkbox"/>	<input type="checkbox"/>
Foot Protection	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>
Special Equipment	Yes	N/A
Harness/Double Lanyards/Decelerator Device	<input type="checkbox"/>	<input type="checkbox"/>
Life Line – Horizontal, Vertical, Retractable	<input type="checkbox"/>	<input type="checkbox"/>
Air Monitor	<input type="checkbox"/>	<input type="checkbox"/>
Tripod/Rescue Devices	<input type="checkbox"/>	<input type="checkbox"/>
Barricades/Flagging	<input type="checkbox"/>	<input type="checkbox"/>
Fire Extinguishers	<input type="checkbox"/>	<input type="checkbox"/>
Signs	<input type="checkbox"/>	<input type="checkbox"/>
Electrical Insulating Materials, Blankets, Tools, Gloves	<input type="checkbox"/>	<input type="checkbox"/>
Chemical/Oil Spill Kits	<input type="checkbox"/>	<input type="checkbox"/>
Communication Devices – Radios, Horns	<input type="checkbox"/>	<input type="checkbox"/>

PARSONS		
Daily SH&E Planner (Sheet 2 of 3)		
Employee Planning Checklist (Contd)		
Environmental Issues	Yes	N/A
Resource Conservation/Sustainability	<input type="checkbox"/>	<input type="checkbox"/>
Air Pollution/Emissions	<input type="checkbox"/>	<input type="checkbox"/>
Wastewater Discharges	<input type="checkbox"/>	<input type="checkbox"/>
Drinking Water	<input type="checkbox"/>	<input type="checkbox"/>
Management of Hazardous Materials and Hazardous and Solid Wastes	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Response to Spills and Releases	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Assessments	<input type="checkbox"/>	<input type="checkbox"/>
Buried Items	<input type="checkbox"/>	<input type="checkbox"/>
Protected Ecological and Cultural Resources	<input type="checkbox"/>	<input type="checkbox"/>
Specific Reports (Required by Environmental Regulation) on Toxic or Hazardous Chemicals Usage and Storage	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
Work Permits	Yes	N/A
Activity Hazards Analysis	<input type="checkbox"/>	<input type="checkbox"/>
Trench and Excavation Notice	<input type="checkbox"/>	<input type="checkbox"/>
Confined Space Permit	<input type="checkbox"/>	<input type="checkbox"/>
Welding and Cutting Permit	<input type="checkbox"/>	<input type="checkbox"/>
Crane and Hoist Lift Plan	<input type="checkbox"/>	<input type="checkbox"/>
Crane Suspended Work Platform	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>
Tagging Procedure	Yes	N/A
Scaffolding	<input type="checkbox"/>	<input type="checkbox"/>
Lockout and/or Tagout	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

PARSONS										
Daily SH&E Planner (Sheet 3 of 3)										
Employee Daily Work Area Assessment										
Times										
Initials										
							Yes	N/A		
A means of safe access and egress is provided to my work area.							<input type="checkbox"/>	<input type="checkbox"/>		
My work area is clean and organized.							<input type="checkbox"/>	<input type="checkbox"/>		
I have the tools and equipment necessary to perform my work.							<input type="checkbox"/>	<input type="checkbox"/>		
My work area has adequate lighting.							<input type="checkbox"/>	<input type="checkbox"/>		
I know how to, and have the means available, to summon emergency assistance.							<input type="checkbox"/>	<input type="checkbox"/>		
I have a copy of, or have been trained on, the MSDS for the hazardous material I am working with.							<input type="checkbox"/>	<input type="checkbox"/>		
The equipment I am working on, or working in, has been properly tagged out/ locked out, cleaned, vented, and drained, as well as stored energy released as required.							<input type="checkbox"/>	<input type="checkbox"/>		
My work operation is properly controlled so that other workers will not be adversely affected by dust, fumes, sparks, slag, welding flash, floor holes, fall hazards, falling objects, overhead loads, slippery surfaces, etc.							<input type="checkbox"/>	<input type="checkbox"/>		
I have performed an act of safety.							<input type="checkbox"/>	<input type="checkbox"/>		
I have the necessary training to safely perform my work.							<input type="checkbox"/>	<input type="checkbox"/>		
I will not be handling liquid chemicals, fuels, etc. and do not need spill response equipment and supplies; or I have the materials and know how to get assistance if needed.							<input type="checkbox"/>	<input type="checkbox"/>		
I will not be discharging any wastewater or storm water from my work area.							<input type="checkbox"/>	<input type="checkbox"/>		
The work I am doing is not covered by an environmental permit.							<input type="checkbox"/>	<input type="checkbox"/>		
I do not generate any chemical wastes as part of work.							<input type="checkbox"/>	<input type="checkbox"/>		
I have the authority to stop unsafe operations!							<input type="checkbox"/>	<input type="checkbox"/>		
Supervisor's Safety & Health Audit										
Times:										
Initials:										
Safety, Health, and Environmental Suggestions:										

ESHARP 2-WEEK LOOK AHEAD MEETING

SH&E Plan for Week Ending:		Contractor:	
Project/ Location:		Meeting Date:	
Plan Prepared by:		Date Prepared:	

Next Two Weeks' Scope of Work:

Identified SH&E Risks / Exposures / Hazards / Issues:

Identify Tasks requiring environmental construction permitting (e.g., storm water permit) or involving other environmental regulatory issues (e.g., generation of new, uncharacterized waste):

Tasks with environmental risk of significant spills or releases:

Control Measures:

Additional Activity Hazards Analysis Required:

Contractors and Subcontractors Mobilizing / Demobilizing:

Audits/Inspections Scheduled:

Competent Person Changes:

Planned Orientation / Training:

Recommendations / Comments / Concerns:

Note: This information shall be incorporated into the meeting minutes.



Initial Contractor Employee Training Acknowledgment

Name, title, and employer of trainer: _____

Training subject: _____

Training materials used: _____

Name of contractor employee trained: _____

Date of hire/assignment: _____

I, certify that I have received training as described above in the following areas.

Name of Contractor Employee (Printed)

- The potential occupational hazards in general in the work area and associated with my job assignment.
- General SH&E requirements indicate the safe work conditions, safe work practices, personal protective equipment, and environmental requirements required for my work.
- The hazards of any chemicals to which I may be exposed and my right to information contained on material safety data sheets for those chemicals, and how to understand this information.
- My right to ask questions, or provide any information to the employer on safety, health, or environment either directly or anonymously without any fear of reprisal.
- Disciplinary procedures the employer will use to enforce compliance with general safety requirements.

I understand this training and agree to comply with general safety requirements for my work area.

Contractor Employee Signature

Date

SAFETY, SECURITY, HEALTH, AND ENVIRONMENTAL ORIENTATION ACKNOWLEDGMENT

I, **(printed name of new project employee)**, acknowledge receiving, reviewing, and understanding the safety, security, health, and environmental orientation information for working on this project. I understand that I shall not perform work on this project unless I am knowledgeable and have received the necessary training to safely and effectively carry out the work I am assigned. I understand that I have the authority and responsibility to stop work and ask my supervisor about any safety, security, health, and environmental matters for which I am unsure or for which I am untrained.

Subject matter covered in my orientation included the following.

<Insert the new project employee's custom orientation plan subject matter here. Use two columns, if necessary.

Refer to the Sample Custom Orientation Plan in Appendix 14.4-1.>

Signature of New Project Employee

Signature of New Project Employee's Supervisor

Date Signed by New Project Employee

Signature of New Project Employee's Mentor

Signed acknowledgments shall be maintained in the new project employee's training file.

CONTRACTOR KICKOFF / PREMOBILIZATION SH&E MEETING CHECKLIST

Date:		Project/Location:			
Parsons Representative:		Contractor Representative:			
The following project site safety, health, security, and environmental requirements, procedures, and hazards have been identified and reviewed with the contractor:					
Mark with "X"	Item	Mark with "X"	Item	Mark with "X"	Item
<input type="checkbox"/>	Air Pollution and Emissions	<input type="checkbox"/>	Fall Protection, Guardrails, and/or Scaffolding	<input type="checkbox"/>	Personal Protective Equipment
<input type="checkbox"/>	Asbestos	<input type="checkbox"/>		<input type="checkbox"/>	Process Safety Management (PSM)
<input type="checkbox"/>	Buried Items	<input type="checkbox"/>	Fire Protection	<input type="checkbox"/>	Protected Ecological and Cultural Resources
<input type="checkbox"/>	Competent / Qualified Person	<input type="checkbox"/>	Hazardous Materials and Wastes	<input type="checkbox"/>	Resource Conservation and Sustainability
<input type="checkbox"/>	Confined Spaces (Permit / Non-Permit)	<input type="checkbox"/>	Hot Work, Welding, and/or Cutting	<input type="checkbox"/>	Site Security, Visitor Control, and Public Exposure
<input type="checkbox"/>	Cranes / Hoists / Annual Inspection Certificate(s)	<input type="checkbox"/>	Ladders	<input type="checkbox"/>	Specific Reports (Required by Environmental Regulation) on Toxic or Hazardous Chemicals Usage and Storage
<input type="checkbox"/>	Demolition	<input type="checkbox"/>	Lead Paint	<input type="checkbox"/>	
<input type="checkbox"/>	Drinking Water	<input type="checkbox"/>	Lockout / Tagout	<input type="checkbox"/>	
<input type="checkbox"/>	Electrical	<input type="checkbox"/>	Management of Hazardous Materials and Hazardous Solid Wastes	<input type="checkbox"/>	SSHEP, Emergency Mgmt. and Response Plan
<input type="checkbox"/>	Emergency Response to Spills and Releases	<input type="checkbox"/>		<input type="checkbox"/>	Wastewater Discharges
<input type="checkbox"/>	Environmental Assessments	<input type="checkbox"/>	Overhead Power Lines	<input type="checkbox"/>	Vehicle and Heavy Equipment
<input type="checkbox"/>	Excavations and Trenches	<input type="checkbox"/>	Permits (Excavations, Scaffolding, Demolition, Traffic, Confined Spaces, etc.)	<input type="checkbox"/>	Other:
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Protection of the Public:					
Additional Project Concerns:					
Attendees:					
	Name	Title	Company		

SAFETY – MAKE IT PERSONAL! – TAKE 5 FOR SAFETY

Date: _____

Project/Task: _____

Your Name: _____

Before you begin any new task, pause for 5 minutes and ask yourself the following questions. Take corrective actions as necessary prior to beginning work.

- Do I know exactly what I am doing?
- Have I reviewed the AHA for this task?
- Do I have all the right people involved?
- Is there any potential that I or my coworkers could get hurt?
- Are there any questions I should be asking fellow employees?
- Should I talk to my supervisor?
- Have I read the work plan and fully understand the procedures relating to this job?
- Am I using the proper tools?
- Do I have the proper PPE?
- Will I be working as safely as I know how?
- Do I see anything that just doesn't look quite right?
- Am I in a hurry? Would I be safer if I slowed down?

You must honestly and completely answer “YES” to each of these questions before you begin your work. No task in Parsons is so important that you must jeopardize your safety. You can stop or pause any work activity if you need to.

Job Hazards? (List the hazards of the task and how you will be protected from them.)

1. Hazards: _____

Protection: _____

2. Hazards: _____

Protection: _____

3. Hazards: _____

Protection: _____

Work Area	Yes	No
Work area clean?	<input type="checkbox"/>	<input type="checkbox"/>
Permits obtained?	<input type="checkbox"/>	<input type="checkbox"/>
Standard PPE being used (<i>hard hat, vest, eye protection, gloves, safety boots</i>)?	<input type="checkbox"/>	<input type="checkbox"/>
Any additional PPE needed? List it here and then go get it if you don't have it with you.		

Briefly review the hazards and protection again after taking a break.

Appendix F – SSHEP Freezor

Information Required in an SSHEP

Section	Title	Section	Title
1	Project Owner, Project Name, and Contractor’s Safety, Health, and Environmental Policy Statement	11	Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions
2	Scope of Work Evaluation	12	Employee Participation and Consultation
3	Responsibility and Identification of Key Personnel	13	Emergency Action Plan
4	Overall Assessment of SH&E Hazards, Exposures, and Risks	14	Site-specific Medical Emergency Plan
5	Relevant SH&E Compliance Programs, Associated Compliance Information, and Personnel Responsibility Assignments	15	Incident Reporting, Investigation, and Corrective Action Processes
6	SH&E Compliance Training Matrix and Training / Education Processes	16	Work Site Inspection and Program Audit Processes
7	Site-specific Worker Orientation Program	17	Progressive Disciplinary Program
8	Identification of Competent / Qualified Personnel	18	Recordkeeping / Document Retention Processes
9	Hazard Identification, Notification, and Correction Process	19	Other (as defined by Contractor or Parsons)
10	Specific Hazard and Risk Control Measures (e.g., Activity Hazard Analyses, Operational Risk Management Processes)	20	Other (as defined by Contractor or Parsons)

Date: 2/5/2020

Project/Location: _____

Contractor Name: Feezor Engineering, Inc.

Parsons SH&E Representative: _____

The information provided here is based on a review of the contractor site-specific safety, health, and environmental plan (SSHEP). Areas identified as incomplete shall be revised based on the standards in the contract specifications and the project safety, health, and environmental plan (PSHEP). Contractors shall resubmit revised sections of the SSHEP to the project manager within 1 week of receiving this review documentation.

Section	Complete	Incomplete	Section	Complete	Incomplete
Statement of SH&E Policy	<input type="checkbox"/>	<input type="checkbox"/>	Specific Activity Hazard Analyses (AHAs) and Operational Risk Assessments	<input type="checkbox"/>	<input type="checkbox"/>
Scope of Work Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	Adequate Hazard / Risk Controls	<input type="checkbox"/>	<input type="checkbox"/>
Key Line Personnel Identified	<input type="checkbox"/>	<input type="checkbox"/>	2-Week Look-ahead Planning	<input type="checkbox"/>	<input type="checkbox"/>
Overall Assessment of Hazards and Risks	<input type="checkbox"/>	<input type="checkbox"/>	Employee Participation and Consultation	<input type="checkbox"/>	<input type="checkbox"/>
Relevant SH&E Compliance Programs (Hazard Communication, PPE, HAZWOPER, Hazardous Energy Control, Fall Protection, Confined Space Entry, RCRA, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Action Plan	<input type="checkbox"/>	<input type="checkbox"/>
SH&E Compliance Program Responsibilities Assigned	<input type="checkbox"/>	<input type="checkbox"/>	Site-specific Medical Emergency Plan	<input type="checkbox"/>	<input type="checkbox"/>
Compliance Training and Education Programs	<input type="checkbox"/>	<input type="checkbox"/>	Incident Reporting, Investigation, and Corrective Action Processes	<input type="checkbox"/>	<input type="checkbox"/>
Site-specific Worker Orientation Program	<input type="checkbox"/>	<input type="checkbox"/>	Work Site Inspection and Program Audit Processes	<input type="checkbox"/>	<input type="checkbox"/>
Competent and Qualified Personnel Identified	<input type="checkbox"/>	<input type="checkbox"/>	Progressive Disciplinary Program	<input type="checkbox"/>	<input type="checkbox"/>
Hazard Identification, Notification, and Correction Process	<input type="checkbox"/>	<input type="checkbox"/>	Recordkeeping / Document Retention Processes	<input type="checkbox"/>	<input type="checkbox"/>

Additional Comments / Other SSHEP Sections or Information Required

Reviewed by:

Name

Title

Feezor Engineering, Inc.

West Lake Landfill OU-1 Design Investigation

Contractor Site-specific Safety, Health, and
Environmental Plan (SSHEP)

October 26, 2020

Table of Contents

Contractor’s Safety, Health, and Environmental Policy Statement 5

Scope of Work Evaluation 6

Responsibilities and Identification of Key Personnel 7

Overall Assessment of SH&E Hazards, Exposures, and Risks 8

SH&E Compliance Programs 9

SH&E Compliance Training Matrix and Training / Education Processes..... 10

Site-specific Worker Orientation Program 11

Identification of Competent / Qualified Persons 12

Hazard Identification, Notification, and Correction Process 13

Specific Hazard and Risk Control Measures 14

Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions..... 15

Employee Participation and Consultation 16

Emergency Action Plan 17

Site-specific Medical Emergency Plan 18

Incident Reporting, Investigation, and Corrective Action Processes 19

Work Site Inspection and Program Audit Process..... 20

Progressive Disciplinary Program..... 21

Recordkeeping / Document Retention Processes 22

Appendices 23

Contractor's Safety, Health, and Environmental Policy Statement

This plan contains the minimum requirements for an effective contractor site-specific safety, health, and environmental Plan (SSHEP) by Feezor Engineering, Inc. for the West Lake Landfill OU-1 Design Investigation. This SSHEP shall be implemented and maintained by Feezor Engineering, Inc. This SSHEP applies to all persons of our company.

The leadership team is responsible for ensuring that all SH&E policies and procedures are clearly communicated and understood by all employees. Managers and supervisors are expected to enforce the rules fairly and uniformly.

All employees are responsible for using safe work practices, following all directives, policies and procedures, and assisting in maintaining a safe work environment.

Our system of ensuring that all workers comply with the rules and maintain a safe work environment includes the following.

- Informing workers of the provisions of this SSHEP
- Evaluating the SH&E performance of all workers
- Recognizing employees who consistently perform SH&E work practices very well
- Providing training to workers whose SH&E performance is deficient
- Disciplining workers for failure to comply with safe, healthful, and environmentally responsible work practices

Scope of Work Evaluation

Field tasks to be performed by Feezor Engineering, Inc. during the West Lake Landfill OU-1 Design Investigation will include the following:

Task 1 – Provide assistance and associated field support for the survey contractor during staking of the proposed borehole locations within OU-1 Areas 1 & 2

Task 2 – Provide assistance and associated field support for the construction services contractor during construction of borehole access routes and drilling pads at locations within OU-1 Areas 1 & 2, within Bridgeton Landfill's North Quarry, and at any other Design Investigation (DI) drilling locations, as warranted

Task 3 – Oversee drilling/sampling activities and provide associated field support for the drilling contractor as needed

Task 4 – Record pertinent information obtained during drilling/sampling activities in a log book, including blow counts, weather conditions, dates/times of notable events or developments, notes on any problems encountered, etc. as needed

Task 5 – Provide assistance and associated field support for the radiological services contractor during core sample collection/storage, preliminary core scanning activities, and downhole gamma logging activities

Task 6 – Provide assistance and associated field support for the drilling contractor during borehole abandonment activities

Task 7 – Provide assistance and associated field support for the radiological services contractor during decontamination activities as needed

Task 8 – Visually inspect and geologically log core samples, photo-document core samples, and collect laboratory samples from the cored material as needed

Task 9 – Provide assistance to the radiological services contractor during performance of detailed radiological core scanning activities

Task 10 – Coordinate core handling/storage activities and the packaging/shipment of laboratory samples, including the completion of chains-of-custody and assisting the radiological services contractor in preparing radioactive shipments, if any

Responsibilities and Identification of Key Personnel

These personnel have authority and responsibility to implement this program.

Contractor:	Feezor Engineering, Inc.	
Address:	3377 Hollenberg Drive, Bridgeton, Missouri 63044	
Telephone	Fax	Email
n/a	n/a	n/a
Company Executive responsible for project		Contact No.
Dan Feezor		Direct Line: n/a Cell Phone: 217-836-8842 Email: dfeezor@feezorengineering.com
Manager/Superintendent:		Contact No.
Dan Feezor		Direct Line: n/a Cell Phone: 217-836-8842 Email: dfeezor@feezorengineering.com
Safety Representative/Manager:		Contact No.
Dan Feezor		Direct Line: n/a Cell Phone: 217-836-8842 Email: dfeezor@feezorengineering.com
Key Foreperson or Forepersons:		Contact No.
Jon Wilkinson		Direct Line: n/a Cell Phone: 636-578-8635 Email: jwilkinson@feezorengineering.com
Client Project Management Point of Contact:		Contact No.
Dan Feezor		Direct Line: n/a Cell Phone: 217-836-8842 Email: dfeezor@feezorengineering.com

All managers and supervisors are responsible for implementing and maintaining the SSHEP in their work areas and for answering worker questions about the SSHEP. Managers and supervisors shall make a copy of this SSHEP available to all workers.

Overall Assessment of SH&E Hazards, Exposures, and Risks

Task	Potential Hazards	Mitigation/Response Actions
Location survey assistance	<ul style="list-style-type: none"> - Traversing uneven terrain - Radiological exposure inside Areas 1/2 - Vehicular traffic at locations near roads 	<ul style="list-style-type: none"> - Be alert to surroundings - Follow RWP and/or site PPE requirements - Hi-vis outerwear, traffic control equipment
Construction assistance	<ul style="list-style-type: none"> - Noise - Heavy equipment - Muscle strain - Radiological exposure inside Areas 1/2 	<ul style="list-style-type: none"> - Use hearing protection - Stay >15 ft from equipment and be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Follow RWP and/or site PPE requirements, utilize dust suppression
Drilling oversight	<ul style="list-style-type: none"> - Noise - Heavy equipment - Muscle strain - Rotating equipment/pinch points - Falling objects - Radiological exposure from excavated materials, open boreholes 	<ul style="list-style-type: none"> - Use hearing protection - Stay >15 ft from equipment and be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Watch moving parts, overhead activity - Follow RWP and/or site PPE requirements, utilize dust suppression
Field notes/documentation	<ul style="list-style-type: none"> - Inattentiveness/distraction - Radiological exposure inside Areas 1/2 	<ul style="list-style-type: none"> - Stay alert to surroundings at all times - Follow RWP and/or site PPE requirements
Rad services assistance	<ul style="list-style-type: none"> - Muscle strain - Radiological exposure from excavated materials, open boreholes 	<ul style="list-style-type: none"> - Use safe lifting technique/ergonomics - Follow RWP and/or site PPE requirements
Borehole abandonment assistance	<ul style="list-style-type: none"> - Noise - Heavy equipment - Rotating equipment/pinch points - Falling objects - Radiological exposure inside Areas 1/2 	<ul style="list-style-type: none"> - Use hearing protection - Stay >15 ft from equipment and be alert to operators' limited visibility - Watch moving parts, overhead activity - Follow RWP and/or site PPE requirements
Decontamination support	<ul style="list-style-type: none"> - Splashing liquids - Muscle strain - Slips, trips, falls 	<ul style="list-style-type: none"> - Splash shields, spray control/avoidance - Use safe lifting technique/ergonomics - Watch footing, use slip-resistant equipment
Core logging/sampling	<ul style="list-style-type: none"> - Muscle strain - Radiological exposure from cores 	<ul style="list-style-type: none"> - Use safe lifting technique/ergonomics - Follow RWP PPE requirements - Dampen cores to shield alpha decay
Core scanning assistance	<ul style="list-style-type: none"> - Radiological exposure from cores 	<ul style="list-style-type: none"> - Follow RWP PPE requirements
Core/sample management	<ul style="list-style-type: none"> - Muscle strain - Rad exposure from cores/samples 	<ul style="list-style-type: none"> - Use safe lifting technique/ergonomics - Follow RWP PPE requirements

Activities shall be evaluated and activity hazards analyses (AHAs) or other effective risk management process shall be developed. AHAs and other risk management processes are included in this SSHEP and the associated PSHEP.

SH&E Compliance Programs

Feezor Engineering, Inc. shall comply with relevant SH&E laws and regulations. Written compliance programs shall be implemented on our job sites and coordinated with other site contractors, our lower-tier subcontractors, and with Parsons, as appropriate. Our employees shall be aware of these programs, receive adequate training, and perform their work consistent with these compliance programs where applicable. Programs include but are not limited to:

- 40-Hr Hazardous Waste Operations & Emergency Response certification (HAZWOPER) in accordance with 29 CFR 1910.120 (administered by others)
- 8-Hr HAZWOPER Refresher certification within the preceding 12 months in accordance with 29 CFR 1910.120(e) and (p) (administered by others)
- Bridgeton Landfill Contractor Safety Orientation certification within the preceding 12 months (administered by Matt Stewart-Environmental Manager, Bridgeton Landfill 314-656-2130)
- Radiation Safety certification in general accordance with recommendations for instructional training described in Federal Register 52:17 p. 2832 (administered by others)
- A valid Contractor Permit issued by the Missouri Department of Natural Resources-Division of Geology and Land Survey (administered by MDNR-DGLS 573-368-2165)
- Asbestos Inspector training in accordance with Missouri 10 CSR 10-6.250 and certification within the preceding 12 months by the Missouri Department of Natural Resources-Air Pollution Control Program (administered by MDNR-APCP 573-751-4817)
- Feezor Engineering, Inc. Voluntary Respiratory Protection Program for Bridgeton/West Lake Landfills in accordance with 29 CFR 1910.134. See **Appendix 1** for program documentation.

SH&E Compliance Training Matrix and Training / Education Processes

All workers, including managers and supervisors, shall receive competent and relevant site-specific SH&E training. This training shall include site-specific SH&E compliance training and general site training on SH&E best practices. Our employees shall be properly prepared for conducting their work and shall comply with the relevant SH&E programs and general site-specific SH&E practices.

A written training matrix shall be established and maintained that identifies the workers (by name or by title/role), all of the SH&E-related training they must have, and the frequency for refresher (if needed).

Training shall be provided:

- When the SSHEP is established;
- To all new workers;
- To all workers with new job assignments for which training has not been previously provided;
- When new substances, processes, procedures, or equipment are introduced to the workplace and represent a new hazard, potential exposure, or risk;
- When the employer is made aware of a new or previously unrecognized hazard, exposure, or risk;
- To familiarize supervisors with the SH&E hazards, exposures, or risk to which workers under their immediate direction and control may be exposed; and
- To all workers for hazards, exposures, or risks specific to their job assignment and in compliance with related SH&E compliance programs.

Workplace safety and health practices for all work locations shall include, at a minimum:

- An explanation of the SSHEP, the Parsons Project Safety, Health, and Environmental Plan (PSHEP), the site’s emergency action plan and fire prevention plan, and the measures to report unsafe conditions, work practices, injuries, and/or a recognized need for additional instruction;
- The general purpose, availability, use, limitations, and disposal of outerwear and personal protective equipment;
- Locations of sanitation, hand-washing, and drinking water facilities;
- Provisions for medical services and first aid, including emergency procedures;
- Response procedures for environmental spills or releases; and
- Specific instructions to workers on hazards unique to their job assignment to the extent such information is not covered in other training.

License/Certification	Employee
OSHA HAZWOPER 40-hr + 8-Hr Refresher	B. Abernathy, D. Feezor, D. Hale, A. Roberts, M. Spurgeon, B. Vits, A. Weber, J. Wilkinson, A. Wyatt, M. Humphreys, P. Linscott

Missouri Asbestos Inspector	B. Abernathy, B. Vits, A. Weber, J. Wilkinson, D. Hale, P. Linscott
Missouri Well Contractor's Permit	B. Abernathy, J. Wilkinson
Radiation Safety or Awareness Training	B. Abernathy, D. Feezor, D. Hale, A. Roberts, M. Spurgeon, B. Vits, A. Weber, J. Wilkinson, A. Wyatt
Missouri RG	B. Abernathy
Bridgeton LF Annual H&S	B. Abernathy, D. Feezor, D. Hale, A. Roberts, M. Spurgeon, B. Vits, A. Weber, J. Wilkinson, A. Wyatt
Radiation Safety Officer 40-hr Certification	B. Abernathy, J. Wilkinson

Site-specific Worker Orientation Program

All new workers on our jobsite shall receive site-specific orientation training before conducting their work. This training shall consist of SH&E compliance training and general site SH&E practices related to their work.

Employees completing orientation shall acknowledge in writing completing and understanding the site-specific orientation subject matter. Employees who do not understand one or more subjects shall be retrained.

Site orientation training is provided by Matt Stewart-Environmental Manager, Bridgeton Landfill.

Identification of Competent / Qualified Persons

Contractor Competent Person Certification (United States)

Definition					
A competent person is a formally-designated person having the ability to recognize existing and predictable hazards and has the authority to correct them.					
Responsibility					
The designated contractor competent person is responsible for recognizing and correcting SH&E risks/hazards. This person has the authority to stop work due to a perceived SH&E concern on the jobsite. This contractor manager and designated competent person are considered field contacts for Parsons projects.					
This form shall be completed by each contractor manager and the contractor-designated competent person. Where a contractor is responsible for multiple crafts, it will be necessary to maintain additional designated competent persons and forms. Each contractor on a Parsons project shall submit this completed form to the Parsons project manager before beginning work on the project and must update it any time the designated competent person changes.					
Acknowledgment					
I, <u> Dan Feezor </u> representing, <u> Feezor Engineering, Inc. </u>					
Contractor Manager (Printed)			Contractor Company Name (Printed)		
have assigned <u> Bill Abernathy </u> to be the competent person in the areas indicated and					
Contractor Competent Person (Printed)					
I acknowledge that this individual has been thoroughly trained, is experienced in hazard recognition, and has the authority to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.					
_____			_____		
Contractor Manager (Signature)			Date		
I acknowledge that I have been thoroughly trained and have the experience to perform the duties as the competent person in the areas marked below, and I understand that I have the responsibility and authority to correct hazards and to stop work in the event of a potential hazardous or imminent danger situation.					
_____			_____		
Contractor Competent Person (Signature)			Date		
(Check the areas in which the designated competent person is permitted to execute the role of Contractor Competent Person.)					
<input checked="" type="checkbox"/>	Air Pollution and Emissions	<input checked="" type="checkbox"/>	Environmental Assessments	<input type="checkbox"/>	Mechanical Demolition
<input checked="" type="checkbox"/>	Asbestos	<input type="checkbox"/>	Excavations and Trenches	<input type="checkbox"/>	Protected Ecological and Cultural Resources
<input type="checkbox"/>	Bolting, Riveting, and Fitting	<input type="checkbox"/>	Fall Protection	<input type="checkbox"/>	Resource Conservation
<input type="checkbox"/>	Buried Items	<input type="checkbox"/>	First Aid and CPR	<input checked="" type="checkbox"/>	Respiratory Protection
<input type="checkbox"/>	Concrete, Forms, and Shoring	<input type="checkbox"/>	Hearing Protection	<input type="checkbox"/>	Rigging
<input type="checkbox"/>	Cranes and Derricks	<input type="checkbox"/>	Ladders	<input type="checkbox"/>	Scaffolding
<input type="checkbox"/>	Demolition	<input type="checkbox"/>	Lead	<input type="checkbox"/>	Tunnels and Shafts
<input checked="" type="checkbox"/>	Drinking Water	<input checked="" type="checkbox"/>	Management of Hazardous Materials and Hazardous Solid Wastes	<input type="checkbox"/>	Underground Construction
<input type="checkbox"/>	Electrical			<input checked="" type="checkbox"/>	Wastewater
<input checked="" type="checkbox"/>	Emergency Response to Spills and Releases	<input type="checkbox"/>	Marine Work and Diving	<input type="checkbox"/>	Welding and Cutting
		<input type="checkbox"/>	Material and Personnel Hoists		
<input type="checkbox"/>	Other				

Applicable certifications for FEI Contractor Competent Person Bill Abernathy are attached as **Appendix 2**.

Hazard Identification, Notification, and Correction Process

Each employee is the critical leader for preventing injuries, illnesses, and adverse environmental impacts, Achieving SH&E excellence requires a personal commitment. Therefore, each employee is authorized to stop work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the work stoppage to the other affected stakeholders and further evaluate the condition and adjust the work plan to resolve the safety, health, or environmental concern before restarting the work.

Each employee shall understand that he or she has the **authority** and the **responsibility** to stop work at any time when he or she notices an unplanned or unexpected issue that he or she believes will adversely affect the project's safety, health, or environmental risk. This concept is consistent Parsons SH&E core value.

There is no circumstance where retribution may be directed toward an employee who conscientiously exercised his or her stop work authority.

When should work be stopped? Here are some examples.

- An unsafe act is observed.
- An unsafe condition is observed in the work area.
- An incident or near miss occurs in the work area.
- There is an emergency.
- Alarms sound.
- There is a change in the planned work conditions.
- There is a change in the planned personnel associated with the work.
- There is a change in the planned in scope of work.
- A change is needed in the work plan.
- One or more personnel associated with the work task appear to be confused or demonstrate that they do not understand one or more parts of the work plan.
- Someone believes that personnel, the environment, facilities, or equipment, is exposed to an unacceptable level of risk.

Unsafe, unhealthful, or environmentally damaging work conditions, practices, or procedures shall be corrected in a timely manner based on the severity of the risk posed.

Specific Hazard and Risk Control Measures

Activities shall be evaluated by workers and other subject matter experts to determine the appropriate hazard and risk controls that shall be implemented when performing the activity. In most cases, formal activity hazard analyses (AHAs) shall be communicated and used; however, some activities may require more sophisticated risk management schemes.

See **Appendix C** of the main PSHEP for Job Safety Analyses/Activity Hazard Analyses developed for specific OU-1 site activities.

Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions

The risk mitigation 2-week look ahead form, below, will be used to plan integrated risk mitigation strategies at weekly progress meetings.

SH&E Risk Mitigation 2-week Look-ahead Form			
SH&E Plan for Week Ending:		Contractor:	
Project/ Location:		Meeting Date:	
Plan Prepared by:		Dated:	
Next Two Weeks' Scope of Work:			
Identified SH&E Risks/Exposures/Hazards Issues:			
Identify Tasks requiring environmental construction permitting (e.g., stormwater permit) or involving other environmental regulatory issues (e.g., generation of new, uncharacterized waste):			
Tasks with environmental risk of significant spills or releases:			
Control Measures:			
Additional Activity Hazards Analysis Required:			
Contractors and Subcontractors Mobilizing/Demobilizing:			
Audits/Inspections Scheduled:			
Competent Person Changes:			
Planned Orientation/Training:			
Recommendations/Comments/Concerns:			
Note: This information shall be incorporated into the meeting minutes.			

Employee Participation and Consultation

Open, two-way communication between the leadership team and line employees on SH&E issues is essential to an injury-free, productive, and environmentally sound workplace. The following system provides for the flow of SH&E information.

- Continually maintaining an environment where any worker can report SH&E concerns without any risk of retribution.
- A collaborative approach to resolving worker SH&E concerns, using worker knowledge and experience in developing appropriate risk control measures.
- New worker orientation, including specific orientation to SH&E policies and procedures
- Reviews of the SSHEP and the Parsons PSHEP
- Workplace SH&E training programs
- Regular SH&E meetings
- Posted or distributed SH&E information (awareness program)
- Procedures to anonymously inform SH&E management of workplace hazards, exposures, or risks
- An employee (or labor/management) SH&E committee that: 1) meets regularly and prepares written records, 2) reviews results of periodic scheduled inspections, 3) reviews incident investigations, 4) assesses work risk, 5) reviews reports of hazards, exposures, or adverse environmental conditions, and 6) makes suggestions to management to prevent future incidents.

Emergency Action Plan

Emergency Action planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 3**) and Site Management Plan (**Appendix 4**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 5**).

Site-specific Medical Emergency Plan

Medical Emergency planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Incident Reporting, Investigation, and Corrective Action Processes

Incident reporting, investigation, and corrective action strategies for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Work Site Inspection and Program Audit Process

Site SH&E inspections shall be performed by one or more knowledgeable employees prior to beginning work each day in areas where work will take place during the shift. Designated competent persons shall perform frequent inspections and assessments of the areas and activities under their oversight throughout the day. Deficiencies shall be corrected as soon as possible.

The superintendent or project manager shall perform documented weekly SH&E inspections of all work sites. Deficiencies shall be tracked to closure in a timely manner.

The following SH&E inspections shall be performed. Findings shall be tracked to timely closure.

Competent Person / Inspector	Area of Responsibility	Frequency
Dan Feezor	Tailgate Health & Safety Meetings	Daily
Jon Wilkinson	Tailgate Health & Safety Meetings	Daily
Dane Hale	Tailgate Health & Safety Meetings	Daily
Bill Abernathy	JSA development/distribution	As needed
Jon Wilkinson	Work Site H&S inspections	Daily
Dan Feezor	Tailgate Health & Safety Meetings	Twice weekly
Jon Wilkinson	Areas 1/2 Cover Inspections	Monthly

The following compliance programs shall be reviewed and audited. Findings shall be tracked to timely closure.

Reviewer / Auditor	Compliance Program	Frequency

Progressive Disciplinary Program

Feezor Engineering, Inc. does not maintain a Progressive H&S Disciplinary Program.

Recordkeeping / Document Retention Processes

All records shall be maintained no less than 3 years beyond the end of the contracted work, unless a longer period of retention is required by a regulatory agency.

Feezor Engineering, Inc.'s SH&E document retention process for the site is limited to:

- Electronic retention of licensing, certification, and training records of FEI field staff;
- Retention of SDS's for materials stored or used in the course of routine FEI OU-1 work;
- Review and retention of Health & Safety plans and employee training records provided by OU-1 subcontractors where applicable; and
- Retention of medical respirator approval forms and fit testing results for employees who voluntarily participate in FEI's Respiratory Protection Program for West Lake Landfill.

Appendix 1



FEI Initial Respirator Training - Overview

Feezor Engineering, Inc. has developed a Respiratory Protection Program (RPP) for work-related activities at the Bridgeton/West Lake Landfills. The RPP, developed in accordance with OSHA's Respiratory Protection Standard (29 CFR 1910.134), is applicable to any FEI employee who has the potential to encounter respiratory hazards during operations conducted at these landfills and associated properties. Potential hazards include radiologically-impacted materials (RIM), asbestos-containing materials (ACM), methane, hydrogen sulfide, carbon monoxide, volatile organic compounds (VOCs), and particulates.

Air monitoring at Bridgeton/West Lake has indicated that concentrations of potential respiratory hazards are below values requiring respiratory protection, therefore the RPP is based on voluntary use of respiratory protection by the company's employees. The RPP's purpose is to ensure that any company employee who voluntarily uses a respirator does so in a manner that is appropriate and protective.

The OSHA standard requires FEI to provide respirator training to any employee before he/she uses their respirator on the job for the first time. The OSHA Standard specifies that the training will discuss/explain the contents of the RPP, the employee's responsibilities under it, and the standard itself. The training must be comprehensive and understandable such that employees can demonstrate knowledge of the following:

- Why the respirator is necessary and how its protective effect can be compromised;
- What the limitations and capabilities of the respirator are;
- How to use the respirator effectively in emergency situations, i.e. respirator malfunction;
- How to inspect, put on and remove, use, and check the seals of the respirator;
- What the procedures are for maintenance and storage of the respirator; and
- How to recognize medical signs/symptoms that may limit or prevent effective use.

Company asbestos inspectors will maintain their annual accreditation by participating in any required third-party asbestos hazard and/or respirator training, in addition to participating in the Company's respirator training (in-house or contracted).

Company employees will be re-trained annually or more frequently as needed (i.e. change in work area conditions or hazards, change in respirator type, etc.). Company employees must demonstrate their understanding of the topics covered in the initial training through hands-on exercises and a written test. Respirator training will be documented by the RPA and will include the make, model, type, and size of each respirator for which an employee has been trained and fit tested. If the RPA or an employee's supervisor observes that an employee displays deficiencies in knowledge or understanding of proper respirator use after satisfactory completion of the described training, those deficiencies will be addressed, if necessary, by re-training and validation.

This module has been developed to satisfy FEI's initial respirator training requirement for a voluntary program. The module consists of a copy of the company's RPP for Bridgeton/West Lake Landfills, links to a series of training videos, and a written test to be used to gauge the effectiveness of the initial training.

Should you have any questions regarding this initial respirator training module, please contact FEI's Respiratory Program Administrator (Bill Abernathy) at 314-502-1299 or babernathy@fezorengineering.com at your convenience.

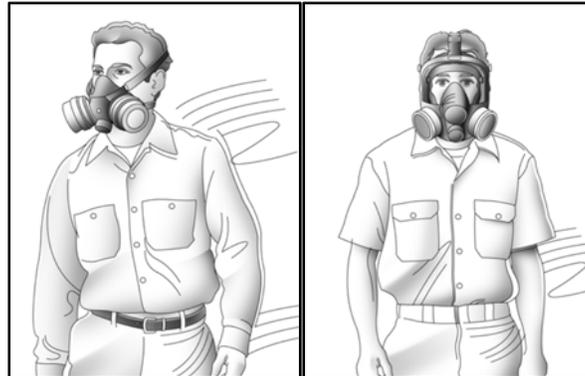
Respiratory Protection Program

Bridgeton/West Lake Landfills Bridgeton, Missouri

for

Feezor Engineering Inc.

406 E. Walnut Street
Chatham, IL 62929



PROGRAM CONTENTS

<u>Section</u>	<u>Topic</u>	<u>Pages</u>
I	Respiratory Protection Program	1-15
II	29 CFR 1910.134 including Appendices A, B-1, B-2, C, and D	16-69
III	Air Sampling Report (TO-15)	70-76

Section I

Respiratory Protection Program

A. Purpose

Feezor Engineering, Inc. (the Company) has determined that employees have the potential to encounter respiratory hazards during operations conducted at Bridgeton Landfill and West Lake Landfill, and associated properties, and at other landfill facilities. The potential hazards at Bridgeton/West Lake Landfills (the Facilities) include, but may not be limited to, radiologically-impacted materials (RIM), asbestos-containing materials (ACM), methane, hydrogen sulfide, carbon monoxide, volatile organic compounds (VOCs), and particulates encountered during drilling, excavation, sampling, monitoring, inspection, and other activities. The Company considers the likelihood of encountering such hazards at the Facilities, at concentrations requiring respiratory protection, to be minimal. The purpose of this program is to ensure that all Company employees who voluntarily use respirators do so in a manner that is appropriate and protective. Company employees who are credentialed Asbestos Inspectors will be required to use respiratory protection when collecting bulk samples of suspect ACM.

This document is designed to comply with OSHA 29 CFR 1910.134, which requires a written Respiratory Protection Program for those employees who will wear respirators while working, whether mandatory or voluntary, and with relevant sections of the OSHA Asbestos Standard for Construction 29 CFR 1926.1101. This program applies to employees of the Company only. It does not apply to contractors or other employers performing work at the Facilities. Contractor requirements for respiratory protection and general health and safety, as applicable, are to be addressed in project contracts.

Engineering controls and work practices designed to minimize employee exposure are the first line of defense at the Company. In outdoor situations at the Facilities where the likelihood of encountering an intransient, actionable level of a given respiratory hazard is low, most engineering controls are not feasible. If unforeseen circumstances or emergencies are encountered, respirators and other appropriate protective equipment will be required as long as the potential hazard exists.

B. Scope and Application

This program applies to all Company employees who voluntarily wear a respirator (i.e. when a respirator is not required) during performance of non-ACM related activities at the Facilities, including drilling, soil and/or waste sampling, groundwater and/or leachate sampling, excavation work, and examining/logging core samples. These employees are subject to the medical evaluation, fit testing, training, and respirator cleaning/maintenance/storage requirements of this program and must be provided with information pertaining to the requirements and resources for the information.

Based on ongoing and anticipated tasks to be performed at the Facilities, the Company does not foresee conditions that would require mandatory use of respirators except for ACM-

related activities as noted previously. In the event that conditions which require respiratory protection are encountered or anticipated, this program would apply to all affected employees.

TABLE 1
RESPIRATOR USAGE

<u>TASK</u>	<u>RESPIRATOR</u>	<u>TYPE USAGE</u>
Trenching/excavation	½ mask or full-face APR w/ P100 cartridge or ½ mask or full-face APR w/ P100+organic vapor cartridge	Voluntary
Drilling	½ mask or full-face APR w/ P100 cartridge or ½ mask or full-face APR w/ P100+organic vapor cartridge	Voluntary
Sampling/logging	½ mask or full-face APR w/ P100 cartridge or ½ mask or full-face APR w/ P100+organic vapor cartridge	Voluntary
ACM bulk sample collection	½ mask or full-face APR w/ P100 cartridge	Mandatory

C. Responsibilities

Program Administrator

The Respiratory Program Administrator (RPA) for the Company is **Bill Abernathy**. The RPA is responsible for administrating the respiratory protection program including the following duties:

- a. Identifying work areas, processes or tasks that may require workers to wear respirators, and evaluating potential respiratory hazards.
- b. Selection of respiratory protection options.
- c. Monitoring respirator use to ensure that they are used in accordance with their certifications.
- d. Arranging for and/or conducting training.
- e. Ensuring proper storage, cleaning, inspections, and maintenance of respiratory protection equipment.
- f. Arranging for and/or conducting qualitative fit testing with a regulatory compliant media (irritant smoke, saccharin, Bitrex®, etc.) or arranging for quantitative fit testing to assess respirator fit by numerical measurement.
- g. Administering the medical surveillance program.
- h. Maintaining records required by the program.
- i. Evaluating the program.
- j. Updating the program as needed.

Supervisors

Supervisors are responsible for ensuring that the respiratory protection program is implemented in their particular areas. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure that the program is understood and followed by the employees under their charge. Duties include:

1. Ensuring employees under their supervision (including new hires) have received the medical evaluation, appropriate initial and annual training, initial and annual fit testing, and appropriate respirators and accessories.
2. Being aware of tasks that may require the use of respiratory protection.
3. Ensuring the availability of appropriate respirators and accessories.
4. Enforcing the proper use of respiratory protection when necessary.
5. Ensuring that respirators are properly cleaned, maintained, inspected, and stored according to the respiratory protection program.
6. Verifying with supervised employees that their respirators do not cause discomfort.
7. Continually monitoring work areas and operations to identify potential respiratory hazards and/or changing conditions.
8. Coordinating with the RPA on how to address respiratory hazards or other concerns that employees may have regarding the program.

Employees

Each Company employee has the responsibility to wear his/her respirator when and where required and in the manner in which he/she was trained. Each employee must also:

1. Care for, maintain, and store his/her respirator(s) as instructed.
2. Inform their supervisor if the respirator no longer fits without discomfort, and request a new one that does.
3. Inform their supervisor or the RPA of any respiratory hazards that he/she feels are not adequately addressed in the workplace and of any other concerns that he/she has regarding the program.
4. Inform their supervisor of the need for a medical reevaluation (for example, if the use of the respirator is causing unusual physical stress).

D. Program Elements

Hazard Assessment and Respirator Selection Procedures

The RPA will select the respirators to be used based on the hazards to which Company employees are expected to be exposed, and in accordance with applicable OSHA standards. The RPA will conduct a hazard evaluation for each operation, process, task, or work area where respiratory hazards may be present in routine operations or during an emergency. The hazard evaluation will include:

- 1) Identification and development of a list of hazardous substances used or likely to be encountered in the work area or during the operation, process, or task.
- 2) Review of work processes to determine where potential exposures to the identified hazardous substances may occur. The review will include surveying the work area, reviewing process records, and talking with employees and supervisors.
- 3) Exposure monitoring to quantify potential hazardous exposures. This hazard assessment task may be performed by a contractor to the Company or delegated to employee(s) who have been or will be adequately trained to perform the monitoring.

Information obtained from exposure monitoring will be tabulated as shown below or in a similar format:

HAZARD ASSESSMENT - (DATE)

	<u>ACTIVITY/TASK</u>	<u>HAZARD</u>	<u>CONCEN</u>	<u>PEL</u>	<u>PRACTICES/CONTROLS</u>
a.	_____	_____	_____	_____	_____
b.	_____	_____	_____	_____	_____
c.	_____	_____	_____	_____	_____

Monitoring data provided by _____

- 4) For ACM bulk sampling activities, if personal air monitoring results from similar projects meeting the requirements of a “Negative Exposure Assessment” are not available, potential exposures will be assumed to be above applicable asbestos PELs.

Records of project monitoring and exposure/hazard assessments will be maintained by the Company. For asbestos-related projects and/or tasks, the records will be maintained for no less than 30 years. Records will be maintained in both hard copy and electronic format unless the RPA determines that electronic format alone is sufficient.

It is not anticipated that protection exceeding that which is provided by negative pressure half mask air-purifying respirators (APRs) will be required during any Company activity. Employees electing to wear respirators or who are required to wear respirators will be allowed to choose from the list of respirators presented in Table 2. The list will be updated periodically to provide a sufficient number of options for the employee. All respirators will be certified by the National Institute for Occupational Safety and Health (NIOSH).

TABLE 2
COMPANY APPROVED RESPIRATORS

<u>BRAND</u>	<u>MODEL or SERIES</u>	<u>STYLE</u>	<u>SIZES</u>
3M	6000 or 7500/6000	½ mask/full face	S, M, L
MSA	Advantage 420/4000	½ mask/full face	S, M, L
North	7700/7600	½ mask/full face	S, M, M/L, L
Scott	Xcel/ProMask 25	½ mask/full face	S, M/L

Updating the Hazard Assessment

The RPA must revise and update the hazard assessment as needed (i.e. new tasks are to be performed, work processes are amended, or other changes to the project or work conditions that may affect potential exposures).

For non-ACM related activities, if a Company employee feels that respiratory protection is needed during a particular activity, and that activity has not been addressed in the hazard assessment for the project, he/she may voluntarily don their respirator while performing the activity and contact their supervisor or the RPA. The RPA will evaluate the potential

hazard associated with the activity (arranging for outside assistance as necessary) if the hazard assessment performed for the project did not already do so. The RPA will communicate the results of the assessment for said activity back to the employee, and if it is determined that respiratory protection may be warranted, the program will be updated accordingly. All other elements of the program will be in effect for previously evaluated tasks/activities while the new activity is being assessed and the program updated.

NIOSH Certification

All respirators must be certified by NIOSH and shall be used in accordance with the terms of that certification. All filters, cartridges, and canisters must be labeled with the appropriate NIOSH-approval label. The label must not be removed or defaced while it is in use.

Voluntary Respirator Use

The Company will provide respirators to its employees for voluntary use during performance of non-ACM related work activities for which respiratory hazards have been assessed. The Company will provide employees (or allow employees to use their own if listed in Table 2) full-face or ½ mask APRs and cartridges appropriate for the evaluated hazards (particulates, radiologically-impacted materials, gases and vapors, etc.).

The RPA will provide all employees who voluntarily choose to wear approved respirators with a copy of Appendix D of 29 CFR 1910.134, which details the requirements for voluntary use of respirators by employees. Employees choosing to wear either a full-face or ½ mask APR must comply with the procedures described in this program for Medical Evaluation, Fit Testing, Respirator Use, Respirator Cleaning, Maintenance/Inspection, Change-Out Schedule, and Storage, and Respirator Training.

The RPA shall authorize voluntary use of respiratory protective equipment as requested by any Company employee performing non-ACM related project activities on a case-by-case basis. Authorization or prohibition of respirator use will be based on 1) an evaluation of specific workplace conditions and 2) the results of the employee's medical evaluation.

Medical Evaluation

Company employees who are either required to wear respirators, or who choose to wear an APR voluntarily (excluding dust masks), must pass a medical examination before being permitted to wear a respirator on the job. Company employees are not permitted to wear respirators to perform job- or project-related work until a physician has determined that they are medically able to do so. Any Company employee refusing the medical evaluation will be prohibited from working in an area or performing a job task requiring respirator use, and from voluntarily wearing a respirator on the job.

For Company employees whose work activities at the Bridgeton/West Lake Landfills may involve respirator use, a licensed physician from a Concentra Medical facility (urgent care

or clinic) will perform the medical evaluations. Medical evaluation procedures are as follows:

- The medical evaluation will be conducted in conjunction with the questionnaire provided in Appendix C of the respiratory protection standard (29 CFR 1910.134). The RPA will provide a copy of this questionnaire to each Company employee requiring a medical evaluation.
- To the extent feasible, the Company will assist any employee who is unable to read the questionnaire. If such assistance is not feasible, the employee will be sent directly to the physician for medical evaluation.
- Each affected employee will be given a copy of the medical questionnaire to complete during their normal work day, on Company time. The employee will also be provided a postage-paid, pre-addressed envelope in which the employee can enclose, seal, and forward the completed questionnaire to the Concentra physician, or he/she may hand-deliver the questionnaire to Concentra personally.
- The RPA will provide the Concentra physician with a copy of the respiratory protection program, a copy of the OSHA standard, the list of potential respiratory hazards for the project, and for each Company employee requiring an evaluation, 1) his/her work area or job title, 2) the approved respirator types and weights, 3) an estimate of how long the employee will be required to wear the respirator on a given day, 4) the expected physical work load (light, moderate, or heavy), 5) the expected temperature and humidity extremes, and 6) a list of any additional protective clothing likely to be required.
- An employee will be granted the opportunity to speak with the physician about his/her medical evaluation, if they so request, at any time prior to, during, or following their examination. Follow-up medical exams will be granted to Company employees as required by the standard, and/or as deemed necessary by the physician. All examinations and questionnaires are to remain confidential between the Company employee and the physician.
- After an employee has received clearance to wear a respirator, and has begun to do so, follow-up medical evaluations will be provided by the Company if:
 1. the employee reports signs or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, or chest pain,
 2. the physician or the employee's supervisor informs the RPA that the employee needs to be re-evaluated,
 3. observations made during fit testing and program evaluation indicate a need for re-evaluation, or
 4. changes occur in workplace conditions that may result in an increased physiological burden on the employee.
- Any employee required for medical reasons to wear a positive pressure air purifying respirator will be provided one by the Company.

A list of Company employees included in medical surveillance and fit testing for respiratory use (except as noted) is provided in Table 3 of this program.

For employees wearing respirators for protection during ACM-related activities, the medical examinations described above will be conducted annually. Alternatively, and additionally, if a Company employee performs ACM-related sample collection activities for no less than 30 days per year, that employee will be given a medical examination meeting the requirements of 29 CFR 1926.1101 (m). Such an examination will be conducted within 10 days of the 30th day of activity.

Fit Testing

Company employees who are required to wear, or voluntarily wear, ½ mask and/or full face APRs will be fit tested:

- prior to wearing any respirator with a tight-fitting faceplate during Company work,
- at least annually, and
- when warranted by changes in the employee's physical condition that may have affected their respirator's fit (e.g. obvious change in body weight, facial scarring, dental work, etc.).

A Company employee will be fit tested using a respirator of the same make, model, and size of the one he/she will actually wear. The employee will be provided with options for the type and size of respirator to be worn in order that he/she may find an optimal fit. Fit testing of powered APR's, if necessary, will be conducted in negative pressure mode.

The RPA or an outside provider may conduct qualitative fit tests (QLFT) following the OSHA-accepted protocol described in Appendix A of 29 CFR 1910.134. A QLFT represents a pass/fail test that assesses the adequacy of the respirator's fit based on an individual's response to a test agent. A QLFT may only be used to fit test a negative-pressure APR (½ mask or full face).

For the subject Facilities, the RPA has determined that quantitative fit tests (QNFT), which assess the adequacy of a respirator's fit by numerically measuring the amount of leakage into the respirator, are **not** required, but may substitute for QLFT if doing so is appropriate. If project or work conditions affecting respirator use change, the RPA will evaluate whether QNFT are required on a case-by-case basis.

Respirator Use

The following Company personnel have undergone medical surveillance and fit testing (except as noted) in accordance with the respiratory protection standard:

TABLE 3
COMPANY PERSONNEL

<u>NAME</u>	<u>TITLE</u>	<u>RESPIRATOR(S) TESTED</u>
Dan Feezor	Project Team Leader	3M 6000 (½ mask)
Bill Abernathy	RPA/Project Geologist	3M 6000 (½ mask)
Paul Eastvold	Project Supervisor	3M 6000 (½ mask)
Brad Vits	Project Eng Technician	(not fit tested)
Matt Stewart	Project Geologist	3M 6000 (½ mask)
Jon Wilkinson	Project Engineer	3M 6000 (½ mask)

General Respirator Use Procedures

- Company employees will use their respirators (voluntarily or as required) while performing the tasks/activities at the Facilities as specified by this program, and in accordance with the training they receive for the respirators they'll be using. The manner in which a respirator is used shall not conflict with the manufacturer's recommendations nor the unit's NIOSH certification.
- Company employees will conduct user seal checks to ensure that an adequate seal is achieved each time the respirator is donned, in accordance with Appendix B-1 of 29 CFR 1910.134. Either the positive and negative pressure checks listed in the appendix, or the respirator manufacturer's recommended user seal check method, will be used. User seal checks are not substitutes for qualitative or quantitative fit tests.
- Company employees will be permitted to leave the work area to 1) clean their respirator (if impeding their ability to work), 2) change filters or cartridges, 3) replace parts, or 4) inspect their respirator if it stops functioning as intended. Employees should notify their supervisor before leaving the area.
- Company employees will be prohibited from wearing tight-fitting respirators (either voluntarily or when required) if they have facial scars, facial hair, or other physical conditions that prevent them from achieving a good seal during their user seal check, even if they were previously fit tested. Employees will be prohibited from wearing headphones, jewelry, eyeglasses, or other articles while using their respirator if doing so prevents them from achieving and maintaining a good seal.

Emergency Respirator Use Procedures

- The OSHA respiratory protection standard defines an emergency situation as any occurrence that may (or does) result in an uncontrolled significant release of an airborne contaminant, such as equipment failure, rupture of containers, or failure of control equipment.
- The RPA has determined that, within the Facilities work areas and during performance of the job tasks specified in Table 1, there currently are no reasonably foreseeable emergency situations as defined by the standard, therefore escape-only respirators will **not** be provided/available for Company employees during work at the Facilities.

Respirator Malfunction

- If malfunction of an APR occurs, i.e. leakage around the faceplate or seals, canister/filter breakthrough, exhalation valve problems, etc., the Company employee must inform his/her supervisor that their respirator does not function as intended and leave the work area. The supervisor will ensure that the malfunction is corrected, or provide the employee with a new respirator approved for the employee to use, before the employee returns to the work area.

Respirator Cleaning, Maintenance/Inspection, Change-Out Schedule, and Storage

Respirator Cleaning

Respirators are to be cleaned regularly and disinfected in an area outside of the work area, such as a job trailer, office, or locker room, or outdoors if weather permits. Since Company respirators are assigned for an employee's exclusive use (or owned by the employee for his/her exclusive use), the employee is responsible for cleaning his/her respirator. Respirators should be cleaned as often as necessary, including whenever visible materials are detected on the respirator, before each use, and at least once each day the respirator is used. Either alcohol-based or alcohol-free wipes can be used for routine cleaning, depending on the respirator manufacturers' recommendations.

The following procedures are to be used when more in-depth cleaning of an employee's respirator is warranted:

- Disassemble the respirator, removing any filters, canisters, or cartridges and setting them aside.
- Wash the faceplate, valves, and other parts in a mild detergent/warm water solution. Do not wash filters/canisters/cartridges. Do not use organic solvents.

- Rinse the washed parts in clean warm water.
- Wipe the washed/rinsed parts with disinfectant wipes containing not less than 70% isopropyl alcohol.
- Air dry the washed/rinsed/wiped parts in a clean area.
- Reassemble the respirator, replacing any defective parts if necessary.
- Reattach filters, canisters, or cartridges if appropriate.
- Place the reassembled respirator in a clean, dry plastic bag or other sealed container.

The RPA will provide appropriate cleaning and disinfection supplies, to be stored in a designated location. If the inventory of supplies becomes limited, employees should contact their supervisor, who will inform the RPA.

Respirator Maintenance/Inspection

Respirators are to be maintained and inspected by Company employees to ensure that they will function properly and provide the intended protection against respiratory hazards when in use. Respirator maintenance includes frequent visual inspections for cleanliness and defects. Worn or deteriorated parts will be replaced prior to use. Replacing or repairing components must be in accordance with the manufacturers' recommendations.

The following components of the Company employee's respirator (whether owned by the employee or provided/assigned to him/her) will be inspected for the noted issues:

- Faceplate or facepiece:
 - cracks, tears, or holes
 - distortion
 - cracked or loose lenses (full face respirators)
- Straps:
 - breaks or tears
 - broken/missing buckles
- Valves:
 - residue or dirt inhibiting seals
 - cracks, tears, or holes in seals/valve material
- Filters/Cartridges :
 - approval designation
 - missing or torn gaskets
 - damaged housings
 - proper filter/cartridge for hazard

Company employees will be permitted to leave the work area to perform minor maintenance on their respirators in an area free of respiratory hazards. Minor

maintenance includes washing the facepiece of skin or eye irritants, replacing filters, cartridges, or canisters, and replacing broken straps. Employees should notify their supervisor before leaving their work area. If an employee detects vapors due to filter/cartridge breakthrough, experiences leakage in the facepiece that cannot be rectified by tightening the straps, or detects any potentially compromising damage to their respirator or its components, they should leave their work area immediately then notify their supervisor of the issue; more in-depth maintenance may be required.

Change-Out Schedules

A change-out schedule details how often filters/cartridges should be replaced if they are being utilized in the work area, and includes the information used to develop the schedule. The service life of a filter/cartridge, defined as the usage period during which it provides adequate protection from respiratory hazards, depends upon factors such as temperature, humidity, an employee's breathing rate, the cartridge's filtering capacity, chemical interferences, and the actual concentrations of respiratory hazards in the work area.

The OSHA respiratory protection standard requires the Company to develop change-out schedule(s) based on available information about the specific work area hazards and conditions, as well as the equipment to be used by its employees. Information may come from sources such as exposure/hazard assessments, cartridge breakthrough test results, mathematical estimates, and/or reliable use recommendations from the respirator/cartridge supplier. Reliance on odor thresholds and other warning properties of the anticipated or actual respiratory hazards, if any, is not allowed to be the primary basis for determining the service life of a cartridge or developing the change-out schedule. Note that the Company's respiratory protection program does not rely on the use of end-of-service-life indicators, therefore respirator filters/cartridges are to be changed in accordance with the usage schedule developed.

(a) Organic Vapor/Acid Gas Cartridges

In developing a change-out schedule for organic vapor/acid gas cartridges, the Company has relied upon the results of air sampling performed at the Facilities on April 5, 2013. The results of the air sampling, performed by Stantec Inc., have been tabulated below, and include the compounds detected in air samples collected upwind and/or downwind of a series of leachate sparge tanks previously located at the Facilities. Samples of ambient air were obtained using evacuated SUMMA canisters and analyzed for compounds by EPA Method TO-15. In cases where a compound was detected in both the upwind sample and the downwind sample, the higher value has been listed.

In the table, an analyte's PEL, or Permissible Exposure Limit, represents OSHA's enforceable limit for exposure of an employee to the analyte, and is a time-weighted average (TWA) for an 8-hour period. RELs are Recommended Exposure Limits

provided by NIOSH, and are recommended 8-hr TWAs intended to limit exposures to hazardous substances in workplace air. They were developed by NIOSH using medical, biological, engineering, chemical, and trade information relevant to a given hazard. Finally, TLVs in the table represent Threshold Limit Values provided by ACGIH, a private, non-governmental scientific association that develops recommendations and guidelines to assist in the control of occupational health hazards. TLVs are health-based values (not legal standards) that are believed by ACGIH to represent conditions under which nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse effects. TLVs, widely recognized as authoritative, have been listed in the table where there are no established PELs or RELs for a given analyte.

Analyte	CAS #	PEL/REL/TLV (mg/m ³)	Result (mg/m ³)
Propene	115-07-1	860 (TLV)	0.0030
DCDFM	75-71-8	4,950 (REL)	0.0022
Chloromethane	74-87-3	207 (PEL)	0.00071
Ethanol	64-17-5	1,900 (REL)	0.0360
Acetone	67-64-1	590 (REL)	0.0370
TCFM	75-69-4	5,600 (REL)	0.0015
Methylene chloride	75-09-2	86 (PEL)	0.00082
2-Butanone (MEK)	78-93-3	590 (REL)	0.0095
Tetrahydrofuran	109-99-9	590 (REL)	0.0041
Benzene	71-43-2	0.3 (REL)	0.0068
Toluene	108-88-3	377 (REL)	0.00073
N-Butanal	123-72-8	73 (TLV)	0.0038
N-Heptanal (Sudan)	85-86-9	not available	0.0026
Propane	74-98-6	1,800 (REL)	0.0033
Isobutane (reported)	75-28-5	1,900 (REL)	0.0031
	(CAS # reported as 13183-68-1 2-Methylpropane-2-d)		
Acetaldehyde	75-07-0	360 (PEL)	0.0028
N-Butane	106-97-8	1,900 (REL)	0.0066
N-Pentane	109-66-0	350 (REL)	0.0027
Methyl acetate	79-20-9	610 (REL)	0.0064
2-Methylfuran (Sylvan)	534-22-5	not available	0.0053
1-Butanol	71-36-3	150 (REL)	0.0043
Cyclohexanone (reported)	108-94-1	100 (REL)	0.0031
	(CAS # reported as 108-93-0 Cyclohexanol)		

Based on the results presented, Company employees who voluntarily wear APRs equipped with organic vapor/acid gas cartridges while performing tasks at the Facilities must change the cartridges on their respirators every 44 hours of use to ensure their continued effectiveness. This value has been assigned in consideration of 1) the lowest listed VOC exposure limit (benzene 0.3 mg/m³), 2) the benzene concentration detected at the site (0.0068 mg/m³), 3) an air consumption rate of about 4 m³ in an 8-hr day, and 4) a safety factor of 2.

(b) Particulate Filters

Company employees who voluntarily wear APRs equipped with P100 particulate filters while performing tasks at the Facilities must change the filters on their respirators when they first begin to experience difficulty breathing (i.e., resistance)

while wearing their respirator. This schedule is based on the NIOSH certification of particulate filters, which states that 1) if oil particles are present in the work area and the filter is to be used for more than one work shift, only a P-series filter may be used, 2) the filters may be used without particle size analysis or filter penetration testing, and 3) service life is non-specific as to time use limitations, due to considerations of hygiene, damage, and breathing resistance. 3M echoes the NIOSH recommendations, stating that their P-series filters should be replaced whenever they become damaged, soiled, or begin to cause noticeably increased breathing resistance.

Respirator Storage

Respirators must be stored in a clean, dry container, and in accordance with the manufacturers’ recommendations. Company employees will clean and inspect their assigned APRs in accordance with the provisions of this program and will store their respirator accordingly. Respirator storage containers (original manufacturer’s packaging, sealable plastic bags or boxes, etc.) will have the employee’s name affixed and will be used to store only that employee’s respirator. Respirators and cartridges/filters will be kept by the RPA at a designated location near the work area. Respirator and cartridge/filter use will be documented per the example below:

Work Area	Employee	Hazard	Conc. (mg/m ³)	Respirator Usage	Est. Service	Storage & Reuse OK?	Change Schedule	Cartridge	# Pairs In Stock
OU1	B. Abernathy	RIM	TBD	5 hrs/day	n/a	Yes	w/ resistance	P100	4
OU1	P. Eastvold	RIM	TBD	2 hrs/day	n/a	Yes	w/ resistance	P100	4
-----	-----	BTEX	0.0075	8 hrs/day	n/a	Yes	44 hrs	OV/AG	6

Respirators or filters/cartridges that are defective will be taken out of service. If a Company employee discovers a defect in his/her respirator during an inspection, the employee will bring it to the attention of his/her supervisor, who in turn will provide the RPA with the defective equipment. The RPA will, at his/her discretion, 1) take the respirator out of service (and tagged out-of-service) until it or its components can be repaired, 2) perform minor repair(s) to the respirator or components and return it to the supervisor, or 3) dispose of the defective respirator (or components) if irreparably damaged, and provide the supervisor with a new one of the same make, model, and style. If a suitable replacement for the irreparably damaged respirator cannot be provided immediately, another make/model/style may be substituted. However, the employee must be fit-tested for the substitute (or provide evidence that he/she has been fit-tested for the replacement unit) if it is different in style (full face vs ½ mask) or size (S vs L) from the damaged/defective unit.

Respirator Training

The RPA will provide or arrange for training for Company employees (and their supervisors) who will voluntarily wear, or be required to wear, respirators. The training will take place prior to the employees/supervisors being allowed to use respirators on the job. Training will discuss/explain the contents of the Company’s respiratory protection

program, the employee/supervisor responsibilities under it, and OSHA's Respiratory Protection Standard. Company asbestos inspectors will maintain their annual accreditation by participating in any required third-party asbestos hazard and/or respirator training, in addition to participating in the Company's respirator training (in-house or contracted).

Respirator training will cover the following topics:

- the Company respiratory protection program contained herein
- general requirements of the OSHA Respiratory Protection Standard
- respiratory hazards and their health effects
- selection and use of respirators
- limitations and capabilities of respirators
- respirator inspection, donning/doffing, and user seal (fit) checks
- qualitative and quantitative fit testing
- effective use in emergency situations
- maintenance and storage
- recognition of medical signs & symptoms that may limit or prevent effective use

Company employees will be re-trained annually or more frequently as needed (i.e. change in work area conditions or hazards, change in respirator type, etc.). Company employees must demonstrate their understanding of the topics covered in the training through hands-on exercises and a written test. Respirator training will be documented by the RPA and will include the make, model, type, and size of each respirator for which an employee has been trained and fit tested. If the RPA or an employee's supervisor observes that an employee displays deficiencies in knowledge or understanding of proper respirator use after satisfactory completion of the described training, those deficiencies will be addressed, if necessary, by re-training and validation.

Disciplinary Action

If the RPA or an employee's supervisor observes a willful violation of the Company's respiratory protection program, such as failure to wear a respirator when required or falsification of respirator records, the Company will issue the employee a written warning. If a second instance occurs, the Company may, at its discretion, issue a second warning or terminate the employee.

E. Program Evaluation

The RPA will conduct periodic evaluations of the work area(s) to ensure that the provisions of this program are being implemented. The evaluations will include regular consultations with employees who use respirators and their supervisors, periodic site inspections, review of air monitoring results if available, and review of respiratory program records.

Problems identified during a program evaluation will be noted in an evaluation log and addressed by the RPA. Findings from the evaluation, and a plan/timeline to correct any deficiencies in the respirator program, will be reported to Dan Feezor.

F. Documentation and Recordkeeping

Written copies of the Company respiratory protection program and the OSHA respiratory protection standard will be kept in the RPA's office and at a designated location near the jobsite. The copies will be available to any Company employee for his/her review.

The RPA will maintain copies of respirator training and fit test records of Company employees. These records will be updated as new employees receive training, as existing employees receive refresher training, and as employees are fit tested. The RPA will maintain copies of medical evaluations containing physicians' signatures attesting to an employee's ability to use a respirator. Medical questionnaires and all physician's findings/records for a Company employee are confidential and for the employee's and doctor's use only.

Section II

OSHA Respiratory Protection Standard

29 CFR 1910.134

This section applies to General Industry (part 1910), Shipyards (part 1915), Marine Terminals (part 1917), Longshoring (part 1918), and Construction (part 1926).

1910.134(a)

Permissible practice.

1910.134(a)(1)

In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this section.

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined in paragraph (c) of this section. The program shall cover each employee required by this section to use a respirator.

1910.134(b)

Definitions. The following definitions are important terms used in the respiratory protection standard in this section.

Air-purifying respirator means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Assigned protection factor (APF) means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.

Atmosphere-supplying respirator means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Demand respirator means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Emergency situation means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-service-life indicator (ESLI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Escape-only respirator means a respirator intended to be used only for emergency exit.

Filter or air purifying element means a component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering facepiece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit factor means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

Helmet means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

High efficiency particulate air (HEPA) filter means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Hood means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Interior structural firefighting means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)

Loose-fitting facepiece means a respiratory inlet covering that is designed to form a partial seal with the face.

Maximum use concentration (MUC) means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

Negative pressure respirator (tight fitting) means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Oxygen deficient atmosphere means an atmosphere with an oxygen content below 19.5% by volume.

Physician or other licensed health care professional (PLHCP) means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

Positive pressure respirator means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered air-purifying respirator (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure demand respirator means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Qualitative fit test (QLFT) means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative fit test (QNFT) means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Respiratory inlet covering means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

Self-contained breathing apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service life means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

Supplied-air respirator (SAR) or airline respirator means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

This section means this respiratory protection standard.

Tight-fitting facepiece means a respiratory inlet covering that forms a complete seal with the face.

User seal check means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

1910.134(c)

Respiratory protection program. This paragraph requires the employer to develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use. The program must be administered by a suitably trained program administrator. In addition, certain program elements may be required for voluntary use to prevent potential hazards associated with the use of the respirator. The Small Entity Compliance Guide contains criteria for the selection of a program administrator and a sample program that meets the requirements of this paragraph. Copies of the Small Entity Compliance Guide will be available on or about April 8, 1998 from the Occupational Safety and Health Administration's Office of Publications, Room N 3101, 200 Constitution Avenue, NW, Washington, DC, 20210 (202-219-4667).

1910.134(c)(1)

In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer shall establish and implement a written respiratory protection program with worksite-specific procedures. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. The employer shall include in the program the following provisions of this section, as applicable:

1910.134(c)(1)(i)

Procedures for selecting respirators for use in the workplace;

1910.134(c)(1)(ii)

Medical evaluations of employees required to use respirators;

[1910.134\(c\)\(1\)\(iii\)](#)

Fit testing procedures for tight-fitting respirators;

[1910.134\(c\)\(1\)\(iv\)](#)

Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;

[1910.134\(c\)\(1\)\(v\)](#)

Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;

[1910.134\(c\)\(1\)\(vi\)](#)

Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;

[1910.134\(c\)\(1\)\(vii\)](#)

Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;

[1910.134\(c\)\(1\)\(viii\)](#)

Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and

[1910.134\(c\)\(1\)\(ix\)](#)

Procedures for regularly evaluating the effectiveness of the program.

[1910.134\(c\)\(2\)](#)

Where respirator use is not required:

[1910.134\(c\)\(2\)\(i\)](#)

An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to this section ("Information for Employees Using Respirators When Not Required Under the Standard"); and

[1910.134\(c\)\(2\)\(ii\)](#)

In addition, the employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. Exception: Employers are not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks).

[1910.134\(c\)\(3\)](#)

The employer shall designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

[1910.134\(c\)\(4\)](#)

The employer shall provide respirators, training, and medical evaluations at no cost to the employee.

[1910.134\(d\)](#)

Selection of respirators. This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The paragraph also

specifies appropriately protective respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators.

1910.134(d)(1)

General requirements.

1910.134(d)(1)(i)

The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

1910.134(d)(1)(ii)

The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.

1910.134(d)(1)(iii)

The employer shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

1910.134(d)(1)(iv)

The employer shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

1910.134(d)(2)

Respirators for IDLH atmospheres.

1910.134(d)(2)(i)

The employer shall provide the following respirators for employee use in IDLH atmospheres:

1910.134(d)(2)(i)(A)

A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or

1910.134(d)(2)(i)(B)

A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

1910.134(d)(2)(ii)

Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

1910.134(d)(2)(iii)

All oxygen-deficient atmospheres shall be considered IDLH. Exception: If the employer demonstrates that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of this section (i.e., for the altitudes set out in the table), then any atmosphere-supplying respirator may be used.

1910.134(d)(3)

Respirators for atmospheres that are not IDLH.

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

1910.134(d)(3)(i)(A)

Assigned Protection Factors (APFs) Employers must use the assigned protection factors listed in Table 1 to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.

Table 1. -- Assigned Protection Factors⁵

Type of respirator ^{1, 2}	Quarter mask	Half mask	Full facepiece	Helmet/ hood	Loose fitting facepiece
1. Air-Purifying Respirator	5	³ 10	50	.....	.....
2. Powered Air-Purifying Respirator (PAPR)	50	1,000	⁴ 25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator	10	50	.....	.....
• Demand mode	50	1,000	⁴ 25/1,000	25
• Continuous flow mode	50	1,000	.....	.....
• Pressure-demand or other positive-pressure mode	50	1,000	.....	.....
4. Self-Contained Breathing Apparatus (SCBA)	10	50	50	.....
• Demand mode	10,000	10,000	.....
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	10,000	10,000	.....

Notes:

¹ Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

² The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

³ This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

⁴ The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

⁵ These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

1910.134(d)(3)(i)(B)

Maximum Use Concentration (MUC)

1910.134(d)(3)(i)(B)(1)

The employer must select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the MUC.

1910.134(d)(3)(i)(B)(2)

Employers must not apply MUCs to conditions that are immediately dangerous to life or health (IDLH); instead, they must use respirators listed for IDLH conditions in paragraph (d)(2) of this standard.

1910.134(d)(3)(i)(B)(3)

When the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.

1910.134(d)(3)(ii)

The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

1910.134(d)(3)(iii)

For protection against gases and vapors, the employer shall provide:

1910.134(d)(3)(iii)(A)

An atmosphere-supplying respirator, or

1910.134(d)(3)(iii)(B)

An air-purifying respirator, provided that:

1910.134(d)(3)(iii)(B)(1)

The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or

1910.134(d)(3)(iii)(B)(2)

If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.

1910.134(d)(3)(iv)

For protection against particulates, the employer shall provide:

1910.134(d)(3)(iv)(A)

An atmosphere-supplying respirator; or

TABLE II

Altitude (ft.)	Oxygen deficient Atmospheres (% O ₂) for which the employer may rely on atmosphere-supplying respirators
Less than 3,001	16.0-19.5
3,001-4,000	16.4-19.5
4,001-5,000	17.1-19.5
5,001-6,000	17.8-19.5
6,001-7,000	18.5-19.5
7,001-8,000 ¹	19.3-19.5

¹ Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet.

1910.134(d)(3)(iv)(B)

An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or

1910.134(d)(3)(iv)(C)

For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

1910.134(e)

Medical evaluation. Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator.

1910.134(e)(1)

General. The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

1910.134(e)(2)

Medical evaluation procedures.

1910.134(e)(2)(i)

The employer shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

1910.134(e)(2)(ii)

The medical evaluation shall obtain the information requested by the questionnaire in Sections 1 and 2, Part A of Appendix C of this section.

1910.134(e)(3)

Follow-up medical examination.

1910.134(e)(3)(i)

The employer shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C or whose initial medical examination demonstrates the need for a follow-up medical examination.

1910.134(e)(3)(ii)

The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

1910.134(e)(4)

Administration of the medical questionnaire and examinations.

1910.134(e)(4)(i)

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.

1910.134(e)(4)(ii)

The employer shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

1910.134(e)(5)

Supplemental information for the PLHCP.

1910.134(e)(5)(i)

The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

1910.134(e)(5)(i)(A)

(A) The type and weight of the respirator to be used by the employee;

1910.134(e)(5)(i)(B)

The duration and frequency of respirator use (including use for rescue and escape);

1910.134(e)(5)(i)(C)

The expected physical work effort;

1910.134(e)(5)(i)(D)

Additional protective clothing and equipment to be worn; and

1910.134(e)(5)(i)(E)

Temperature and humidity extremes that may be encountered.

1910.134(e)(5)(ii)

Any supplemental information provided previously to the PLHCP regarding an employee need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same.

1910.134(e)(5)(iii)

The employer shall provide the PLHCP with a copy of the written respiratory protection program and a copy of this section. Note to Paragraph (e)(5)(iii): When the employer replaces a PLHCP, the employer must ensure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. However, OSHA does not expect employers to have employees medically reevaluated solely because a new PLHCP has been selected.

1910.134(e)(6)

Medical determination. In determining the employee's ability to use a respirator, the employer shall:

1910.134(e)(6)(i)

Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information:

1910.134(e)(6)(i)(A)

Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator;

1910.134(e)(6)(i)(B)

The need, if any, for follow-up medical evaluations; and

1910.134(e)(6)(i)(C)

A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

1910.134(e)(6)(ii)

If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the employer shall provide a PAPR if the PLHCP's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the employer is no longer required to provide a PAPR.

1910.134(e)(7)

Additional medical evaluations. At a minimum, the employer shall provide additional medical evaluations that comply with the requirements of this section if:

1910.134(e)(7)(i)

An employee reports medical signs or symptoms that are related to ability to use a respirator;

1910.134(e)(7)(ii)

A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated;

1910.134(e)(7)(iii)

Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or

1910.134(e)(7)(iv)

A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

1910.134(f)

Fit testing. This paragraph requires that, before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This paragraph specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.

1910.134(f)(1)

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.

1910.134(f)(2)

The employer shall ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter.

1910.134(f)(3)

The employer shall conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

1910.134(f)(4)

If after passing a QLFT or QNFT, the employee subsequently notifies the employer, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested.

1910.134(f)(5)

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of this section.

1910.134(f)(6)

QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.

1910.134(f)(7)

If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

1910.134(f)(8)

Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

1910.134(f)(8)(i)

Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.

1910.134(f)(8)(ii)

Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

1910.134(f)(8)(iii)

Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

1910.134(g)

Use of respirators. This paragraph requires employers to establish and implement procedures for the proper use of respirators. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and establishing procedures for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

1910.134(g)(1)

Facepiece seal protection.

1910.134(g)(1)(i)

The employer shall not permit respirators with tight-fitting facepieces to be worn by employees who have:

1910.134(g)(1)(i)(A)

Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or

1910.134(g)(1)(i)(B)

Any condition that interferes with the face-to-facepiece seal or valve function.

1910.134(g)(1)(ii)

If an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

1910.134(g)(1)(iii)

For all tight-fitting respirators, the employer shall ensure that employees perform a user seal check each time they put on the respirator using the procedures in Appendix B-1 or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as those in Appendix B-1 of this section.

1910.134(g)(2)

Continuing respirator effectiveness.

1910.134(g)(2)(i)

Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the employer shall reevaluate the continued effectiveness of the respirator.

1910.134(g)(2)(ii)

The employer shall ensure that employees leave the respirator use area:

1910.134(g)(2)(ii)(A)

To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use; or

1910.134(g)(2)(ii)(B)

If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece; or

1910.134(g)(2)(ii)(C)

To replace the respirator or the filter, cartridge, or canister elements.

1910.134(g)(2)(iii)

If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, the employer must replace or repair the respirator before allowing the employee to return to the work area.

1910.134(g)(3)

Procedures for IDLH atmospheres. For all IDLH atmospheres, the employer shall ensure that:

1910.134(g)(3)(i)

One employee or, when needed, more than one employee is located outside the IDLH atmosphere;

1910.134(g)(3)(ii)

Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;

1910.134(g)(3)(iii)

The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;

1910.134(g)(3)(iv)

The employer or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue;

1910.134(g)(3)(v)

The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation;

1910.134(g)(3)(vi)

Employee(s) located outside the IDLH atmospheres are equipped with:

1910.134(g)(3)(vi)(A)

Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

1910.134(g)(3)(vi)(B)

Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or

1910.134(g)(3)(vi)(C)

Equivalent means for rescue where retrieval equipment is not required under paragraph (g)(3)(vi)(B).

1910.134(g)(4)

Procedures for interior structural firefighting. In addition to the requirements set forth under paragraph (g)(3), in interior structural fires, the employer shall ensure that:

1910.134(g)(4)(i)

At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times;

1910.134(g)(4)(ii)

At least two employees are located outside the IDLH atmosphere; and

1910.134(g)(4)(iii)

All employees engaged in interior structural firefighting use SCBAs. Note 1 to paragraph (g): One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident. Note 2 to paragraph (g): Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

1910.134(h)

Maintenance and care of respirators. This paragraph requires the employer to provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.

1910.134(h)(1)

Cleaning and disinfecting. The employer shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The employer shall ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2 of this section, or procedures recommended by the respirator manufacturer, provided

that such procedures are of equivalent effectiveness. The respirators shall be cleaned and disinfected at the following intervals:

1910.134(h)(1)(i)

Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;

1910.134(h)(1)(ii)

Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals;

1910.134(h)(1)(iii)

Respirators maintained for emergency use shall be cleaned and disinfected after each use; and

1910.134(h)(1)(iv)

Respirators used in fit testing and training shall be cleaned and disinfected after each use.

1910.134(h)(2)

Storage. The employer shall ensure that respirators are stored as follows:

1910.134(h)(2)(i)

All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and exhalation valve.

1910.134(h)(2)(ii)

In addition to the requirements of paragraph (h)(2)(i) of this section, emergency respirators shall be:

1910.134(h)(2)(ii)(A)

Kept accessible to the work area;

1910.134(h)(2)(ii)(B)

Stored in compartments or in covers that are clearly marked as containing emergency respirators; and

1910.134(h)(2)(ii)(C)

Stored in accordance with any applicable manufacturer instructions.

1910.134(h)(3)

Inspection.

1910.134(h)(3)(i)

The employer shall ensure that respirators are inspected as follows:

1910.134(h)(3)(i)(A)

All respirators used in routine situations shall be inspected before each use and during cleaning;

1910.134(h)(3)(i)(B)

All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and

1910.134(h)(3)(i)(C)

Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

1910.134(h)(3)(ii)

The employer shall ensure that respirator inspections include the following:

1910.134(h)(3)(ii)(A)

A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and

1910.134(h)(3)(ii)(B)

A check of elastomeric parts for pliability and signs of deterioration.

1910.134(h)(3)(iii)

In addition to the requirements of paragraphs (h)(3)(i) and (ii) of this section, self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The employer shall determine that the regulator and warning devices function properly.

1910.134(h)(3)(iv)

For respirators maintained for emergency use, the employer shall:

1910.134(h)(3)(iv)(A)

Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and

1910.134(h)(3)(iv)(B)

Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

1910.134(h)(4)

Repairs. The employer shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures:

1910.134(h)(4)(i)

Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;

1910.134(h)(4)(ii)

Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

1910.134(h)(4)(iii)

Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

1910.134(i)

Breathing air quality and use. This paragraph requires the employer to provide employees using atmosphere-supplying respirators (supplied-air and SCBA) with breathing gases of high purity.

1910.134(i)(1)

The employer shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

1910.134(i)(1)(i)

Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and

1910.134(i)(1)(ii)

Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include: 1910.134(o) Appendices. Compliance with Appendix A, Appendix B-1, Appendix B-2, Appendix C, and Appendix D to this section are mandatory.[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998; 71 FR 16672, April 3, 2006; 71 FR 50187, August 24, 2006; 73 FR 75584, Dec. 12, 2008; 76 FR 33606, June 8, 2011]

1910.134(i)(1)(ii)(A)

Oxygen content (v/v) of 19.5-23.5%;

1910.134(i)(1)(ii)(B)

Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

1910.134(i)(1)(ii)(C)

Carbon monoxide (CO) content of 10 ppm or less;

1910.134(i)(1)(ii)(D)

Carbon dioxide content of 1,000 ppm or less; and

1910.134(i)(1)(ii)(E)

Lack of noticeable odor.

1910.134(i)(2)

The employer shall ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.

1910.134(i)(3)

The employer shall ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

1910.134(i)(4)

The employer shall ensure that cylinders used to supply breathing air to respirators meet the following requirements:

1910.134(i)(4)(i)

Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 180);

1910.134(i)(4)(ii)

Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and

1910.134(i)(4)(iii)

The moisture content in the cylinder does not exceed a dew point of -50 deg.F (-45.6 deg.C) at 1 atmosphere pressure.

1910.134(i)(5)

The employer shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:

1910.134(i)(5)(i)

Prevent entry of contaminated air into the air-supply system;

1910.134(i)(5)(ii)

Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg.C) below the ambient temperature;

1910.134(i)(5)(iii)

Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.

1910.134(i)(5)(iv)

Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.

1910.134(i)(6)

For compressors that are not oil-lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

1910.134(i)(7)

For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.

1910.134(i)(8)

The employer shall ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

1910.134(i)(9)

The employer shall use only the respirator manufacturer's NIOSH-approved breathing-gas containers, marked and maintained in accordance with the Quality Assurance provisions of the NIOSH approval for the SCBA as issued in accordance with the NIOSH respirator-certification standard at 42 CFR part 84.

1910.134(j)

Identification of filters, cartridges, and canisters. The employer shall ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.

1910.134(k)

Training and information. This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. This paragraph also requires the employer to provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the employer to do so.

1910.134(k)(1)

The employer shall ensure that each employee can demonstrate knowledge of at least the following:

1910.134(k)(1)(i)

Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

1910.134(k)(1)(ii)

What the limitations and capabilities of the respirator are;

[1910.134\(k\)\(1\)\(iii\)](#)

How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

[1910.134\(k\)\(1\)\(iv\)](#)

How to inspect, put on and remove, use, and check the seals of the respirator;

[1910.134\(k\)\(1\)\(v\)](#)

What the procedures are for maintenance and storage of the respirator;

[1910.134\(k\)\(1\)\(vi\)](#)

How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

[1910.134\(k\)\(1\)\(vii\)](#)

The general requirements of this section.

[1910.134\(k\)\(2\)](#)

The training shall be conducted in a manner that is understandable to the employee.

[1910.134\(k\)\(3\)](#)

The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

[1910.134\(k\)\(4\)](#)

An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in paragraph (k)(1)(i) through (vii) is not required to repeat such training provided that, as required by paragraph (k)(1), the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

[1910.134\(k\)\(5\)](#)

Retraining shall be administered annually, and when the following situations occur:

[1910.134\(k\)\(5\)\(i\)](#)

Changes in the workplace or the type of respirator render previous training obsolete;

[1910.134\(k\)\(5\)\(ii\)](#)

Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or

[1910.134\(k\)\(5\)\(iii\)](#)

Any other situation arises in which retraining appears necessary to ensure safe respirator use.

[1910.134\(k\)\(6\)](#)

The basic advisory information on respirators, as presented in Appendix D of this section, shall be provided by the employer in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

[1910.134\(l\)](#)

Program evaluation. This section requires the employer to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

1910.134(l)(1)

The employer shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

1910.134(l)(2)

The employer shall regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

1910.134(l)(2)(i)

Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);

1910.134(l)(2)(ii)

Appropriate respirator selection for the hazards to which the employee is exposed;

1910.134(l)(2)(iii)

Proper respirator use under the workplace conditions the employee encounters; and

1910.134(l)(2)(iv)

Proper respirator maintenance.

1910.134(m)

Recordkeeping. This section requires the employer to establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

1910.134(m)(1)

Medical evaluation. Records of medical evaluations required by this section must be retained and made available in accordance with 29 CFR 1910.1020.

1910.134(m)(2)

Fit testing.

1910.134(m)(2)(i)

The employer shall establish a record of the qualitative and quantitative fit tests administered to an employee including:

1910.134(m)(2)(i)(A)

The name or identification of the employee tested;

1910.134(m)(2)(i)(B)

Type of fit test performed;

1910.134(m)(2)(i)(C)

Specific make, model, style, and size of respirator tested;

1910.134(m)(2)(i)(D)

Date of test; and

1910.134(m)(2)(i)(E)

The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

[1910.134\(m\)\(2\)\(ii\)](#)

Fit test records shall be retained for respirator users until the next fit test is administered.

[1910.134\(m\)\(3\)](#)

A written copy of the current respirator program shall be retained by the employer.

[1910.134\(m\)\(4\)](#)

Written materials required to be retained under this paragraph shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

[1910.134\(n\)](#)

Effective date. Paragraphs (d)(3)(i)(A) and (d)(3)(i)(B) of this section become effective November 22, 2006.

Appendix A to § 1910.134: Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures -- General Requirements

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.
2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.
3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.
4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:
 - (a) Position of the mask on the nose
 - (b) Room for eye protection
 - (c) Room to talk
 - (d) Position of mask on face and cheeks
7. The following criteria shall be used to help determine the adequacy of the respirator fit:
 - (a) Chin properly placed;
 - (b) Adequate strap tension, not overly tightened;
 - (c) Fit across nose bridge;
 - (d) Respirator of proper size to span distance from nose to chin;

- (e) Tendency of respirator to slip;
 - (f) Self-observation in mirror to evaluate fit and respirator position.
8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 of this section or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.
 9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.
 10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.
 11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.
 12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.
 13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.
 14. Test Exercises.
 - (a) Employers must perform the following test exercises for all fit testing methods prescribed in this appendix, except for the CNP quantitative fit testing protocol and the CNP REDON quantitative fit testing protocol. For these two protocols, employers must ensure that the test subjects (*i.e.*, employees) perform the exercise procedure specified in Part I.C.4(b) of this appendix for the CNP quantitative fit testing protocol, or the exercise procedure described in Part I.C.5(b) of this appendix for the CNP REDON quantitative fit-testing protocol. For the remaining fit testing methods, employers must ensure that employees perform the test exercises in the appropriate test environment in the following manner:
 - (1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

- (2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
- (3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
- (4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
- (5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

- (6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)
 - (7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.
 - (8) Normal breathing. Same as exercise (1).
- (b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Qualitative Fit Test (QLFT) Protocols

1. General

- (a) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.
- (b) The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

- (a) Odor Threshold Screening - Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.
 - (1) Three 1 liter glass jars with metal lids are required.
 - (2) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.
 - (3) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.
 - (4) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.
 - (5) The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.
 - (6) A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.
 - (7) The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

- (8) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."
- (9) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.
- (10) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.
- (11) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(b) Isoamyl Acetate Fit Test

- (1) The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.
- (2) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.
- (3) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.
- (4) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.
- (5) Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

- (6) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.
- (7) If at any time during the test, the subject detects the banana-like odor of IAA, the test is failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.
- (8) If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.
- (9) If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.
- (10) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

3. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

- (a) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.
 - (1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.
 - (2) The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

- (3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.
- (4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
- (5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.
- (6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.
- (7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.
- (8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.
- (9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.
- (10) The test conductor will take note of the number of squeezes required to solicit a taste response.
- (11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.

Note to paragraph 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

- (12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Saccharin solution aerosol fit test procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure described in 3. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.

(11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

- (12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

4. Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

- (a) Taste Threshold Screening. The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.
- (1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.
 - (2) The test enclosure shall have a $\frac{3}{4}$ inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.
 - (3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.
 - (4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
 - (5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.
 - (6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.
 - (7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste

threshold is noted as ten regardless of the number of squeezes actually completed.

- (8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.
 - (9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.
 - (10) The test conductor will take note of the number of squeezes required to solicit a taste response.
 - (11) If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.
 - (12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.
 - (13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
 - (14) The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.
- (b) Bitrex Solution Aerosol Fit Test Procedure.
- (1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.
 - (2) The fit test uses the same enclosure as that described in 4. (a) above.
 - (3) The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).
 - (4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.
 - (5) The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.

- (6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.
- (7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.
- (8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
- (9) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).
- (10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.
- (11) If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. Irritant Smoke (Stannic Chloride) Protocol

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

(a) General Requirements and Precautions

- (1) The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
- (2) Only stannic chloride smoke tubes shall be used for this protocol.
- (3) No form of test enclosure or hood for the test subject shall be used.
- (4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

- (5) The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.
- (b) Sensitivity Screening Check. The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.
- (1) The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
 - (2) The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.
 - (3) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

(c) Irritant Smoke Fit Test Procedure

- (1) The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).
- (2) The test subject shall be instructed to keep his/her eyes closed.
- (3) The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
- (4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.
- (5) The exercises identified in section I.A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

- (6) If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.
- (7) Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
- (8) If a response is produced during this second sensitivity check, then the fit test is passed.

C. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General

- (a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.
- (b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

(a) Apparatus.

- (1) Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.
- (2) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

- (3) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.
- (4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.
- (5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.
- (6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.
- (7) The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.
- (8) The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.
- (9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.
- (10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.
- (11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.
- (12) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.
- (13) The limitations of instrument detection shall be taken into account when determining the fit factor.

(14) Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

(b) Procedural Requirements.

- (1) When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.
- (2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.
- (3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.
- (4) Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.
- (5) A stable test agent concentration shall be obtained prior to the actual start of testing.
- (6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.
- (7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.
- (8) Calculation of fit factors.
 - (i) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.
 - (ii) The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and

after each exercise or the true average measured continuously during the respirator sample.

(iii) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(A) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(B) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(C) Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

(D) The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

$$\text{Overall Fit Factor} = \frac{\text{Number of exercises}}{1/ff_1 + 1/ff_2 + 1/ff_3 + 1/ff_4 + 1/ff_5 + 1/ff_6 + 1/ff_7 + 1/ff_8}$$

Where ff₁, ff₂, ff₃, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol.

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount™) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling

device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Portacount Fit Test Requirements.

- (1) Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.
- (2) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.
- (3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.
- (4) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.
- (5) Follow the manufacturer's instructions for operating the Portacount and proceed with the test.
- (6) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
- (7) After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

(b) Portacount Test Instrument.

- (1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail

message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

- (2) Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.
 - (3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.
4. Controlled negative pressure (CNP) quantitative fit testing protocol.

The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Occupational Health Dynamics of Birmingham, Alabama also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) CNP Fit Test Requirements.

- (1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.
- (2) The CNP system defaults selected for test pressure shall be set at -- 15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.

(Note: CNP systems have built-in capability to conduct fit testing that is specific to

unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)

- (3) The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.
 - (4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.
 - (5) The employer must train the test subject to hold his or her breath for at least 10 seconds.
 - (6) The test subject must don the test respirator without any assistance from the test administrator who is conducting the CNP fit test. The respirator must not be adjusted once the fit-test exercises begin. Any adjustment voids the test, and the test subject must repeat the fit test.
 - (7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.
- (b) CNP Test Exercises.
- (1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.
 - (2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.
 - (3) Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his or her breath for 10 seconds during test measurement.
 - (4) Moving head up and down. Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her

breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.

- (5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
- (6) Grimace. The test subject shall grimace by smiling or frowning for 15 seconds.
- (7) Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
- (8) Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

(c) CNP Test Instrument.

- (1) The test instrument must have an effective audio-warning device, or a visual-warning device in the form of a screen tracing, that indicates when the test subject fails to hold his or her breath during the test. The test must be terminated and restarted from the beginning when the test subject fails to hold his or her breath during the test. The test subject then may be refitted and retested.
 - (2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.
5. Controlled negative pressure (CNP) REDON quantitative fit testing protocol.
- (a) When administering this protocol to test subjects, employers must comply with the requirements specified in paragraphs (a) and (c) of Part I.C.4 of this appendix ("Controlled negative pressure (CNP) quantitative fit testing protocol"), as well as use

the test exercises described below in paragraph (b) of this protocol instead of the test exercises specified in paragraph (b) of Part I.C.4 of this appendix.

- (b) Employers must ensure that each test subject being fit tested using this protocol follows the exercise and measurement procedures, including the order of administration, described below in Table A-1 of this appendix.

Table A-1. -- CNP REDON Quantitative Fit Testing Protocol

Exercises ⁽¹⁾	Exercise procedure	Measurement procedure
Facing Forward	Stand and breathe normally, without talking, for 30 seconds.	Face forward, while holding breath for 10 seconds.
Bending Over	Bend at the waist, as if going to touch his or her toes, for 30 seconds.	Face parallel to the floor, while holding breath for 10 seconds
Head Shaking	For about three seconds, shake head back and forth vigorously several times while shouting.	Face forward, while holding breath for 10 seconds.
REDON 1	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask.	Face forward, while holding breath for 10 seconds.
REDON 2	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask again.	Face forward, while holding breath for 10 seconds.

¹ Exercises are listed in the order in which they are to be administered.

- (c) After completing the test exercises, the test administrator must question each test subject regarding the comfort of the respirator. When a test subject states that the respirator is unacceptable, the employer must ensure that the test administrator repeats the protocol using another respirator model.
- (d) Employers must determine the overall fit factor for each test subject by calculating the harmonic mean of the fit testing exercises as follows:

$$\text{Overall Fit Factor} = \frac{N}{\left[\frac{1}{FF_1} + \frac{1}{FF_2} + \dots \frac{1}{FF_N} \right]}$$

Where:

N = The number of exercises;

FF1 = The fit factor for the first exercise;

FF2 = The fit factor for the second exercise; and

FFN = The fit factor for the nth exercise.

Part II. New Fit Test Protocols

A. Any person may submit to OSHA an application for approval of a new fit test protocol. If the application meets the following criteria, OSHA will initiate a rulemaking proceeding under section 6(b)(7) of the OSH Act to determine whether to list the new protocol as an approved protocol in this Appendix A.

B. The application must include a detailed description of the proposed new fit test protocol. This application must be supported by either:

1. A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the National Institute for Standards and Technology) stating that the laboratory has tested the protocol and had found it to be accurate and reliable; or
2. An article that has been published in a peer-reviewed industrial hygiene journal describing the protocol and explaining how test data support the protocol's accuracy and reliability.

C. If OSHA determines that additional information is required before the Agency commences a rulemaking proceeding under this section, OSHA will so notify the applicant and afford the applicant the opportunity to submit the supplemental information. Initiation of a rulemaking proceeding will be deferred until OSHA has received and evaluated the supplemental information. [63 FR 20098, April 23, 1998; 69 FR 46993, August 4, 2004]

Appendix B-1 to § 1910.134: User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

- A. *Positive pressure check.* Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.
- B. *Negative pressure check.* Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective. [63 FR 1152, Jan. 8, 1998]

Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

- A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- B. Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.
- D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
 - 1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,
 - 2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,
 - 3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- F. Components should be hand-dried with a clean lint-free cloth or air-dried.
- G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
- H. Test the respirator to ensure that all components work properly.
[63 FR 1152, Jan. 8, 1998]

App C to § 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee: Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A, Section 1. (Mandatory)

The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____
 2. Your name: _____
 3. Your age (to nearest year): _____
 4. Sex (circle one): Male/Female
 5. Your height: _____ ft. _____ in.
 6. Your weight: _____ lbs.
 7. Your job title: _____
 8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____
 9. The best time to phone you at this number: _____
 10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No
 11. Check the type of respirator you will use (you can check more than one category):
 - a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
 - b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
 12. Have you worn a respirator (circle one): Yes/No
- If "yes," what type(s): _____
- _____

Part A, Section 2. (Mandatory)

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you *ever had* any of the following conditions?

a. Seizures: Yes/No

b. Diabetes (sugar disease): Yes/No

c. Allergic reactions that interfere with your breathing: Yes/No

d. Claustrophobia (fear of closed-in places): Yes/No

e. Trouble smelling odors: Yes/No

3. Have you *ever had* any of the following pulmonary or lung problems?

a. Asbestosis: Yes/No

b. Asthma: Yes/No

c. Chronic bronchitis: Yes/No

d. Emphysema: Yes/No

e. Pneumonia: Yes/No

f. Tuberculosis: Yes/No

g. Silicosis: Yes/No

h. Pneumothorax (collapsed lung): Yes/No

i. Lung cancer: Yes/No

j. Broken ribs: Yes/No

k. Any chest injuries or surgeries: Yes/No

l. Any other lung problem that you've been told about: Yes/No

4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?

a. Shortness of breath: Yes/No

b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No

c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No

d. Have to stop for breath when walking at your own pace on level ground: Yes/No

e. Shortness of breath when washing or dressing yourself: Yes/No

f. Shortness of breath that interferes with your job: Yes/No

g. Coughing that produces phlegm (thick sputum): Yes/No

h. Coughing that wakes you early in the morning: Yes/No

i. Coughing that occurs mostly when you are lying down: Yes/No

j. Coughing up blood in the last month: Yes/No

k. Wheezing: Yes/No

l. Wheezing that interferes with your job: Yes/No

m. Chest pain when you breathe deeply: Yes/No

n. Any other symptoms that you think may be related to lung problems: Yes/No

5. Have you *ever had* any of the following cardiovascular or heart problems?

a. Heart attack: Yes/No

b. Stroke: Yes/No

c. Angina: Yes/No

d. Heart failure: Yes/No

e. Swelling in your legs or feet (not caused by walking): Yes/No

f. Heart arrhythmia (heart beating irregularly): Yes/No

g. High blood pressure: Yes/No

h. Any other heart problem that you've been told about: Yes/No

6. Have you *ever had* any of the following cardiovascular or heart symptoms?

- a. Frequent pain or tightness in your chest: Yes/No
- b. Pain or tightness in your chest during physical activity: Yes/No
- c. Pain or tightness in your chest that interferes with your job: Yes/No
- d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
- e. Heartburn or indigestion that is not related to eating: Yes/No
- d. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you *currently* take medication for any of the following problems?

- a. Breathing or lung problems: Yes/No
- b. Heart trouble: Yes/No
- c. Blood pressure: Yes/No
- d. Seizures: Yes/No

8. If you've used a respirator, have you *ever had* any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

- a. Eye irritation: Yes/No
- b. Skin allergies or rashes: Yes/No
- c. Anxiety: Yes/No
- d. General weakness or fatigue: Yes/No
- e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you *ever lost* vision in either eye (temporarily or permanently): Yes/No

11. Do you *currently* have any of the following vision problems?

- a. Wear contact lenses: Yes/No
 - b. Wear glasses: Yes/No
 - c. Color blind: Yes/No
 - d. Any other eye or vision problem: Yes/No
12. Have you *ever had* an injury to your ears, including a broken ear drum: Yes/No
13. Do you *currently* have any of the following hearing problems?
- a. Difficulty hearing: Yes/No
 - b. Wear a hearing aid: Yes/No
 - c. Any other hearing or ear problem: Yes/No
14. Have you *ever had* a back injury: Yes/No
15. Do you *currently* have any of the following musculoskeletal problems?
- a. Weakness in any of your arms, hands, legs, or feet: Yes/No
 - b. Back pain: Yes/No
 - c. Difficulty fully moving your arms and legs: Yes/No
 - d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
 - e. Difficulty fully moving your head up or down: Yes/No
 - f. Difficulty fully moving your head side to side: Yes/No
 - g. Difficulty bending at your knees: Yes/No
 - h. Difficulty squatting to the ground: Yes/No
 - i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
 - j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B.

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

- 1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has

lower than normal amounts of oxygen: Yes/No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No

If "yes," name the chemicals if you know them: _____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

a. Asbestos: Yes/No

b. Silica (e.g., in sandblasting): Yes/No

c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No

d. Beryllium: Yes/No

e. Aluminum: Yes/No

f. Coal (for example, mining): Yes/No

g. Iron: Yes/No

h. Tin: Yes/No

i. Dusty environments: Yes/No

j. Any other hazardous exposures: Yes/No

If "yes," describe these exposures: _____

4. List any second jobs or side businesses you have: _____

5. List your previous occupations: _____

6. List your current and previous hobbies: _____

7. Have you been in the military services? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes," name the medications if you know them: _____

10. Will you be using any of the following items with your respirator(s)?

a. HEPA Filters: Yes/No

b. Canisters (for example, gas masks): Yes/No

c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

a. Escape only (no rescue): Yes/No

b. Emergency rescue only: Yes/No

c. Less than 5 hours *per week*: Yes/No

d. Less than 2 hours *per day*: Yes/No

e. 2 to 4 hours per day: Yes/No

f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

a. *Light* (less than 200 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:
_____ hrs. _____ mins.

Examples of a light work effort are *sitting* while writing, typing, drafting, or performing light assembly work; or *standing* while operating a drill press (1-3 lbs.) or controlling machines.

b. *Moderate* (200 to 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:
hrs. _____ mins.

Examples of moderate work effort are *sitting* while nailing or filing; *driving* a truck or bus in urban traffic; *standing* while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; *walking* on a level surface about 2 mph or down a 5-degree grade about 3 mph; or *pushing* a wheelbarrow with a heavy load (about 100 lbs.) on a level surface. c. Heavy (above 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:
hrs. _____ mins.

Examples of heavy work are *lifting* a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; *shoveling*; *standing* while bricklaying or chipping castings; *walking* up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If "yes," describe this protective clothing and/or equipment: _____

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s): _____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases): _____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____
Name of the second toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____
Name of the third toxic substance: _____
Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

The name of any other toxic substances that you'll be exposed to while using your respirator: _____

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security): _____

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998; 76 FR 33607, June 8, 2011; 77 FR 46949, Aug. 7, 2012]

Appendix D to § 1910.134 (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998]

Section III

Air Sampling Report (TO-15)

Memo



Stantec

To: Craig Almanza
 Bridgeton Landfill, LLC

From: Deborah L. Gray
 Columbus, OH

File: Bridgeton Landfill, LLC

Date: April 9, 2013

Reference: 182608005

At the request of Bridgeton Landfill, LLC Stantec Consulting Services, Inc. (Stantec) mobilized to Bridgeton Landfill in Bridgeton, Missouri, to collect samples of the vapor in the headspace of the leachate treatment tanks to determine the concentrations of volatile organic compounds (VOCs) present following mixing and aeration of the waste. It is Stantec's understanding that the purpose of sampling the vapor is to assess potential exposures to employees of the Metropolitan Sewer District (MSD) during transfer of the treated liquids from the landfill to the MSD lift-station on Old St. Charles Rock Road. The MSD has expressed concern that employees working around the liquid wastes from the landfill may be exposed to airborne contaminants, including VOCs (particularly benzene) at levels of concern in the air of the lift-station structure, and potentially as the wastes enter the mixing tanks at the municipal wastewater treatment plant (approximately 1.5 to 2.0 miles from the landfill).

In order to render the liquid waste (combined leachate and landfill gas condensate) acceptable for discharge through the MSD, Bridgeton will treat the waste by mixing and aerating to reduce the concentrations of VOCs. On Thursday April 4, leachate and landfill gas condensate were transferred into frac tanks for treatment. There are currently two treatment units on-site, each consisting of four frac tanks and an air-sparging system. However, only one unit was operating on April 4/5. Once the tanks were filled above the level of the aeration equipment, approximately 1/3rd, the waste was stirred to release volatiles which were then captured and sparged through charcoal filter units before release to ambient air. After treatment, samples of the liquid waste were collected to confirm that it met the requirements set forth in the leachate treatment Standard Operating Procedure and to provide a baseline analysis for resumption of discharge to the MSD. It was the intent of the facility to sample the vapors in the headspace of the treatment tanks at the same time that the liquid samples were collected in order to have correlating liquid and vapor data for purpose of MSD's review.

It is anticipated that the concentrations of VOCs present in the vapors confined above the liquid in the frac tanks would represent the "worst case" with regard to what MSD employees could be exposed to either in the air inside the lift station or subsequently when the waste enters the municipal treatment plant. This was consistent with the purpose of providing a conservative estimate from which to evaluate risk and appropriate risk abatement options.

One Team. Infinite Solutions.

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Stantec

April 9, 2013
 Craig Almanza
 Page 2 of 3

Reference: 182608005

The vapor sampling will be restricted to VOCs because this analytical group includes compounds that are of greatest potential health concern to those employees of the MSD who may inhale vapors while transferring the waste. The individual compounds that were detected in the highest concentrations in landfill gas during the August 2012 sampling event were VOCs. Although other types of constituents such as reduced sulfur compounds and carboxylic acids were found in the landfill gas in August 2102, these constituents are primarily related to odor as opposed to being a health concern for the conditions under which MSD employees may be exposed to vapors associated with disposal of the liquid waste.

Stantec utilized the following sampling protocol.

Analytical Method: EPA TO-15 plus Tentatively Identified Compounds (TICs)

Collection Method: Vapor or ambient air will be drawn into prepared 6-liter Summa® Canisters fitted with 15-minute regulators.

Vapor Samples from the Headspace of the Treatment Tanks: In order to minimize dilution with ambient air, the canister was placed on the top of the treatment tank and a piece of Tygon® tubing attached to the sample inlet inserted under the metal cover on the access port of the tank so that it extended into the headspace, but did not contact the liquid. To avoid crushing the tubing, the lid was propped open with a small piece of wood and clean toweling was tucked into the opening to prevent influx of outside air or escape of the vapors. The vapor samples were collected over a 15-minute period.

On April 5, 2013 a total of **eight (8) vapor samples** were collected from the headspace of the four frac tanks that were connected to the operating sparge system after treatment. One vapor sample was collected from each of the four tanks with the air filtration unit operating. The air filtration unit was then turned off allowing vapors to accumulate inside the headspace of the tanks for approximately one hour. A second vapor sample was then collected from each of the four frac tanks to represent “worst case” conditions with regard to vapor concentrations.

Outside Air Samples: In addition to the treatment tank vapor samples, **two (2) 15-minute samples of outside air** were collected in the vicinity of the treatment tanks during the same time period for comparison.

Chains of Custody and Shipping: Chain of custody documentation was completed by Stantec personnel and packaged with the filled Summa® Canisters; and shipped via FedEx to ALS Laboratories for arrival on Monday morning (April 8). The laboratory was requested to analyze the samples within 4-days of receipt with results available by Friday April 12.

ALS has indicated that there is a 25% surcharge for 5-day turn-around. This translates to \$237.50 per sample.

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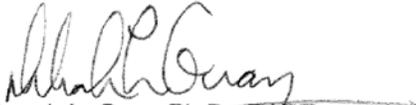
Stantec

April 9, 2013
Craig Almanza
Page 3 of 3

Reference: 182608005

Communication of Results: The laboratory analytical results will be communicated to Bridgeton Landfill, LLC as soon as the reports are received and reviewed by Stantec's toxicologist.

Stantec Consulting Services, Inc.



Deborah L. Gray, Ph.D., DABT
National Director, Risk Assessment & Toxicology Practice
Deb.gray@stantec.com

One Team. Infinite Solutions.

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Table 1: Sample Locations and Parameters – Summa Canisters – Bridgeton Landfill Leachate Processing (Sparge) Tanks

SUMMA Canister ID	Location/Description ^{1,2,3,4}	Analog Gauge ID	COA ID ⁵	Start Time ⁶	Stop Time	Sample Duration (min)	PreSample Pressure (PSI) ⁷	PostSample Pressure (PSI) ⁷	Amount of time tank lid was closed prior to sampling (hr:min) ^{8,9}	Amount of time carbon filtration unit was off prior to sampling (hr:min) ^{9,10}
02705	SPG1-1, carbon filtration system ON	AVG01893	OA00940	0908	0923	15	28.6	0.0	0:13	NA
01545	SPG1-2, carbon filtration system ON	AVG02327	OA01035	0928	0945	17	27.8	2.5	0:26	NA
03275	SPG1-3, carbon filtration system ON	AVG02181	OA00994	1013	1029	16	24.8	1.8	1:09	NA
02229	SPG1-4, carbon filtration system ON	AVG02354	OA00959	1032	1047	15	27.4	0.0	1:26	NA
02836	SPG1-1, carbon filtration system OFF	AVG01821	OA01015	1101	1117	16	28.6	6.2	0:41	0:09
02733	SPG1-2, carbon filtration system OFF	AVG02682	OA00989	1120	1135	15	29.6	6.0	2:18	0:28
01270	SPG1-3, carbon filtration system OFF	AVG02124	OA01048	1138	1153	15	28.8	1.7	2:34	0:46
00404	SPG1-4, carbon filtration system OFF	AVG02550	OA00969	1155	1211	16	27.4	3.0	2:49	1:03
01373	Ambient – upwind	AVG01905	OA00957	0950	1006	16	27.5	5.8	NA	NA
01233	Ambient - downwind	AVG02438	OA00936	1035	1052	17	26.0	0.0	NA	NA

Notes:

- 1 SPG#-# refers to leachate sparge systems; the first # refers to the system on site (at the time of sampling there were 3 separate systems); the second number refers to the tank identification (each sparge system has four separate tanks)
- 2 All samples obtained from SPG1; this was the only system on line that had leachate present that was previously sparged, thereby simulating that which would be discharged to MSD
- 3 For SPG1, the four tanks were filled with leachate on 04/04/2013 starting at 1330 and ending at 2250
- 4 For SPG1, the sparge system was turned on 04/04/2013 at 1830, and turned off on 04/05/2013 at approximately 0900; thus it operated for approximately 14.5 hours (Source: Feezor Engineering)
- 5 COA = Critical Orifice Assembly
- 6 All samples obtained on April 5, 2013; weather was clear and sunny with light breeze from northeast, approximate temperature 65°F
- 7 PSI = pounds per square inch
- 8 To minimize air movement and approximate worst-case conditions, the lids to SPG1 tanks were closed for sampling at the following times: SPG1-1 at 0855 (and again at 1020); SPG1-2 at 0902; SPG1-3 at 0904; SPG1-4 at 0906
- 9 NA = not applicable
- 10 To minimize air movement and approximate worst-case conditions for the second round of samples from the four SPG1 tanks, the carbon air filtration unit was shut down at 1052

Stantec
Project Number 182608005

Table 2: Sample Results - Summa Canisters – Bridgeton Landfill Leachate Processing (Sparge) Tanks

Analyte	CAS #	Concentrations in µg/m ³										
		Occupational Standard*	SPG-1 On (Summa 02705)	SPG-2 On (Summa 01545)	SPG-3 On (Summa 03275)	SPG-4 On (Summa 02229)	SPG-1 Off (Summa 02836)	SPG-2 Off (Summa 02733)	SPG-3 Off (Summa 01270)	SPG-4 Off (Summa 00404)	Ambient Upwind (Summa 01373)	Ambient Downwind (Summa 01233)
Propene	115-07-1	861,000	490	300	720	330	3,100	760	2,400	2,400	<0.65	3.0
DCDFM	75-71-8	42,100	<43	<48	<83	<53	<190	<390	<230	<470	2.2	2.1
Chloromethane	74-87-3	207,000	<43	<48	<83	<53	<190	<390	<230	<470	0.71	<0.67
Ethanol	64-17-5	1,880,000	31,000	25,000	40,000	26,000	91,000	92,000	110,000	110,000	<6.5	36
Acetone	67-64-1	590,000	23,000	19,000	32,000	19,000	110,000	90,000	120,000	130,000	11	37
TCFM	75-69-4	5,620,000	<43	<48	<83	<53	<190	<390	<230	<470	1.3	1.5
2-Propanol	67-63-0	980,000	4,700	4,200	6,500	4,200	14,000	18,000	19,000	22,000	<6.5	<6.7
Methylene chloride	75-09-2	174,000	<43	<48	<83	<53	<190	<390	<230	<470	0.82	<0.67
2-Butanone (MEK)	78-93-3	590,000	8,800	8,200	14,000	8,100	49,000	42,000	61,000	68,000	<6.5	9.5
Ethyl acetate	141-78-6	1,440,000	330	320	640	330	2,400	1,900	3,000	3,800	<1.3	<1.3
Tetrahydrofuran	109-99-9	147,000	4,300	3,900	7,000	3,900	25,000	20,000	28,000	35,000	<0.65	4.1
Benzene	71-43-2	1,600	<43	<48	<83	<53	<190	<390	<230	<470	<0.65	6.8
1,4-Dioxane	123-91-1	3,600	350	280	470	300	1,000	1,100	1,300	1,400	<0.65	<0.67
4M2P	108-10-1	205,000	150	130	270	140	850	730	1,200	1,500	<0.65	<0.67
Toluene	108-88-3	75,400	<43	<48	<83	<53	<190	<390	<230	<470	0.73	<0.67
2-Hexanone	591-78-6	4,000	130	130	230	130	730	640	970	1,200	<0.65	<0.67
n-Butyl acetate	123-86-4	710,000	180	180	390	200	1,000	920	1,900	2,400	<0.65	<0.67
124TMB	95-63-6	125,000	<43	<48	<83	<53	<190	<390	280	<470	<0.65	<0.67
14DCB	106-46-7	450,000	<43	<48	<83	<53	<190	<390	370	570	<0.65	<0.67
d-Limonene	5989-27-5	167,000	83	86	110	72	640	<390	660	990	<0.65	<0.67
Naphthalene	91-20-3	52,400	350	350	260	180	410	<390	780	1,100	<0.65	<0.67

Tentatively Identified Compounds

Sulfur dioxide	7446-09-5		ND	ND	ND	ND	ND	ND	ND	ND	>440	ND
n-Butanal	123-72-8		ND	ND	ND	ND	4,400	4,000	ND	8,100	3.8	ND
n-Heptanal	85-86-9		ND	ND	1,300	ND	ND	ND	ND	ND	2.6	ND

Propane	74-98-6	1,800,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3
Isobutane	13183-68-1		ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1
Acetaldehyde	75-07-0	45,000	1,800	1,700	3,000	1,700	10,000	9,000	12,000	15,000	ND	2.8
Methyl acetate	79-09-4	610,000	4,400	4,100	7,800	4,200	28,000	23,000	33,000	41,000	ND	ND
n-Butane	106-97-8	1,900,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.6
1-Propanol	71-23-8	500,000	3,700	3,100	5,300	3,300	13,000	14,000	15,000	17,000	ND	ND
n-Pentane	109-66-0	350,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7
Methyl acetate	79-20-9		ND	ND	ND	ND	ND	ND	ND	ND	ND	6.4
2-Pentanone	107-87-9	530,000	850	ND	1,400	770	4,900	4,100	5,800	7,300	ND	ND
2-Methylfuran	534-22-5		ND	ND	ND	ND	ND	ND	ND	ND	ND	5.3
1-Butanol	71-36-3	150,000	13,000	11,000	18,000	12,000	44,000	42,000	56,000	62,000	ND	4.3
2-Butanol	78-92-2	305,000	3,200	3,000	5,100	3,100	13,000	14,000	16,000	19,000	ND	ND
Cyclohexanone	108-93-0	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1
Methyl propionate	554-12-1		1,000	1,000	2,200	1,100	8,000	6,800	ND	13,000	ND	ND
Methyl butyrate	623-42-7		1,600	1,600	3,500	1,800	11,000	9,500	17,000	22,000	ND	ND
Cyclopentanone	120-92-3		ND	ND	ND	ND	ND	2,600	ND	ND	ND	ND
Isobutanol	78-83-1		ND	ND	1,300	ND	3,800	ND	4,600	ND	ND	ND
2MCP	1120-72-5		2,200	2,000	3,100	1,900	9,200	8,000	11,000	13,000	ND	ND
1-Hexanol	111-27-3		930	840	1,500	890	3,200	3,100	4,700	ND	ND	ND
2ECP	4971-18-0		2,700	2,400	3,700	2,300	9,400	7,600	13,000	15,000	ND	ND
23D2C1-one	1121-05-7		1,000	850	ND	910	ND	ND	ND	ND	ND	ND
2M2CP-1-one			ND	ND	ND	760	ND	ND	ND	ND	ND	ND
2E1H	104-76-7		11,000	10,000	18,000	12,000	32,000	29,000	51,000	56,000	ND	ND
Butyl hexanoate	626-82-4		1,100	1,100	ND	ND	ND	ND	ND	ND	ND	ND
Methyl hexanoate	106-70-7		ND	ND	ND	ND	ND	ND	4,400	5,700	ND	ND
Butyl butyrate	109-21-7		ND	ND	ND	ND	ND	ND	5,100	6,300	ND	ND
2EHB			1,200	1,500	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	99-87-6		ND	ND	ND	ND	ND	ND	ND	6,700	ND	ND

DCDFM Dichlorodifluoromethane (CFC 12)
 TCFM Trichlorofluoromethane
 4M2P 4-Methyl-2-pentanone

124TMB 1,2,4-Trimethylbenzene
 14DCB 1,4-Dichlorobenzene
 2MCP 2-Methylcyclopentanone

2ECP 2-Ethylcyclopentanone
 23D2C1-one 2,3-Dimethyl-2-cyclopenten-1-one
 2M2CP-1-one 2-Methyl-2-cyclopentanone-1-one

2E1H 2-Ethyl-1-hexanol
 2EHB 2-Ethylhexylbutyrate

Respirator Training Videos

1. Voluntary Use of Respirators (5:38) - <https://youtu.be/5i5xSrt3Mv8>
2. Respirator Types (16:10) - <https://youtu.be/wf64hl7WYJ8>
3. Maintenance & Care of Respirators (10:14) - <https://youtu.be/6rVpsnJv1Q0>
4. Respirators in the Workplace : Air Purifying Respirators (5:32) - <https://youtu.be/efNwHKAsHv8>
5. 3M™ Half Facepiece Respirator 6000 Series (15:10) - <https://youtu.be/yBg2B2BP9nA>
6. 3M™ 60926 Multi-Gas Resp. Cartridge w/ P100 Filter (3:32) - https://youtu.be/ms5h_yqid7g
7. 3M™ 2097 P100 Respiratory Filter w/ Nuisance OV (3:18) - <https://youtu.be/7FvCSgPqbjE>
8. Medical Evaluations for Workers Who Use Respirators (9:39) - <https://youtu.be/F4ksbeTPW9o>

Respirator Training Exam

1. The primary function of a respirator is to protect workers against respiratory hazards that may come in the form of chemical, biological, and radiological agents
 - A) True
 - B) False

2. Engineering controls are sufficient to protect workers against respiratory hazards in the workplace
 - A) True
 - B) False

3. Engineering controls and respirators are the primary methods for protecting workers from respiratory hazards
 - A) True
 - B) False

4. Respirators DO NOT protect workers against
 - A) Fog, mist, and smoke
 - B) Oxygen deficient atmospheres
 - C) Falls
 - D) Harmful dusts
 - E) Sprays, vapors, and gases

5. The two major classes of respirators are
 - A) Air purifying and atmosphere purifying
 - B) Atmosphere supplying and air decontaminating
 - C) Air purifying and air decontaminating
 - D) Atmosphere supplying and air purifying

6. Which of the following may compromise the effectiveness of the respirator's seal?
 - A) Beards
 - B) Mustaches
 - C) Sideburns
 - D) Oral surgery
 - E) All of the above

7. Employees who wear eye glasses or contact lenses are not permitted to use a respirator.
 - A) True
 - B) False

8. It is the employer's responsibility to ensure that their employees are medically fit enough to use a respirator.
 - A) True
 - B) False

9. A user seal check should be performed
 - A) Every time the respirator is worn
 - B) Weekly
 - C) Monthly
 - D) Daily

10. What does the phrase "Assigned Protection Factor" refer to?
 - A) The level of protection that a respirator or a class of respirator is expected to offer
 - B) The level of protection that engineering controls/work practices offer against respiratory hazards
 - C) The point at which a respirator stops offering any protection to the wearer
 - D) The employee to whom a respirator is assigned

11. Which of the following air purifying respirators has an Assigned Protection Factor of 50?
 - A) Half Mask/Dust Mask
 - B) Full Facepiece
 - C) A loose-fitting Powered Air-Purifying Air Respirator
 - D) A hood-powered PAPR

12. Which of these symptoms suggests that your respirator may be ineffective?
 - A) Shortness of breath
 - B) Dizziness
 - C) Coughing
 - D) All of the above

13. What does the acronym ESLI stand for?
 - A) Equilibrium Stability Level Indicator
 - B) End-of-Service Life Indicator
 - C) Energy Science Laboratories Incorporated
 - D) Eat Slowly Live Infinitely

14. What does the acronym IDLH stand for?
- A) Instant Death Lurks Here
 - B) Immediate Detection of Low Hazards
 - C) Integrated and Differentiated Level of Hazards
 - D) Immediately Dangerous to Life and Health
15. An employer is permitted to follow respirator cleaning recommendations provided by the manufacturer of the respirator and not necessarily the ones provided by OSHA, if (s)he wishes to do so.
- A) True
 - B) False
 - C) Only if the manufacturer's recommended procedure is as rigorous and effective as OSHA's.
16. Respirators should be inspected for wear and tear
- A) Daily
 - B) Weekly
 - C) Monthly
 - D) Before and after each use
17. Quantitative fit testing involves introducing gas, vapor, or aerosol into an area surrounding the head of the respirator user
- A) True
 - B) False
18. Even after having the fit testing done previously, respirator users need to redo their fit testing when they have
- A) Undergone a cosmetic surgery
 - B) Lost or gained weight
 - C) Put on makeup
 - D) Both A and B

19. This image asks the reader to do something, what is it?



- A) Wear your respirator
 - B) Wear a mask only if you're bald and have no facial hair
 - C) Eye protection is not necessary when using your respirator
 - D) Only half-mask respirators are required in this area
20. Which of the following is incorrect regarding half-mask respirators?
- A) They are designed to cover nose, mouth, and chin
 - B) They include replaceable cartridges
 - C) They provide protection in case of oxygen deficiency
 - D) They basically provide protection from dust, mists, and vapors

Appendix 2



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

August 8, 2019

Jonathan E Wilkinson
7321 Providence Drive
Edwardsville, IL 62025

RE: Missouri Asbestos Occupation Certification Card

Enclosed is your certification card for Asbestos Inspector, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118050319MOIR18490
Course Training Date: May 03, 2019
Missouri Certification Approval Date: August 09, 2019
Missouri Certification Expiration Date: May 03, 2020

Note:

- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
 - Sections 643.225 to 643.225, RSMo;
 - 10 CSR 10-6.241 *Asbestos Projects-Registration, Abatement, Notification, Inspection, Demolition, and Performance Requirements*; and
 - 10 CSR 10-6.250 *Asbestos Projects-Certification, Accreditation and Business Exemption Requirements*.
- To keep your occupation certification up-to-date, you must complete an annual refresher course and submit a renewal application each year.
- In order to be eligible to renew your certification, you must successfully complete a refresher course with a Missouri-accredited training provider within 12 months of the expiration date of your current training certificate. If you exceed this grace period, you will be required to retake a Missouri-accredited initial course in order to be eligible for Missouri certification.

To obtain a copy of the certification renewal application, or review regulations and requirements, please visit our website at <http://dnr.mo.gov/env/apcp/asbestos/index.htm>.

If you have any questions please call the Air Pollution Control Program at 573-751-4817.

AIR POLLUTION CONTROL PROGRAM

Director of Air Pollution Control Program



Recycled paper

CERTIFICATION NUMBER:

7118060719MOIR17479

THIS CERTIFIES

William J. Abernathy

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Inspector



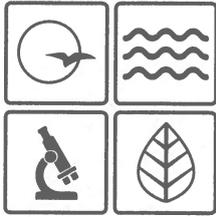
APPROVED: **06/17/2019**

TRAINING DATE: **06/07/2019**

EXPIRES: **06/17/2020**

A handwritten signature in blue ink, appearing to read "A. J. ...".

Director of Air Pollution Control Program



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

November 6, 2019

Arron A Weber
406 E Walnut
Chatham, IL 62629

RE: Missouri Asbestos Occupation Certification Card

Enclosed is your certification card for Asbestos Inspector, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118101819MOIR18135
Course Training Date: October 18, 2019
Missouri Certification Approval Date: November 07, 2019
Missouri Certification Expiration Date: November 07, 2020

Note:

- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
 - Sections 643.225 to 643.225, RSMo;
 - 10 CSR 10-6.241 *Asbestos Projects-Registration, Abatement, Notification, Inspection, Demolition, and Performance Requirements*; and
 - 10 CSR 10-6.250 *Asbestos Projects-Certification, Accreditation and Business Exemption Requirements*.
- To keep your occupation certification up-to-date, you must complete an annual refresher course and submit a renewal application each year.
- In order to be eligible to renew your certification, you must successfully complete a refresher course with a Missouri-accredited training provider within 12 months of the expiration date of your current training certificate. If you exceed this grace period, you will be required to retake a Missouri-accredited initial course in order to be eligible for Missouri certification.

To obtain a copy of the certification renewal application, or review regulations and requirements, please visit our website at <http://dnr.mo.gov/env/apcp/asbestos/index.htm>.

If you have any questions please call the Air Pollution Control Program at 573-751-4817.

AIR POLLUTION CONTROL PROGRAM

Director of Air Pollution Control Program



Recycled paper



2539 Vandalia Street, Collinsville, IL 62234 * Phone: 618-855-8764

Environmental and Occupational Safety & Health Training

Does hereby certify

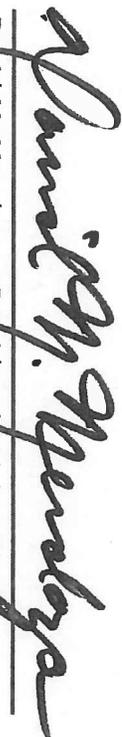
Bradley Vits

406 East Walnut, Chatham, IL 62629

*Has successfully completed and passed the course examination with at least
70% for re-accreditation under AHERA (Title II)*

Asbestos Building Inspector Refresher

Class Date: 09/06/2019
Examination Date: 09/06/2019
STC Certificate Number: STC-20190906-002573ABIR
Certification Expiration: 09/06/2020


David M. Mendoza – President/Training Director
Certified Environmental Specialist
OSHA Authorized Instructor

"Imagineering a Better World"

No 7614



Riedel Environmental Technologies Inc.

Certificate of Completion

presented to

William J. Abernathy

in recognition of satisfactory completion
of the course of instruction entitled

29 CFR 1910.120 Forty Hour Hazardous Materials Handling & Response

February 15 - 19, 1993

Date(s) of Instruction

A handwritten signature in dark ink, appearing to read "Debbie A. Lacombe", is written over a horizontal line.

Instructor

Certificate of Completion

This certifies that

William Abernathy

has successfully completed

8 Hour HAZWOPER Refresher Training

Refresher certification does NOT necessarily indicate initial 24 or 40 Hour HAZWOPER certification

In Accordance w/Federal OSHA Regulation 29 CFR 1910.120(e) & (p)

And all State OSHA/EPA Regulations as well including 29 CFR 1926.65 for Construction.

This course (Version 2) is approved for 8 Contact Hours (0.8 CEUs) of continuing education per the California Department of Public Health for Registered Environmental Health Specialist (REHS) (Accreditation # 044).

Jules Griggs

Instructor

1904305235837

Certificate Number

4/30/2019

Issue Date

Julius P. Griggs

Julius P. Griggs
Program Administrator



Rod Zierenberg

Training Director

ONLINE TRAINING
OTS
SYSTEMS

HazMat Student, LLC
2828 Cochran St., Suite 322 Simi Valley, CA 93065
<http://www.hazmatstudent.com>

Scan this code or visit www.otsystems.net/v to verify certificate.

Proof of initial certification and subsequent refresher training is NOT required to take refresher training

This course is distributed by HazMat Student, LLC (<http://www.hazmatstudent.com>)

Certificate of Completion

This document is to certify that

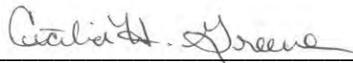
Bill Abernathy

*has participated in, and successfully completed
the training course entitled:*

TENORM Worker I

on the 21st day of February 2019.

Valid through February 21, 2021



Cecilia H. Greene, Instructor



Radiological Health, Safety and Environmental Services
A USA Environment, L.P. Company

This training satisfies the requirements
for NORM workers listed in LAC 33
XV.1499 Appendix B:

State of Missouri

**Department of Insurance, Financial Institutions and Professional Registration
Division of Professional Registration
Missouri Board of Geologist Registration
Registered Geologist**

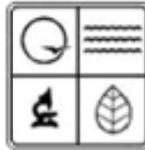


VALID THROUGH APRIL 30, 2021
ORIGINAL CERTIFICATE/LICENSE NO. 2016016274

WILLIAM J ABERNATHY
9909 MARKHALL LANE
SAINT LOUIS MO 63123
USA

Pamela Grosse
EXECUTIVE DIRECTOR

Kathleen Anne Denver
DIVISION DIRECTOR



MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
573-368-2165

CONTRACTOR PERMIT

Permit #: 003662 - M

Restriction(s):

Expires: 10/01/2020

M

Issued to: ABERNATHY, WILLIAM

Company: FEEZOR ENGINEERING, INC

Status:

MO 780-1075 (5-13)

Appendix 3

Feezor Engineering, Inc. West Lake Landfill OU-1 Design Investigation

Content Revision Date: 2/26/2020

Item #	Description / identity of relevant SH&E risk	Identity / citation of related legal compliance obligation	How does one gain access to the text of this legal compliance obligation?	Remarks
1	Radiation Safety Training	<ul style="list-style-type: none"> LAC 33.XV §1499 Appendices A & B 	<ul style="list-style-type: none"> deg.louisiana.gov/assets/docs/Legal_Affairs/ERC/Radiation052017.pdf 	4-hr classroom presentation provided by various companies. Renewed bi-annually.
2	General Safety Training	<ul style="list-style-type: none"> US OSHA 29 CFR 1926.21 	<ul style="list-style-type: none"> www.osha.gov 	1-hr classroom presentation provided by Bridgeton Landfill, LLC for all FEI employees working on-site. Renewed annually. Written materials available.
3	Portable Fire Extinguishers	<ul style="list-style-type: none"> US OSHA 29 CFR 1910.157 	<ul style="list-style-type: none"> www.osha.gov 	Self-paced web-based training provided by various companies. Renewed as needed for specific projects.
4	Respiratory Protection	<ul style="list-style-type: none"> US OSHA 29 CFR 1910.134 	<ul style="list-style-type: none"> www.osha.gov 	Self-paced written training module provided by FEI for employees. Voluntary program, renewed annually or as needed for individual employees for West Lake Landfill projects.
5	Hazard Communication	<ul style="list-style-type: none"> US OSHA 29 CFR 1910.1200 	<ul style="list-style-type: none"> www.osha.gov 	Self-paced web-based training provided by various companies. Renewed as needed.
6	Hazardous Waste Operations and Emergency Response	<ul style="list-style-type: none"> US OSHA 29 CFR 1910.120 	<ul style="list-style-type: none"> www.osha.gov 	40-hr initial classroom training + 8-hr annual web-based renewal provided by various companies.
7	Nuclear Gauge Safety Training	<ul style="list-style-type: none"> 32 IL 330.220(b) US DOT 49 CFR 172.704 	<ul style="list-style-type: none"> www.iema.illinois.gov www.transportation.gov 	Web-based training, provided by various companies approved by IEMA, for operation of FEI's nuclear density gauge (a Licensed Radioactive Device). Renewed annually.
8	Asbestos Awareness/Building Inspection	<ul style="list-style-type: none"> 10 CSR 10-6.241 & 10-6.250 	<ul style="list-style-type: none"> www.dnr.mo.gov/env/apcp 	24-hr initial classroom training + 4-hr annual classroom renewal provided by various companies approved by MDNR. Written materials available.

Appendix 4

Feezor Engineering, Inc.
West Lake Landfill OU-1 Design Investigation
Risk Register

Activity	Hazard Identification	At Risk	Pre-Risk Mgt Evaluation Matrix			Pre-Risk Mgt Treatment	Risk Mgt & Control - Safety & Health			Risk Mgt & Control - Environmental			Responsible Person	Cost Contingency	Post-Risk Mgt Evaluation Matrix			Residual Risk Action
			Probability	Severity	Initial Risk		Eng/Admin Controls	PPE	Waste Mgt	Eng/Admin Controls	Site Condition Controls	Probability			Severity	Post-Risk		
Oversight during Borehole Locations Survey	Uneven footing (slips/trips/falls), radiological exposures, biological hazards, scratches/cuts, skin punctures	Area entrants	Seldom	Marginal	LOW	Accept	RWP, HASP, RSP, dosimetry, radiation safety training	Level D, hi-vis outerwear, protective clothing, boot covers	NA	OSHA requirements, training/education	Fire extinguishers & 1st aid in work vehicles, decon materials at main entry/exits	Site Health & Safety Supervisor	per Approved Budget	Seldom	Negligible	LOW	NA	
Oversight during Overland Gamma Surveys	Uneven footing (slips/trips/falls), radiological exposures, biological hazards, scratches/cuts, skin punctures	Area entrants	Occasional	Marginal	MODERATE	Reduce	RWP, HASP, RSP, dosimetry, radiation safety training	Level D, hi-vis outerwear, protective clothing, boot covers	NA	OSHA requirements, training/education	Fire extinguishers & 1st aid in work vehicles, decon materials at main entry/exits	Site Health & Safety Supervisor	per Approved Budget	Occasional	Negligible	LOW	NA	
Oversight during Access Construction	Noise, overhead debris, limited visibility, uneven footing (slips/trips/falls), heavy equipment contact injuries, radiological exposures, biological hazards, dust, scratches/cuts, skin punctures, equipment rollover	Area entrants	Occasional	Critical	HIGH	Reduce	JSA, RWP, HASP, RSP, dust suppression, dosimetry, radiation safety training	Level D, hearing protection, hi-vis outerwear, protective clothing, boot covers	Minimize, collect & stage as necessary	OSHA requirements, training/education, task checklist, instrument manuals, scope-of-work, material specifications	Fire extinguishers & 1st aid in work vehicles and heavy equipment, decon materials at main entry/exits	Site Health & Safety Supervisor	per Approved Budget	Occasional	Marginal	MODERATE	NA	
Oversight / Field Support during Borehole Drilling Activities (Sampling, Gamma Logging, Abandonment, Equip Decon)	Noise, overhead equipment & materials, limited visibility, trip hazards, heavy equipment contact injuries, radiological exposures, biological hazards, dust, muscle strain	Area entrants	Occasional	Marginal	MODERATE	Reduce	JSA, RWP, HASP, RSP, dust suppression, dosimetry, radiation safety training	Level D, hearing protection, hi-vis outerwear, protective clothing, boot covers	Minimize, collect & stage as necessary	OSHA requirements, training/education, task checklist, instrument manuals, scope-of-work, material specifications, SOPs	Fire extinguishers & 1st aid in work vehicles and heavy equipment, decon materials at main entry/exits	Site Health & Safety Supervisor	per Approved Budget	Seldom	Marginal	LOW	NA	
Assistance during Core Logging, Scanning, Sampling, & Storage	Radiological exposures	Area entrants	Seldom	Marginal	LOW	Accept	RWP, HASP, RSP, dosimetry, radiation safety training	Level D, hi-vis outerwear, protective clothing, boot covers	Minimize, collect & stage as necessary	OSHA requirements, training/education, instrument manuals, scope-of-work, SOPs	Water spray bottles for wetting core surfaces, decon materials for tools & instruments	Site Health & Safety Supervisor	per Approved Budget	Seldom	Marginal	LOW	NA	

Severity Rankings

- Catastrophic** Conditions are such that human error, design or procedural deficiencies, or component failure may commonly cause death, thereby requiring immediate cessation of the activity.
- Critical** Conditions are such that human error, design or procedural deficiencies, or component failure may commonly cause severe injury or illness, thereby requiring immediate corrective action.
- Marginal** Conditions may commonly cause minor injury or illness such that human error, design or procedural deficiencies, or component failure can be counteracted or controlled without severe injury or illness.
- Negligible** Conditions are such that human error, design or procedural deficiencies, or component failure will result in no, or less than minor, illness or injury.

Probability Rankings

- Frequent** Likely to occur often during the life of the activity
- Likely** Will occur several times during the life of the activity
- Occasional** Likely to occur some time during the life of the activity
- Seldom** Unlikely but possible to occur during the life of the activity
- Unlikely** So unlikely that it can be assumed an occurrence may not be experienced during the life of the activity

		PROBABILITY				
SEVERITY	Ca	E	E	H	H	M
	Cr	E	H	H	M	L
	M	H	M	M	L	L
	N	M	L	L	L	L
		F	L	O	S	U

Appendix 5

Feezor Engineering, Inc.
Employee Training Tracker

Employee	Most Recent Hazwoper Refresher	Next Refresher Due:	Most Recent TENORM training	TENORM Refresher Due:	Most Recent MO Asbestos Inspector	MO Asbestos Inspector Refresher Due:
Dan Feezor	06/17/19	06/16/20	02/21/19	02/20/21		
Brad Vits	01/09/20	01/08/21	02/21/19	02/20/21	09/06/19	09/04/20
Andrew Roberts	01/02/20	01/01/21	02/21/19	02/20/21		
Aaron Karlas	03/08/19	03/07/20				
Arron Weber	01/09/20	01/08/21	02/21/19	02/20/21	11/07/19	11/05/20
Michael Spurgeon	03/29/19	03/28/20	02/21/19	02/20/21		
Dane Hale	05/09/19	05/08/20	02/21/19	02/20/21		
Jonathan Wilkinson	04/12/19	04/11/20	02/21/19	02/20/21	08/03/19	08/01/20
Bill Abernathy	04/30/19	04/29/20	02/21/19	02/20/21	06/17/19	06/15/20
Andrew Wyatt	01/21/20	01/20/21	02/21/19	02/20/21		
Janet Feezor	04/24/19	04/23/20				

Appendix G – SSHEP Ameripysics

Information Required in an SSHEP

Section	Title	Section	Title
1	Project Owner, Project Name, and Contractor’s Safety, Health, and Environmental Policy Statement	11	Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions
2	Scope of Work Evaluation	12	Employee Participation and Consultation
3	Responsibility and Identification of Key Personnel	13	Emergency Action Plan
4	Overall Assessment of SH&E Hazards, Exposures, and Risks	14	Site-specific Medical Emergency Plan
5	Relevant SH&E Compliance Programs, Associated Compliance Information, and Personnel Responsibility Assignments	15	Incident Reporting, Investigation, and Corrective Action Processes
6	SH&E Compliance Training Matrix and Training / Education Processes	16	Work Site Inspection and Program Audit Processes
7	Site-specific Worker Orientation Program	17	Progressive Disciplinary Program
8	Identification of Competent / Qualified Personnel	18	Recordkeeping / Document Retention Processes
9	Hazard Identification, Notification, and Correction Process	19	Other (as defined by Contractor or Parsons)
10	Specific Hazard and Risk Control Measures (e.g., Activity Hazard Analyses, Operational Risk Management Processes)	20	Other (as defined by Contractor or Parsons)

Date: 7/10/2020

Project/Location:

Contractor Name: Ameriphysics, LLC

Parsons SH&E Representative: Darrell Pruitt

The information provided here is based on a review of the contractor site-specific safety, health, and environmental plan (SSHEP). Areas identified as incomplete shall be revised based on the standards in the contract specifications and the project safety, health, and environmental plan (PSHEP). Contractors shall resubmit revised sections of the SSHEP to the project manager within 1 week of receiving this review documentation.

Section	Complete	Incomplete	Section	Complete	Incomplete
Statement of SH&E Policy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Specific Activity Hazard Analyses (AHAs) and Operational Risk Assessments	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Scope of Work Evaluation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Adequate Hazard / Risk Controls	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Key Line Personnel Identified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2-Week Look-ahead Planning	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Overall Assessment of Hazards and Risks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Employee Participation and Consultation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Relevant SH&E Compliance Programs (Hazard Communication, PPE, HAZWOPER, Hazardous Energy Control, Fall Protection, Confined Space Entry, RCRA, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Emergency Action Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SH&E Compliance Program Responsibilities Assigned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Site-specific Medical Emergency Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Compliance Training and Education Programs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Incident Reporting, Investigation, and Corrective Action Processes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Site-specific Worker Orientation Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Work Site Inspection and Program Audit Processes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Competent and Qualified Personnel Identified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Progressive Disciplinary Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hazard Identification, Notification, and Correction Process	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Recordkeeping / Document Retention Processes	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments / Other SSHEP Sections or Information Required

Reviewed by:

Name

Title

Ameriphysics, LLC

West Lake Landfill OU-1 Design Investigation

Contractor Site-specific Safety, Health, and
Environmental Plan (SSHEP)

7/10/20

Table of Contents

Contractor’s Safety, Health, and Environmental Policy Statement 5

Scope of Work Evaluation 6

Responsibilities and Identification of Key Personnel 7

Overall Assessment of SH&E Hazards, Exposures, and Risks 8

SH&E Compliance Programs 9

SH&E Compliance Training Matrix and Training / Education Processes..... 10

Site-specific Worker Orientation Program 11

Identification of Competent / Qualified Persons 12

Hazard Identification, Notification, and Correction Process 13

Specific Hazard and Risk Control Measures 14

Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions..... 15

Employee Participation and Consultation 16

Emergency Action Plan 17

Site-specific Medical Emergency Plan 17

Incident Reporting, Investigation, and Corrective Action Processes 18

Work Site Inspection and Program Audit Process..... 19

Progressive Disciplinary Program..... 20

Recordkeeping / Document Retention Processes 21

Attachments 22

Contractor's Safety, Health, and Environmental Policy Statement

This plan contains the minimum requirements for an effective contractor site-specific safety, health, and environmental Plan (SSHEP) by Ameripysics, LLC (Ameripysics) for the West Lake Landfill OU-1 Design Investigation. This SSHEP shall be implemented and maintained by Ameripysics. This SSHEP applies to all persons of our company.

The leadership team is responsible for ensuring that all SH&E policies and procedures are clearly communicated and understood by all employees. Managers and supervisors are expected to enforce the rules fairly and uniformly.

All employees are responsible for using safe work practices, following all directives, policies and procedures, and assisting in maintaining a safe work environment.

Our system of ensuring that all workers comply with the rules and maintain a safe work environment includes the following.

- Informing workers of the provisions of this SSHEP
- Evaluating the SH&E performance of all workers
- Recognizing employees who consistently perform SH&E work practices very well
- Providing training to workers whose SH&E performance is deficient
- Disciplining workers for failure to comply with safe, healthful, and environmentally responsible work practices

Scope of Work Evaluation

Work to be performed by Ameriphsysics during the West Lake Landfill OU-1 Design Investigation will include providing radiological oversight and support during the following tasks:

Task 1 – Provide assistance and associated field support for the survey contractor during staking of the proposed borehole locations within OU-1 Areas 1 & 2

Task 2 – Provide assistance and associated field support for the radiological services contractor during performance of overland gamma surveys at the proposed borehole locations within OU-1 Areas 1 & 2

Task 3 – Provide assistance and associated field support for the construction services contractor during construction of borehole access routes and drilling pads at locations within OU-1 Areas 1 & 2, within Bridgeton Landfill's North Quarry, and at any other Design Investigation (DI) drilling locations, as warranted

Task 4 – Oversee drilling/sampling activities and provide associated field support for the drilling contractor as needed

Task 5 – Record pertinent information obtained during drilling/sampling activities in a log book, including blow counts, weather conditions, dates/times of notable events or developments, notes on any problems encountered, etc.

Task 6 – Provide assistance and associated field support for the radiological services contractor during core sample collection/storage, preliminary core scanning activities, and downhole gamma logging activities

Task 7 – Provide assistance and associated field support for the drilling contractor during borehole abandonment activities

Task 8 – Provide assistance and associated field support for the radiological services contractor during decontamination activities as needed

Task 9 – Visually inspect and geologically log core samples, photo-document core samples, and collect laboratory samples from the cored material

Task 10 – Provide assistance to the radiological services contractor during performance of detailed radiological core scanning activities

Task 11 – Coordinate core handling/storage activities and the packaging/shipment of laboratory samples, including the completion of chains-of-custody and assisting the radiological services contractor in preparing radioactive shipments, if any

Responsibilities and Identification of Key Personnel

These personnel have authority and responsibility to implement this program.

Contractor:	Ameriphysics, LLC	
Address:	9111 Cross Park Drive, Knoxville, TN 37923	
Telephone	Fax	Email
800-563-7497	865-470-4179	info@ameriphysics.com
Company Executive responsible for project		Contact No.
Thomas W. Hansen, Jr.		Direct Line: (865)470-4175 Cell Phone: (865)228-1997 Email: tom@ameriphysics.com
Manager/Superintendent:		Contact No.
Thomas W. Hansen, Jr.		Direct Line: (865)470-4175 Cell Phone: (865)228-1997 Email: tom@ameriphysics.com
Safety Representative/Manager:		Contact No.
Paul Jones		Direct Line: (865)470-4097 Cell Phone: (865)591-8632 Email: pjones@ameriphysics.com
Key Foreperson or Forepersons:		Contact No.
Thomas W. Hansen, Jr.		Direct Line: (865)470-4175 Cell Phone: (865)228-1997 Email: tom@ameriphysics.com
Client Project Management Point of Contact:		Contact No.
Thomas W. Hansen, Jr.		Direct Line: (865)470-4175 Cell Phone: (865)228-1997 Email: tom@ameriphysics.com

All managers and supervisors are responsible for implementing and maintaining the SSHEP in their work areas and for answering worker questions about the SSHEP. Managers and supervisors shall make a copy of this SSHEP available to all workers.

Overall Assessment of SH&E Hazards, Exposures, and Risks

Task	Potential Hazards	Mitigation/Response Actions
Location survey assistance	<ul style="list-style-type: none"> - Traversing uneven terrain - Radiological exposure inside Areas 1/2 - Vehicular traffic at locations near roads 	<ul style="list-style-type: none"> - Be alert to surroundings - Follow RWP and/or site PPE requirements - Hi-vis outerwear, traffic control equipment
Overland survey assistance	<ul style="list-style-type: none"> - Traversing uneven terrain - Radiological exposure 	<ul style="list-style-type: none"> - Be alert to surroundings - Follow RWP PPE requirements
Construction assistance	<ul style="list-style-type: none"> - Noise - Heavy equipment - Muscle strain - Radiological exposure inside Areas 1/2 	<ul style="list-style-type: none"> - Use hearing protection - Stay >15 ft from equipment and be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Follow RWP and/or site PPE requirements, utilize dust suppression
Drilling oversight	<ul style="list-style-type: none"> - Noise - Heavy equipment - Muscle strain - Rotating equipment/pinch points - Falling objects - Radiological exposure from excavated materials, open boreholes 	<ul style="list-style-type: none"> - Use hearing protection - Stay >15 ft from equipment and be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Watch moving parts, overhead activity - Follow RWP and/or site PPE requirements, utilize dust suppression
Field notes/documentation	<ul style="list-style-type: none"> - Inattentiveness/distraction - Radiological exposure inside Areas 1/2 	<ul style="list-style-type: none"> - Stay alert to surroundings at all times - Follow RWP and/or site PPE requirements
Rad services assistance	<ul style="list-style-type: none"> - Muscle strain - Radiological exposure from excavated materials, open boreholes 	<ul style="list-style-type: none"> - Use safe lifting technique/ergonomics - Follow RWP and/or site PPE requirements
Borehole abandonment	<ul style="list-style-type: none"> - Noise - Heavy equipment - Rotating equipment/pinch points - Falling objects - Radiological exposure inside Areas 1/2 	<ul style="list-style-type: none"> - Use hearing protection - Stay >15 ft from equipment and be alert to operators' limited visibility - Watch moving parts, overhead activity - Follow RWP and/or site PPE requirements
Decontamination support	<ul style="list-style-type: none"> - Splashing liquids - Muscle strain - Slips, trips, falls 	<ul style="list-style-type: none"> - Splash shields, spray control/avoidance - Use safe lifting technique/ergonomics - Watch footing, use slip-resistant equipment
Core logging/sampling	<ul style="list-style-type: none"> - Muscle strain - Radiological exposure from cores 	<ul style="list-style-type: none"> - Use safe lifting technique/ergonomics - Follow RWP PPE requirements - Dampen cores to shield alpha decay
Core scanning assistance	<ul style="list-style-type: none"> - Radiological exposure from cores 	<ul style="list-style-type: none"> - Follow RWP PPE requirements
Core/sample management	<ul style="list-style-type: none"> - Muscle strain - Rad exposure from cores/samples 	<ul style="list-style-type: none"> - Use safe lifting technique/ergonomics - Follow RWP PPE requirements

Activities shall be evaluated and activity hazards analyses (AHAs) or other effective risk management process shall be developed. AHAs and other risk management processes are described and included in this SSHEP and the associated PSHEP.

SH&E Compliance Programs

Ameriphysics shall comply with relevant SH&E laws and regulations. Written compliance programs shall be implemented on our job sites and coordinated with other site contractors, our lower-tier subcontractors, and with Parsons, as appropriate. Our employees shall be aware of these programs, receive adequate training, and perform their work consistent with these compliance programs.

The following Health and Safety programs can be found in Ameriphysics Health and Safety Manual are maintained by their Health and Safety Manager:

- Hazard Evaluation/Control Program
- Hazard Communication Program
- PPE Hazard Assessment
- Confined Space Entry Program
- Respiratory Protection Program
- Hearing Conservation Program
- Lockout/Tagout Program
- Emergency Response Plan
- Chemical Hygiene Plan
- Exposure Control Plan
- Process Safety Management Program
- Emergency Action Plan
- Fire Prevention Plan
- Hazardous/Toxic Substance Control Program

Ameriphysics also abides by a Radiation Control program that is maintained by its Radiation Safety Officer.

SH&E Compliance Training Matrix and Training / Education Processes

All workers, including managers and supervisors, shall receive competent and relevant site-specific SH&E training. This training shall include site-specific SH&E compliance training and general site training on SH&E best practices. Our employees shall be properly prepared for conducting their work and shall comply with the relevant SH&E programs and general site-specific SH&E practices.

A written training matrix shall be established and maintained that identifies the workers (by name or by title/role), all of the SH&E-related training they must have, and the frequency for refresher (if needed).

Training shall be provided:

- When the SSHEP is established;
- To all new workers;
- To all workers with new job assignments for which training has not been previously provided;
- When new substances, processes, procedures, or equipment are introduced to the workplace and represent a new hazard, potential exposure, or risk;
- When the employer is made aware of a new or previously unrecognized hazard, exposure, or risk;
- To familiarize supervisors with the SH&E hazards, exposures, or risk to which workers under their immediate direction and control may be exposed; and
- To all workers for hazards, exposures, or risks specific to their job assignment and in compliance with related SH&E compliance programs.

Workplace safety and health practices for all work locations shall include, at a minimum:

- An explanation of the SSHEP, the Parsons Project Safety, Health, and Environmental Plan (PSHEP), the site’s emergency action plan and fire prevention plan, and the measures to report unsafe conditions, work practices, injuries, and/or a recognized need for additional instruction;
- The general purpose, availability, use, limitations, and disposal of outerwear and personal protective equipment;
- Locations of sanitation, hand-washing, and drinking water facilities;
- Provisions for medical services and first aid, including emergency procedures;
- Response procedures for environmental spills or releases; and
- Specific instructions to workers on hazards unique to their job assignment to the extent such information is not covered in other training.

License/Certification	Employee
OSHA HAZWOPER 40-hr + 8-Hr Refresher	All onsite personnel
Radiation Safety Training	All onsite personnel
Bridgeton LF Annual H&S	All onsite personnel

Site-specific Worker Orientation Program

All new workers on our jobsite shall receive site-specific orientation training before conducting their work. This training shall consist of SH&E compliance training and general site SH&E practices related to their work.

Employees completing orientation shall acknowledge in writing completing and understanding the site-specific orientation subject matter. Employees who do not understand one or more subjects shall be retrained.

Site orientation training is provided by Matt Stewart - Environmental Manager, Bridgeton Landfill.

Identification of Competent / Qualified Persons

Contractor Competent Person Certification (United States)

Definition					
A competent person is a formally-designated person having the ability to recognize existing and predictable hazards and has the authority to correct them.					
Responsibility					
The designated contractor competent person is responsible for recognizing and correcting SH&E risks/hazards. This person has the authority to stop work due to a perceived SH&E concern on the jobsite. This contractor manager and designated competent person are considered field contacts for Parsons projects.					
This form shall be completed by each contractor manager and the contractor-designated competent person. Where a contractor is responsible for multiple crafts, it will be necessary to maintain additional designated competent persons and forms. Each contractor on a Parsons project shall submit this completed form to the Parsons project manager before beginning work on the project and must update it any time the designated competent person changes.					
Acknowledgment					
I, <u>Thomas W. Hansen, Jr.</u> representing, <u>Ameriphysics, LLC</u>					
Contractor Manager (Printed)		Contractor Company Name (Printed)			
have assigned <u>Thomas W. Hansen, Jr.</u> to be the competent person in the areas indicated and					
Contractor Competent Person (Printed)					
I acknowledge that this individual has been thoroughly trained, is experienced in hazard recognition, and has the authority to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.					
_____		_____			
Contractor Manager (Signature)		Date			
I acknowledge that I have been thoroughly trained and have the experience to perform the duties as the competent person in the areas marked below, and I understand that I have the responsibility and authority to correct hazards and to stop work in the event of a potential hazardous or imminent danger situation.					
_____		_____			
Contractor Competent Person (Signature)		Date			
(Check the areas in which the designated competent person is permitted to execute the role of Contractor Competent Person.)					
<input checked="" type="checkbox"/>	Air Pollution and Emissions	<input checked="" type="checkbox"/>	Environmental Assessments	<input type="checkbox"/>	Mechanical Demolition
<input type="checkbox"/>	Asbestos	<input type="checkbox"/>	Excavations and Trenches	<input type="checkbox"/>	Protected Ecological and Cultural Resources
<input type="checkbox"/>	Bolting, Riveting, and Fitting	<input type="checkbox"/>	Fall Protection	<input type="checkbox"/>	Resource Conservation
<input type="checkbox"/>	Buried Items	<input type="checkbox"/>	First Aid and CPR	<input checked="" type="checkbox"/>	Respiratory Protection
<input type="checkbox"/>	Concrete, Forms, and Shoring	<input type="checkbox"/>	Hearing Protection	<input type="checkbox"/>	Rigging
<input type="checkbox"/>	Cranes and Derricks	<input type="checkbox"/>	Ladders	<input type="checkbox"/>	Scaffolding
<input type="checkbox"/>	Demolition	<input type="checkbox"/>	Lead	<input type="checkbox"/>	Tunnels and Shafts
<input type="checkbox"/>	Drinking Water	<input checked="" type="checkbox"/>	Management of Hazardous Materials and Hazardous Solid Wastes	<input type="checkbox"/>	Underground Construction
<input type="checkbox"/>	Electrical			<input type="checkbox"/>	Wastewater
<input checked="" type="checkbox"/>	Emergency Response to Spills and Releases	<input type="checkbox"/>	Marine Work and Diving	<input type="checkbox"/>	Welding and Cutting
<input type="checkbox"/>		<input type="checkbox"/>	Material and Personnel Hoists		
<input checked="" type="checkbox"/>	Other – Radiation Protection				

Hazard Identification, Notification, and Correction Process

Each employee is the critical leader for preventing injuries, illnesses, and adverse environmental impacts, Achieving SH&E excellence requires a personal commitment. Therefore, each employee is authorized to stop work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the work stoppage to the other affected stakeholders and further evaluate the condition and adjust the work plan to resolve the safety, health, or environmental concern before restarting the work.

Each employee shall understand that he or she has the **authority** and the **responsibility** to stop work at any time when he or she notices an unplanned or unexpected issue that he or she believes will adversely affect the project's safety, health, or environmental risk. This concept is consistent with Parsons' SH&E core value.

There is no circumstance where retribution may be directed toward an employee who conscientiously exercised his or her stop work authority.

When should work be stopped? Here are some examples.

- An unsafe act is observed.
- An unsafe condition is observed in the work area.
- An incident or near miss occurs in the work area.
- There is an emergency.
- Alarms sound.
- There is a change in the planned work conditions.
- There is a change in the planned personnel associated with the work.
- There is a change in the planned in scope of work.
- A change is needed in the work plan.
- One or more personnel associated with the work task appear to be confused or demonstrate that they do not understand one or more parts of the work plan.
- Someone believes that personnel, the environment, facilities, or equipment, is exposed to an unacceptable level of risk.

Unsafe, unhealthful, or environmentally damaging work conditions, practices, or procedures shall be corrected in a timely manner based on the severity of the risk posed.

Specific Hazard and Risk Control Measures

Activities shall be evaluated by workers and other subject matter experts to determine the appropriate hazard and risk controls that shall be implemented when performing the activity. In most cases, formal activity hazard analyses (AHAs) shall be communicated and used; however, some activities may require more sophisticated risk management schemes.

See **Appendix C of the main PSHEP** for Job Safety Analyses/Activity Hazard Analyses previously developed for OU-1 site activities by Feezor Engineering, Inc., in addition to those developed for site work by Parsons Corporation. Ameripysics will be providing radiological oversight for these activities, so the same hazards will be applicable.

Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions

The risk mitigation 2-week look ahead form, below, will be used to plan integrated risk mitigation strategies at weekly progress meetings.

SH&E Risk Mitigation 2-week Look-ahead Form			
SH&E Plan for Week Ending:		Contractor:	
Project/ Location:		Meeting Date:	
Plan Prepared by:		Dated:	
Next Two Weeks' Scope of Work: _____			
Identified SH&E Risks/Exposures/Hazards Issues: _____			
Identify Tasks requiring environmental construction permitting (e.g., stormwater permit) or involving other environmental regulatory issues (e.g., generation of new, uncharacterized waste): _____			
Tasks with environmental risk of significant spills or releases: _____			
Control Measures: _____			
Additional Activity Hazards Analysis Required: _____			
Contractors and Subcontractors Mobilizing/Demobilizing: _____			
Audits/Inspections Scheduled: _____			
Competent Person Changes: _____			
Planned Orientation/Training: _____			
Recommendations/Comments/Concerns: _____			
Note: This information shall be incorporated into the meeting minutes.			

Employee Participation and Consultation

Open, two-way communication between the leadership team and line employees on SH&E issues is essential to an injury-free, productive, and environmentally sound workplace. The following system provides for the flow of SH&E information.

- Continually maintaining an environment where any worker can report SH&E concerns without any risk of retribution.
- A collaborative approach to resolving worker SH&E concerns, using worker knowledge and experience in developing appropriate risk control measures.
- New worker orientation, including specific orientation to SH&E policies and procedures
- Reviews of the SSHEP and the Parsons PSHEP
- Workplace SH&E training programs
- Regular SH&E meetings
- Posted or distributed SH&E information (awareness program)
- Procedures to anonymously inform SH&E management of workplace hazards, exposures, or risks
- An employee (or labor/management) SH&E committee that: 1) meets regularly and prepares written records, 2) reviews results of periodic scheduled inspections, 3) reviews incident investigations, 4) assesses work risk, 5) reviews reports of hazards, exposures, or adverse environmental conditions, and 6) makes suggestions to management to prevent future incidents.

Emergency Action Plan

Emergency Action planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan and Site Management Plan, and in Bridgeton Landfill's Incident Management Plan, included in **Appendix H** of the HASP.

Any incident occurring on the site will be entered into IndustrySafe within four hours of occurrence, and the Parsons field team lead (FTL) and safety manager will be notified immediately.

Site-specific Medical Emergency Plan

Medical emergency planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan and Site Management Plan, and in Bridgeton Landfill's Incident Management Plan, included in **Appendix H** of the HASP.

Incident Reporting, Investigation, and Corrective Action Processes

Incident reporting, investigation, and corrective action strategies for the site are described in West Lake Landfill's Emergency Response Plan and Site Management Plan, and in Bridgeton Landfill's Incident Management Plan, included in **Appendix H** of the HASP.

Work Site Inspection and Program Audit Process

Site SH&E inspections shall be performed by one or more knowledgeable employees prior to beginning work each day in areas where work will take place during the shift. Designated competent persons shall perform frequent inspections and assessments of the areas and activities under their oversight throughout the day. Deficiencies shall be corrected as soon as possible.

The superintendent or project manager shall perform documented weekly SH&E inspections of all work sites. Deficiencies shall be tracked to closure in a timely manner.

The following SH&E inspections shall be performed. Findings shall be tracked to timely closure.

Competent Person / Inspector	Area of Responsibility	Frequency
Radiation Control Supervisor or Designee	Radiation Safety	Daily

The following compliance programs shall be reviewed and audited. Findings shall be tracked to timely closure.

Reviewer / Auditor	Compliance Program	Frequency
Tim Pratt	Radiation Control Program	Annually
Paul Jones	Health & Safety Program	Annually

Progressive Disciplinary Program

Ameriphysics' disciplinary program is described in Section 8 of its Employee Policy Manual. Violation of the company's Code of Conduct may result in one of the following corrective actions:

- Termination of Employment
- Suspension
- Oral Warning
- Written Warning

Progressive discipline may not be followed if an employee's actions warrant immediate separation. All disciplinary action records will be maintained in the employee's personnel file. All disciplinary procedures or actions are within the sole discretion of management.

The following may be considered in arriving at a decision for corrective action:

- The seriousness of the violation
- The employee's past record
- The circumstances surrounding the violation

A partial list of violations includes:

- Alcohol and Drugs
- Harassment
- Theft, Fraud, or Embezzlement
- Conflict of Interest
- Falsifying Company Documents or Records
- Fighting or Abusive Behavior
- Insubordination
- Unauthorized use of Company Property or Equipment
- Telephone Use
- Violation of Laws, Company Policies, and Procedures
- Absence without Notice and Punctuality
- Personal Appearance and Hygiene
- Access to Building/Office
- Access to Company Premises and Property
- Confidentiality

Recordkeeping / Document Retention Processes

All records shall be maintained no less than 3 years beyond the end of the contracted work, unless a longer period of retention is required by a regulatory agency.

Ameripysics SH&E document retention process will be done according to Ameripysics Quality Manual. Document control is expected to contain the following:

- Electronic retention of licensing, certification, and training records of Ameripysics field staff;
- Radiological records including surveys, instrumentation calibration, and daily source checks;
- Review and retention of Health & Safety plans and employee training records provided by OU-1 subcontractors where applicable.

Attachment 1

Legal Compliance Register

Attachment 2

Training Matrix

Appendix H – Supporting Plans

- H.1 – Radiation Safety Plan
- H.2 – West Lake Site Management Plan (Current Applicable Version Submitted Under Separate Cover)
- H.3 – West Lake Emergency Response Plan (Current Applicable Version Submitted Under Separate Cover)

H.1 – Radiation Safety Plan

Radiation Safety Plan for Operable Unit-1

1157-I-001

Prepared for:

WEST LAKE LANDFILL SUPERFUND SITE
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

June 8, 2020

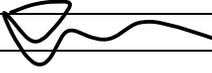
Prepared by:



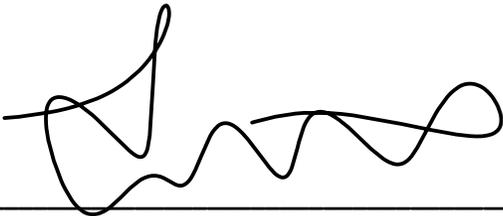
AMERIPHYSICS

9111 Cross Park Drive, Suite D200
Knoxville, TN 37923
800.563.7497

RECORD OF REVISIONS

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APPROVALS

Prepared By 

 Thomas W. Hansen, Jr., OU-1 Health Physicist

06/08/2020

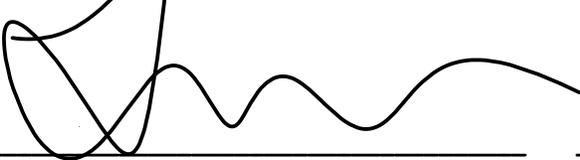
 Date

Reviewed By 

 Timothy Pratt, RSO, Ameripphysics, LLC

06/08/2020

 Date

Approved By 

 Thomas W. Hansen, Jr., President, Ameripphysics, LLC

06/08/2020

 Date

Contents

1	PURPOSE	5
2	SCOPE	5
3	RESPONSIBILITIES	6
3.1	OU-1 Site Supervisor	6
3.2	Radiation Protection Personnel	6
3.2.1	Radiation Safety Officer	7
3.2.2	Health Physicist	7
3.2.3	Radiological Control Supervisor	7
3.2.4	Health-Physics Technicians	8
3.3	Radiation Workers	8
4	RADIOLOGICAL CONTAMINANTS OF CONCERN	8
5	RADIATION PROTECTION REQUIREMENTS	9
5.1	Training Requirements	9
5.2	Occupational Exposure Limits	10
5.3	Airborne Exposure Limits	11
5.4	Site Monitoring	12
5.4.1	General Area Surveys	12
5.4.2	Personnel Exposures	12
5.4.3	Portable Air Sampling	13
6	HEALTH PHYSICS CONTROLS	13
6.1	Exposure and Contamination Control	14
6.2	Postings	15
6.3	Surveys, Monitoring, Action Levels, and Decontamination	15
6.4	Survey Instrumentation	17
6.5	Access Control Points	17
6.6	Visitors	18
7	RECORD KEEPING	18
8	COMMUNICATIONS TO EPA	19
9	EMERGENCY RESPONSE	19

Abbreviations and Acronyms

ALARA	As Low As Reasonably Achievable
ALI	Annual Limit on Intake
Ameriphysics	Ameriphysics, LLC
CFR	Code of Federal Regulations
CHP	Certified Health Physicist
cm ²	square centimeters
DAC	Derived Air Concentration
dpm	Disintegration Per Minute
EPA	Environmental Protection Agency
ICRP	International Commission on Radiological Protection
μCi	microcurie
μCi/ml	microcurie per ml
MDNR	Missouri Department of Natural Resources
NRC	U.S. Nuclear Regulatory Commission
OU	Operable Unit
PPE	Personal Protective Equipment
RCA	Radiologically Controlled Area
RCM	Ameriphysics' Radiological Control Program Manual
RCP	Radiological Control Procedure
RCS	Radiological Control Supervisor
RIM	Radiologically Impacted Material
RSO	Radiation Safety Officer
RSP	Radiation Safety Plan
RWP	Radiation Work Permit
Site	West Lake Landfill Site
TEDE	Total Effective Dose Equivalent

1 PURPOSE

The West Lake Landfill Superfund Site (Site) currently consists of three operable units (OUs). OU-1 primarily addresses two disposal areas at the West Lake Landfill, known as Areas 1 and 2, that have been identified as containing radiologically impacted material (RIM). OU-2 consists of portions of the Site that have not been identified as containing RIM. OU-3 addresses groundwater associated with the Site, including the groundwater immediately beneath Areas 1 and 2. The United States Environmental Protection Agency (USEPA) is the Site's lead regulatory agency for the remedial activities and investigations at the Site, with certain responsibilities deferred to the Missouri Department of Natural Resources (MDNR).

Areas 1 and 2 are specifically designated as radiologically controlled areas (RCAs) because of the potential for workers within their boundaries to contact or disturb RIM. Consequently, any access to, egress from, and work within these areas will be controlled according to a radiation protection program conforming to Title 10, Code of Federal Regulations (CFR), § 20.1101. On a case-by-case basis, areas outside of Areas 1 and 2, such as the Buffer Zone, Lot 2A2, and adjacent property(ies), may be designated RCAs and controlled accordingly when there is concern that work in such areas exhibits a reasonable potential to disturb RIM.

Ameriphysics, LLC (Ameriphysics) is a Nuclear Regulatory Commission (NRC) licensee, and it maintains an NRC approved and audited § 20.1101-based radiation protection program that will be used to control work within RCAs. Ameriphysics' program is described in its Radiological Control Program Manual (RCM) and implementing Radiological Control Procedures (RCPs).

The purpose of this Radiation Safety Plan (RSP) is to describe the site-specific controls that are necessary to implement the existing Ameriphysics radiation protection program at the Site. The Ameriphysics RCM and RCPs will be submitted to USEPA in their entirety under separate cover; however, they will be onsite and available for use and reference whenever work is accomplished according to this RSP.

2 SCOPE

This RSP is applicable to any activities requiring access to OU-1 Areas 1 and 2 or otherwise demonstrating a reasonable potential to disturb RIM, such as near-surface disturbances of soil in the Buffer Zone and Lot 2A2 and borings near the Area 1 and 2 fence line. Specific activities requiring radiological controls include, but are not limited to:

- Work area visits and surveys;
- Work area preparations;
- Invasive subsurface activities such as sampling and drilling operations;
- Above-ground monitoring or sampling activities associated with air, stormwater, or other media;

- Maintenance/repair of the engineered cover within the Areas;
- Movement and storage of equipment that may be impacted by contact with RIM;
- Monitoring and decontamination of equipment; and
- General monitoring of radiological conditions and personnel.

This RSP is intended to be used with the most recent versions of any health and safety and other site-specific plans that describe Areas 1 and 2, work that will be conducted, and other organizational aspects. Consequently, the scope of this RSP is limited to the particular instructions that are needed to implement the Ameripysics Radiation Protection Program at the Site.

3 RESPONSIBILITIES

All employees and visitors are responsible for working safely and acting in a manner that does not jeopardize their safety, the safety of others, or the quality of the environment. They are responsible to immediately report unsafe conditions to their supervisor or site contact, whether radiological or due to general safety conditions. All persons have the right and obligation to pause work if unsafe conditions are suspected, and such stop-work authority is conveyed without fear of reprisal. Other job-specific responsibilities are described in the sections that follow.

3.1 OU-1 Site Supervisor

The OU-1 Site Supervisor is responsible for providing access and egress to any person or organization requiring access to Areas 1 and 2, including the necessary monitoring and support required by this RSP.

3.2 Radiation Protection Personnel

Ameripysics will provide radiological oversight and support for activities conducted in Areas 1 and 2 or deemed as potentially involving RIM. Ameripysics will be responsible for assessing radiological conditions, specifying required controls, conducting radiological training, performing radiological surveys, specifying protective clothing requirements, determining personnel exposure monitoring requirements, and monitoring persons, vehicles and equipment for contamination.

Ameripysics will provide radiological support to the project with the following organizational elements and required monitoring equipment.

3.2.1 Radiation Safety Officer

Ameripysics' Radiation Safety Officer (RSO) is responsible for executive-level administration of the corporate radiological control program in accordance with prevailing procedures and industry practices. Specific responsibilities include the following:

- Establishing standards and guidelines for radiological operations;
- Limiting occupational radiation exposures to levels that are as low as reasonably achievable (ALARA);
- Suspending any operation that presents a radiological or safety threat to employees, the environment, or the general public;
- Ensuring the quality of protective equipment for personnel and prescribing usage standards;
- Establishing procedures for radiological protection and monitoring; and
- Overall responsibility for the radiation protection training program.

Tim Pratt is Ameripysics' corporate RSO. Because he is an executive-level manager, he does not need to be present in the field, and his work will be conducted from Ameripysics' corporate office in Knoxville, TN.

3.2.2 Health Physicist

The project will be supported by a Certified Health Physicist (CHP) that is responsible for any professional-level validation that arises over the course of the project. The project Health Physicist is Tom Hansen, Jr., PhD. Support from the Health Physicist may be accomplished offsite.

3.2.3 Radiological Control Supervisor

A Radiological Control Supervisor (RCS) reports to the RSO and oversees field implementation of the radiological control and safety program at the project level. Such implementation is described in Sections 0, 6, 7, and 9 of this RSP and the current version of Ameripysics RCM and implementing RCPs. The RCS has the authority to, and shall, order any operations suspended when such operations present an imminent radiological or safety threat or hazard to employees, the environment, or the public.

An RCS will be onsite any time work exhibiting a potential to disturb RIM is conducted. If the designated RCS must be away from the Site, his or her responsibilities will temporarily be assigned to an appropriately experienced Health-Physics Technician so that continuity of radiological supervision is always maintained. The designated RCS is only allowed to temporarily pass his or her responsibilities onto an individual that the RSO has approved to serve in such a capacity.

Because the complexity of the work may vary vastly as the project unfolds, and work occurring in multiple areas may reflect a need for more than one RCS, a specific person is not named by this RSP as the sole RCS representing the radiation protection organization. Instead, the RSO will propose and the Health Physicist will approve any person serving the project in the role of RCS. The proposal and approval will be in writing. This requirement does not preclude the RSO or project Health Physicist from serving as an RCS.

3.2.4 Health-Physics Technicians

Health-Physics Technicians are assigned by the RCS for specific day-to-day oversight of radiological workers and radiological operations. They act as the RCS's representative(s) in specifically implementing the radiological control and safety practices as assigned.

3.3 Radiation Workers

Radiation Workers are any persons, regardless of employer, who engage in work activities in RCAs and are not classified as visitors by the RCS according to Section 6.6 of this RSP. Radiation Workers will follow the instructions from Radiation Protection Personnel but do not perform the duties assigned to Radiation Protection Personnel unless specifically authorized to do so by the RCS.

4 RADIOLOGICAL CONTAMINANTS OF CONCERN

The occurrences of RIM have been identified to consist of radionuclides in the uranium (U-238) decay series. Radionuclides from the actinium (U-235) and thorium (Th-232) decay series are also present above mean background concentrations, although at a lesser frequency and lower activity levels. Important radionuclides comprising these decay series are listed in Table 1 of the September 2018 Record of Decision Amendment. These radionuclides and corresponding properties from International Commission on Radiological Protection (ICRP) Publication 107, *Nuclear Decay Data for Dosimetric Calculations*, are demonstrated on Table 1.

Table 1. Radionuclides of Concern

Nuclide	Half-Life ¹	Decay Mode ² (Fraction)	Energy Emitted (MeV/transformation)			
			Alpha	Electron	Photon	Total
Uranium Series						
U-238	4.468E+9 y	A (1.00) SF (5.5E-07)	4.2584	0.0092	0.0014	4.2691
Th-234	24.10 d	B- (1.00)	-	0.0622	0.0105	0.0728
Pa-234	6.70 h	B- (1.00)	-	0.4037	1.4718	1.8755
U-234	2.455E+5 y	A (1.00)	4.8430	0.0137	0.0020	4.8587
Th-230	7.538E+4 y	A (1.00)	4.7538	0.0146	0.0018	4.7702
Ra-226	1600 y	A (1.00)	4.8603	0.0039	0.0074	4.8716
Pb-214	26.8 m	B- (1.00)	-	0.2948	0.2533	0.5481

Nuclide	Half-Life ¹	Decay Mode ² (Fraction)	Energy Emitted (MeV/transformation)			
			Alpha	Electron	Photon	Total
Bi-214	19.9 m	B- (1.00) A (2.1E-4)	0.0012	0.6631	1.4793	2.1436
Pb-210	22.20 y	B- (1.00) A (1.9E-8)	<0.0001	0.0404	0.0053	0.0457
Actinium Series						
U-235	7.04E+8 y	A (1.00)	4.4693	0.0530	0.1669	4.6891
Th-231	25.52 h	B- (1.00)	-	0.1622	0.0269	0.1891
Pa-231	3.276E+4 y	A (1.00)	5.0592	0.0538	0.0450	5.1580
Ac-227	21.772 y	B- (0.99) A (0.01)	0.0693	0.0150	0.0011	0.0853
Th-227	18.68 d	A (1.00)	5.9883	0.0755	0.1317	6.1955
Ra-223	11.43 d	A (1.00)	5.7702	0.0781	0.1413	5.9895
Pb-211	36.1 m	B- (1.00)	-	0.4543	0.0644	0.5187
Bi-211	2.14 m	A (1.00) B- (2.8E-3)	6.6757	0.0100	0.0473	6.7330
Thorium Series						
Th-232	1.405E+10 y	A (1.00)	4.0688	0.0126	0.0015	4.0829
Ra-228	5.75 y	B- (1.00)	-	0.0132	0.0031	0.0163
Ac-228	6.15 h	B- (1.00)	-	0.4495	0.8671	1.3166
Th-228	1.9116 y	A (1.00)	5.4956	0.0210	0.0036	5.5202
Ra-224	3.66 d	A (1.00)	5.7766	0.0023	0.0104	5.7893
Pb-212	10.64 h	B- (1.00)	-	0.1766	0.1450	0.3217
Bi-212	60.55 m	B- (0.64) A (0.36)	2.2164	0.5046	0.1038	2.8247
Tl-208	3.053 m	B- (1.00)	-	0.6113	3.3603	3.9716

¹ Key to half-life: h is hours, m is minutes, d is days, and y is years

² Key to decay mode: A is alpha, B- is beta minus, SF is spontaneous fission

Because of their prevalence, Th-230 and Ra-226, including their respective decay products, are the primary radionuclides of concern. These isotopes and their associated decay products account for more than 95% of the total risk to target receptors. Th-230 activities are greater than the Ra-226 activities and are not in equilibrium.

5 RADIATION PROTECTION REQUIREMENTS

5.1 Training Requirements

Persons must possess the Radiation Safety Training required by Ameriphsysics procedure RCP 2-1, *Radiation Safety Training Procedure*, in order to access RCAs unless designated as visitors

according to Section 6.6 of this RSP and escorted. The training and a certificate of completion will be provided by Ameriphsysics.

Workers who receive or are likely to receive an occupational effective dose equivalent in excess of 0.1 rem in one year are provided Radiation Worker Training. The approximately 1-day course familiarizes trainees with the following concepts:

- Radiation and its effects on the body;
- Federal dose limits and administrative controls;
- ALARA and personnel monitoring programs;
- Radiological postings;
- Contamination controls; and
- Federal and state regulations.

A worker who is not likely to receive an occupational effective dose equivalent in excess of 0.1 rem in one year is provided Radiation Awareness Training. This training familiarizes workers with site hazards and provides instructions for avoiding contact with radioactive material and for keeping individual doses less than 0.1 rem.

The initial Radiation Safety Training required by this section shall consist of instructor-led training and may be provided by personnel qualified at a minimum as a Health Physics Technician. This training may be administered at any location, provided additional training is administered covering any specific procedures in effect for jobsite operations. Qualification is good for one year and is attained by completing the required coursework and passing a written examination with a score of 70 percent or better. Requalification can be attained by completing the exam in lieu of classroom training, provided a passing score is attained on the first attempt, correct responses to missed questions are reviewed with the trainee, and any new rules or revisions to the radiation safety program are explained.

Position-specific training and qualifications required for persons described in Section 3.2 are described in Section 2 of Ameriphsysics' RCM.

5.2 Occupational Exposure Limits

Occupational dose limits for adults are set forth in 10 CFR § 20.1201, and the dose limit for the embryo/fetus of a declared pregnant woman is specified in 10 CFR § 20.1208. As a measure to prevent exceeding these limits, Administrative Limits equal to 80% of the prescribed limits are used. These limits are tabulated in Table 2.

Table 2. Occupational Dose Limits

	Occupational Dose	Administrative Limit
Total effective dose equivalent (TEDE)	5 rem/yr	4 rem/yr
Sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye	50 rem/yr	40 rem/yr
Skin (shallow-dose equivalent)	50 rem/yr	40 rem/yr
Lens of the eye (shallow-dose equivalent)	15 rem/yr	12 rem/yr
Dose equivalent to the embryo/fetus	0.5 rem for entire pregnancy	0.4 rem for entire pregnancy

An ALARA goal of 0.1 rem/yr TEDE is initially established for the Site, meaning no person is allowed to exceed this goal without the consent of the RSO. The ALARA goal should be reviewed annually to make sure it is reasonable and adjusted according with concurrence from the RSO.

5.3 Airborne Exposure Limits

Airborne radioactive material means radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors or gases.

Airborne radioactivity area means a room, enclosure, or area in which airborne radioactive materials exist in concentrations:

1. In excess of the derived air concentrations (DAC) specified in Appendix B to 10 CFR § 20; or
2. To such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC-hours.

ALI means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 5 rems or a committed dose equivalent of 50 rems to any individual organ or tissue. The unit for ALI is the microcurie (μCi).

DAC means the concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work, results in an intake of one ALI. The unit for DAC is μCi per milliliter ($\mu\text{Ci}/\text{ml}$).

DAC-hour is the product of the concentration of radioactive material in air (expressed as a fraction or multiple of the derived air concentration for each radionuclide) and the time of exposure to that radionuclide, in hours. Thus, 2,000 DAC-hours is one ALI, equivalent to a committed effective dose equivalent of 5 rems.

The most-restrictive stochastic inhalation ALIs and DACs from 10 CFR § 20, Appendix B, for site-specific radionuclides of concern from Table 1 are shown on Table 3.

Table 3. ALIs and DACs for Radionuclides of Concern

Uranium Series			Actinium Series			Thorium Series		
Nuclide	ALI (μCi)	DAC (μCi/ml)	Nuclide	ALI (μCi)	DAC (μCi/ml)	Nuclide	ALI (μCi)	DAC (μCi/ml)
U-238	1E+0	6E-10	U-235	1E+0	6E-10	Th-232	1E-3	5E-13
Th-234	2E+2	8E-8	Th-231	6E+3	3E-6	Ra-228	1E+0	5E-10
Pa-234	8E+3	3E-6	Pa-231	2E-3	6E-13	Ac-228	9E+0	4E-9
U-234	1E+0	5E-10	Ac-227	4E-4	2E-13	Th-228	1E-2	4E-12
Th-230	6E-3	3E-12	Th-227	3E-1	1E-10	Ra-224	2E+0	7E-10
Ra-226	6E-1	3E-10	Ra-223	7E-1	3E-10	Pb-212	3E+1	1E-8
Pb-214	8E+2	3E-7	Pb-211	6E+2	3E-7	Bi-212	2E+2	1E-7
Bi-214	8E+2	3E-7	Bi-211	4E-4	2E-13	Tl-208	2E+2	1E-7
Pb-210	2E-1	1E-10						

As explained in Section 4, the principal radionuclides of concern are Th-230, Ra-226, and their progeny. Of these radionuclides, the most restrictive ALI (i.e., 6E-3 μCi) and DAC (i.e., 3E-12 μCi/ml) are for the radionuclide Th-230. Consequently, the Th-230 values will be used for planning and evaluating airborne radioactivity controls unless isotopic analysis of perimeter air samples indicates that another radionuclide is the principal airborne concern.

Personal protective equipment (PPE), i.e., Tyvek® clothing and respiratory protection, should be used only after the RCS is convinced that the organization responsible for the work activity has made a reasonable effort to control the hazard otherwise. The use of respiratory protection equipment is not anticipated for this project. The RSO will be consulted to establish appropriate controls and protections if airborne concentrations exceeding 10% of the DAC are encountered.

5.4 Site Monitoring

5.4.1 General Area Surveys

The purpose of a general area survey is to characterize the ambient radiation environment of the entire Site and not just the immediate work area. The frequency of these surveys will be determined by the RCS, but will include, at minimum, surveys at the beginning and the end of any major work activity and when substantive changes are made to the Site. These surveys will be made with a Ludlum Model 19 or equivalent that is setup and operated according to Ameripysics Procedure RCP 4-3, *Survey Instrument Procedure*.

5.4.2 Personnel Exposures

In accordance with 10 CFR 20.1502(a), *Conditions requiring individual monitoring of external and internal occupational dose*, external exposure dosimetry shall be worn by:

1. Adults likely to receive, in 1 year from sources external to the body, a dose in excess of 0.5 rem per year;
2. Declared pregnant women likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem; and
3. Individuals entering a high or very high radiation area as defined by 10 CFR § 20.1003, *Definitions*.

Minors are also required to wear external exposure dosimetry if they are likely to receive, in one year from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem, a lens dose equivalent in excess of 0.15 rem, or a shallow dose equivalent to the skin or to the extremities in excess of 0.5 rem; however, the presence of minors at the Site is not anticipated. Permanent-record dosimetry shall be issued by Ameripysics to each individual that is required by this section to wear external exposure dosimetry. When a dosimeter is issued, the individual will be briefed on its proper use and care. A dosimeter can only be worn by the person to which it is assigned. The dosimeters will be returned to Ameripysics at the end of the work activity or at the end of the shift, as required by the RCS. If a dosimeter is lost, the individual shall immediately leave the area and notify the RCS so an investigation can be conducted.

The RSO will report individual monitoring results to workers annually and at the request of any individual formerly wearing dosimetry provided by Ameripysics. These reports are provided directly to the monitored individuals and not their employers unless the worker directs the RSO otherwise in writing.

5.4.3 Portable Air Sampling

Airborne particulate surveys shall be performed by Radiation Protection Personnel daily in the vicinity of any work that exhibits a potential to disturb RIM. These surveys will be performed according to Ameripysics procedure RCP 4-4, *Airborne Radioactivity Control Procedure*. The use of personnel air samplers is not anticipated.

The system used for counting air samples shall be capable of achieving a minimum detectable concentration not greater than 10% of the applicable DAC. Because the DAC values for radionuclides present in RIM are so low, it may be necessary to obtain samples for more than one shift or day to obtain sufficient volume.

6 HEALTH PHYSICS CONTROLS

Maintaining personnel exposures ALARA is the primary goal of this RSP. This is accomplished with a combination of engineering and administrative controls.

6.1 Exposure and Contamination Control

Work in areas where RIM is handled, used, or stored shall be performed in accordance with approved procedures and work instructions to ensure that the regulatory limits in Section 4.2 are maintained. Ameriphysics procedure RCP 4-1, *Exposure and Contamination Control Procedure*, describes in detail procedures for:

- Working in an RCA;
- Proper use of a radiation work permit (RWP);
- Access control point;
- Shielding;
- Administrative controls;
- Engineering controls; and
- Postings and labels.

A few of the engineering controls that may be implemented to ensure worker doses are ALARA include:

- Wetting of soil to minimize the suspension of contaminated material;
- Use of berms and coverings as appropriate during operations; and
- Using mechanical equipment to handle contaminated material rather than by hand.

The following lists administrative controls that will be implemented to ensure worker doses are ALARA.

- Any work activities conducted in Areas 1 or 2 or involving a potential to handle RIM will be defined and delineated using job-specific RWPs;
- All nonessential personnel will be restricted from RCAs;
- No eating, drinking or smoking will be allowed in RCAs; and
- Individuals will, to the extent practical, remain up-wind of surface preparation, sampling and material handling operations.

The RCS ensures that engineering and administrative controls are sufficient to maintain worker protection. In doing so, the RCS coordinates with the OU-1 Site Supervisor and other supervisory personnel to ensure that controls are understood, effective, and not unnecessarily impeding work.

6.2 Postings

Areas where radiation or the potential for radiation exist will be posted in accordance with 10 CFR § 20.1902, *Posting requirements*. The following postings are likely or possible based on known contaminants and concentrations.

- Each radiation area will be posted with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA." Radiation area means an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.
- Each airborne radioactivity area (as defined in Section 5.3) will be posted with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, AIRBORNE RADIOACTIVITY AREA" or "DANGER, AIRBORNE RADIOACTIVITY AREA."
- Unless already posted as a radiation area or airborne radioactivity area, each RCA will be posted with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL(S)" or "DANGER, RADIOACTIVE MATERIAL(S)."

6.3 Surveys, Monitoring, Action Levels, and Decontamination

Radiological surveys are performed by Radiation Protection Personnel as necessary to ensure personnel do not exceed radiation exposure limits, to meet requirements for posting radiation areas, and to control the spread of contamination. These surveys shall be performed at prescribed locations and intervals according to approved procedures. These procedures are described in detailed in Ameriphysics procedure RCP 4-2, *Surveys and Monitoring Procedure*.

Area radiation surveys are performed by Radiation Protection Personnel:

1. Daily, at boundaries and access control points of radiation areas;
2. Weekly, in occupied radiation areas, areas where radioactive material and waste is stored, and at boundaries of work sites where the public could be exposed;
3. Whenever operations are performed that might be expected to change existing radiation levels;
4. When highly radioactive equipment (i.e., radiation level at 30 cm is greater than 0.1 rem per hour) is moved; and
5. When performing operations that could result in personnel being exposed to small intense beams of radiation.

Surface contamination surveys are performed by Radiation Protection Personnel:

1. Prior to initial entry to an area where contamination is possible;
2. In-process to verify appropriateness of contamination controls, control processes, direct remedial efforts, and free release items or areas.

Removable contamination surveys are performed by Radiation Protection Personnel:

1. Daily, in active work areas where contamination is possible and at access control points;
2. Weekly, in areas where handling of RIM occurs and areas where RIM is stored; and
3. In-Process, during any of the following:
 - a. Decontamination and release of equipment;
 - b. In areas where airborne radioactivity has exceeded the concentrations specified in Ameriphsysics procedure RCP 4-4, *Airborne Radioactivity Control Procedure*; and
 - c. When determining the need for anti-contamination clothing and to determine the extent of contamination in an area.

Removable contamination is evaluated by obtaining representative wipes and counting the contamination on the wipe using a Ludlum 3030E or equivalent.

All vehicles and equipment entering Areas 1 or 2 will be surveyed by a qualified Health Physics Technician for alpha and beta contamination before its initial entrance as well as when exiting the area. The survey will be conducted using a Ludlum Model 2360 coupled to a Model 43-93 (or equivalent). A removable contamination survey is also required for any vehicles or equipment leaving the Site.

Radiological surveys of any drilling or sampling equipment and cores, borehole cuttings, and other investigation-derived waste will be performed in the immediate vicinity of the work activity location (i.e., this material and equipment will be surveyed before it is moved).

Ameriphsysics' surface contamination survey limits are based on Regulatory Guide 1.86, Table 1, *Acceptable Surface Contamination Limits*. These limits are commensurate with limits from Regulatory Guide 8.23, Table 3, *Acceptable Surface Contamination Levels for Uncontrolled Release of Equipment*. Of the known Site contaminants, the most restrictive limits for alpha-emitting nuclides are 100 disintegrations per minute (dpm)/100 cm² total activity and 20 dpm/100 cm² removable activity, and the most restrictive limits for beta-emitting nuclides are 1,000 dpm/100 cm² total activity and 200 dpm/100 cm² removable activity. These limits serve as the action levels at which decontamination of equipment is required. Radiation Protection Personnel will decide if decontamination can be accomplished or assisted by persons qualified as Radiation Workers. For example, it is reasonable to expect Radiation Workers to be able to clean equipment that is contaminated with materials they are already authorized to handle during their regular work. Nonetheless, Radiation Workers will not undertake decontamination on their own without authorization.

Surveys of personnel (i.e., "frisking") will be performed when exiting an RCA. The type of scan (i.e., whole body, hand and foot, etc.) will be designated on the RWP. Unlike surveys of equipment, the action level for contamination of skin or clothing is any detectable

contamination. Radiation Workers will not attempt to decontaminate themselves; only Radiation Protection Personnel are allowed to decontaminate people.

Ameripysics procedure RCP 4-9, *Decontamination Procedure*, describes general techniques for decontamination. Due to the nature of the work that is planned and the physical characteristics of the RIM, decontamination beyond basic tape-presses or cleaning with damp cloths and a mild over-the-counter detergent is not expected.

6.4 Survey Instrumentation

Radiation Protection Personnel will make an adequate number of calibrated radiation detection and measurement instruments available. Instruments shall be calibrated at least annually or after each repair. Instruments will be checked before use according to Ameripysics procedure RCP 4-3, *Survey Instrument Procedure*.

6.5 Access Control Points

An access control point is a location on the perimeter of an RCA through which all entries and exits are made and where precautions are taken to prevent unnecessary exposure or the spread of radioactive contamination to adjacent uncontaminated areas.

The following items outline the basic considerations for establishing an access control point:

1. Determine the extent of the area to be isolated and the location where entry and exit shall be controlled;
2. Plan for physical boundaries to prevent inadvertent or unauthorized access. Boundaries shall be conspicuously marked and posted;
3. Cover the floor of the control point using paper or plastic sheet or other material provided for this purpose (optional in outdoor areas). The intent is to provide an easily removable walking surface within the control point to prevent tracking of contamination from the area. Maintain a supply of the material to replace floor covering as necessary;
4. Provide a “step-off pad” at the exit from the control point (optional in outdoor locations). This is to be used when removing clothing during exit from the area;
5. Provide easily accessible receptacles for used PPE, respirators, and equipment at the control point. A supply of plastic bags shall be available as necessary for receiving contaminated equipment and tools. Radiation tags or labels shall be available to identify contaminated items being removed from the area;
6. Provide radiation detection instruments for monitoring personnel and equipment. Frisking should be performed in a low radiation background and where the audible response of the frisker can be heard;

7. Provide means of recording stay times, as may be required, at the entrance of the areas for personnel. It may be necessary to provide a record of previous radiation exposures received by personnel entering an RCA so that maximum allowable time in the RCA can be determined;
8. At the entrance to the access control point, information shall be posted concerning radiation and contamination conditions, precautions for entry, precautions for exit, step-off points, clothing and waste receptacles, and personnel survey. A copy of the applicable RWP shall be posted at the access control point;
9. Radiological Protection Personnel shall designate, stock, staff, and otherwise maintain the control point;
10. Only personnel in assigned PPE should enter RCAs;
11. Adequately trained personnel may be permitted to assist in frisking other personnel and themselves; and
12. Contaminated individuals shall be processed in accordance with Ameriphysics procedure RCP 4-9, *Decontamination Procedure*.

6.6 Visitors

Management, technical, and other personnel who require occasional access to RCAs and areas where RIM is stored and who enter these for observation or similar purposes, or to perform work not involving RIM, shall have the radiological control training necessary for the radiological conditions expected to be encountered or shall be escorted by appropriately qualified personnel at all times. The RCS or designee will be required to escort all visitors, and these personnel are not allowed to receive an exposure exceeding the 10 CFR § 20.1301, *Radiation Dose Limits for Individual Members of the Public*, of 0.1 rem per year or 0.002 rem in any one hour.

7 RECORD KEEPING

Ameriphysics is required to maintain and retain records of the radiation protection program and to make certain notifications. The RSO is responsible for administering the program, and the RCS is responsible for maintaining radiation protection project records generated during the project. Records shall be maintained in accordance with Ameriphysics' Quality Assurance Manual Section 17.

Radiological records are retained according to Table 4.

Table 4. Project Records Retention

Record	Retention Period
Characterization Records	7 years
Background Data	7 years
Calibration Records	Permanent
Instrument Setup Sheets	Permanent

Daily Instrument Checks	Permanent
Survey Logs	Permanent
Survey Raw Data	7 years
Surveys	Permanent
Field Log Books	Permanent
Chain of Custody Forms	Permanent
Laboratory Reports	Permanent
Radiation Work Permit Logs	Permanent
Radiation Work Permits	Permanent
Air Sample Logs	Permanent
Air Sample Results	Permanent
Dosimetry Records	Permanent
Exposure Reports	Permanent
Pathway Models	Permanent

8 COMMUNICATIONS TO EPA

As USEPA is not able to fully understand and evaluate the effectiveness of the site-specific RSP without site-specific information, Ameriphysics will provide USEPA with any filled-out Project ALARA Assessment forms (RCF 3-6) or Radiation Work Permit (RCF 4-2). These documents will be provided to the USEPA via email for review within one business day of being completed. In addition, other records generated by the radiation control program (see Table 4) will be provided to the USEPA upon request in a reasonable time frame.

9 EMERGENCY RESPONSE

The Site operates according to an Emergency Response Plan that describes the procedures that will be used in the event of an accident or emergency at OU-1. In the event of a medical emergency, fire, explosion, or other emergency event potentially involving RIM, priority shall always be given to injured personnel and personnel safety, then to combating of the fire or other emergency. Radiological controls shall be given secondary importance to these tasks.

H.2 – West Lake Site Management Plan (Current Applicable Version Submitted Under Separate Cover)

H.3 – West Lake Emergency Response Plan (Current Applicable Version Submitted Under Separate Cover)

Appendix I – SSHEP Frontz and Bulldog

Information Required in an SSHEP

Section	Title	Section	Title
1	Project Owner, Project Name, and Contractor’s Safety, Health, and Environmental Policy Statement	11	Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions
2	Scope of Work Evaluation	12	Employee Participation and Consultation
3	Responsibility and Identification of Key Personnel	13	Emergency Action Plan
4	Overall Assessment of SH&E Hazards, Exposures, and Risks	14	Site-specific Medical Emergency Plan
5	Relevant SH&E Compliance Programs, Associated Compliance Information, and Personnel Responsibility Assignments	15	Incident Reporting, Investigation, and Corrective Action Processes
6	SH&E Compliance Training Matrix and Training / Education Processes	16	Work Site Inspection and Program Audit Processes
7	Site-specific Worker Orientation Program	17	Progressive Disciplinary Program
8	Identification of Competent / Qualified Personnel	18	Recordkeeping / Document Retention Processes
9	Hazard Identification, Notification, and Correction Process	19	Other (as defined by Contractor or Parsons)
10	Specific Hazard and Risk Control Measures (e.g., Activity Hazard Analyses, Operational Risk Management Processes)	20	Other (as defined by Contractor or Parsons)

Date: <u>6/16/2020</u>			Project/Location: <u>West Lake Landfill OU-1 Design Investigation</u>		
Contractor Name: <u>Frontz Drilling, Inc.</u>			Parsons SH&E Representative: _____		
<p>The information provided here is based on a review of the contractor site-specific safety, health, and environmental plan (SSHEP). Areas identified as incomplete shall be revised based on the standards in the contract specifications and the project safety, health, and environmental plan (PSHEP). Contractors shall resubmit revised sections of the SSHEP to the project manager within 1 week of receiving this review documentation.</p>					
Section	Complete	Incomplete	Section	Complete	Incomplete
Statement of SH&E Policy	<input type="checkbox"/>	<input type="checkbox"/>	Specific Activity Hazard Analyses (AHAs) and Operational Risk Assessments	<input type="checkbox"/>	<input type="checkbox"/>
Scope of Work Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	Adequate Hazard / Risk Controls	<input type="checkbox"/>	<input type="checkbox"/>
Key Line Personnel Identified	<input type="checkbox"/>	<input type="checkbox"/>	2-Week Look-ahead Planning	<input type="checkbox"/>	<input type="checkbox"/>
Overall Assessment of Hazards and Risks	<input type="checkbox"/>	<input type="checkbox"/>	Employee Participation and Consultation	<input type="checkbox"/>	<input type="checkbox"/>
Relevant SH&E Compliance Programs (Hazard Communication, PPE, HAZWOPER, Hazardous Energy Control, Fall Protection, Confined Space Entry, RCRA, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Action Plan	<input type="checkbox"/>	<input type="checkbox"/>
SH&E Compliance Program Responsibilities Assigned	<input type="checkbox"/>	<input type="checkbox"/>	Site-specific Medical Emergency Plan	<input type="checkbox"/>	<input type="checkbox"/>
Compliance Training and Education Programs	<input type="checkbox"/>	<input type="checkbox"/>	Incident Reporting, Investigation, and Corrective Action Processes	<input type="checkbox"/>	<input type="checkbox"/>
Site-specific Worker Orientation Program	<input type="checkbox"/>	<input type="checkbox"/>	Work Site Inspection and Program Audit Processes	<input type="checkbox"/>	<input type="checkbox"/>
Competent and Qualified Personnel Identified	<input type="checkbox"/>	<input type="checkbox"/>	Progressive Disciplinary Program	<input type="checkbox"/>	<input type="checkbox"/>
Hazard Identification, Notification, and Correction Process	<input type="checkbox"/>	<input type="checkbox"/>	Recordkeeping / Document Retention Processes	<input type="checkbox"/>	<input type="checkbox"/>
Additional Comments / Other SSHEP Sections or Information Required					

Reviewed by:					
Name		Title			
_____		_____			

Frontz Drilling, Inc.

West Lake Landfill OU-1 Design Investigation

Contractor Site-specific Safety, Health, and
Environmental Plan (**SSHEP**)

June 2020

Table of Contents

Contractor's Safety, Health, and Environmental Policy Statement	5
Scope of Work Evaluation	6
Responsibilities and Identification of Key Personnel.....	7
Overall Assessment of SH&E Hazards, Exposures, and Risks	8
SH&E Compliance Programs	9
SH&E Compliance Training Matrix and Training / Education Processes.....	10
Site-specific Worker Orientation Program.....	11
Identification of Competent / Qualified Persons	12
Hazard Identification, Notification, and Correction Process.....	13
Specific Hazard and Risk Control Measures	14
Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions.....	15
Employee Participation and Consultation	16
Emergency Action Plan	17
Site-specific Medical Emergency Plan	18
Incident Reporting, Investigation, and Corrective Action Processes	19
Work Site Inspection and Program Audit Process.....	20
Progressive Disciplinary Program.....	21
Recordkeeping / Document Retention Processes	22
Appendices.....	23

Contractor's Safety, Health, and Environmental Policy Statement

This plan contains the minimum requirements for an effective contractor site-specific safety, health, and environmental Plan (SSHEP) by Frontz Drilling, Inc. for the West Lake Landfill OU-1 Design Investigation. This SSHEP shall be implemented and maintained by Frontz Drilling, Inc. This SSHEP applies to all persons of our company.

The leadership team is responsible for ensuring that all SH&E policies and procedures are clearly communicated and understood by all employees. Managers and supervisors are expected to enforce the rules fairly and uniformly.

All employees are responsible for using safe work practices, following all directives, policies and procedures, and assisting in maintaining a safe work environment.

Our system of ensuring that all workers comply with the rules and maintain a safe work environment includes the following.

- Informing workers of the provisions of this SSHEP
- Evaluating the SH&E performance of all workers
- Recognizing employees who consistently perform SH&E work practices very well
- Providing training to workers whose SH&E performance is deficient
- Disciplining workers for failure to comply with safe, healthful, and environmentally responsible work practices

Scope of Work Evaluation

Field tasks to be performed by Frontz Drilling, Inc. during the West Lake Landfill OU-1 Design Investigation will include the following:

Task 1 – Advance continuously sampled boreholes, in 4-ft intervals, using a sonic drill rig equipped with 4-in dia core barrels

Task 2 – Decontaminate core barrels between samples and between boreholes in accordance with the project Field Sampling Plan

Task 3 – Install temporary casing fitted with a bottom slip cap through the drill string (to facilitate downhole radiological scanning by others) and subsequently remove the 4-in drill string (and 6-in outer string if utilized) from the borehole, securing the casing to counteract buoyancy where applicable

Task 4 – Install 2-in dia piezometers in accordance with the Field Sampling Plan and other project plans

Task 5 – Plug boreholes not completed as piezometers in accordance with state regulations

Task 6 – Provide assistance to project personnel during drilling/sampling, decontamination, borehole plugging, sample handling, and radiological survey/scanning activities as needed

Responsibilities and Identification of Key Personnel

These personnel have authority and responsibility to implement this program.

Contractor:	Frontz Drilling, Inc.	
Address:	2031 Millersburg Rd. Wooster, OH, 44691	
Telephone	Fax	Email
330-262-5301	330-264-7274	swright@frontzdrilling.com
Company Executive responsible for project		Contact No.
Stephen Wright		Direct Line: 330-262-5301 Cell Phone: 330-465-6685 Email: swright@frontzdrilling.com
Manager/Superintendent:		Contact No.
Stephen Wright		Direct Line: 330-262-5301 Cell Phone: 330-465-6685 Email: swright@frontzdrilling.com
Safety Representative/Manager:		Contact No.
Stephen Wright		Direct Line: 330-262-5301 Cell Phone: 330-465-6685 Email: swright@frontzdrilling.com
Key Foreperson or Forepersons:		Contact No.
Joe Henley		Direct Line: 330-262-5301 Cell Phone: 330-317-0089 Email: jjhenley311@hotmail.com
Client Project Management Point of Contact:		Contact No.
Stephen Wright		Direct Line: 330-262-5301 Cell Phone: 330-465-6685 Email: swright@frontzdrilling.com

All managers and supervisors are responsible for implementing and maintaining the SSHEP in their work areas and for answering worker questions about the SSHEP. Managers and supervisors shall make a copy of this SSHEP available to all workers.

Overall Assessment of SH&E Hazards, Exposures, and Risks

Task	Potential Hazards	Mitigation/Response Actions
Drilling/sampling	<ul style="list-style-type: none"> - Traversing uneven terrain - Radiological exposure inside Areas 1 / 2 from excavated materials and open boreholes - Vehicular traffic at locations near roads - Noise - Heavy equipment - Muscle strain - Pinch points - Rotating equipment/pinch points - Falling objects 	<ul style="list-style-type: none"> - Be alert to surroundings - Follow RWP and/or site PPE reqs - Hi-vis outerwear, traffic control equip - Use hearing protection - Be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Watch moving parts, overhead activity - Keep hands away from moving parts
Decontamination activities	<ul style="list-style-type: none"> - Splashing liquids - Muscle strain - Slips, trips, falls 	<ul style="list-style-type: none"> - Splash shields, spray control/avoidance - Use safe lifting technique/ergonomics - Watch footing, use slip-resistant equip
Temporary casing installation/well construction	<ul style="list-style-type: none"> - Heavy equipment - Muscle strain - Radiological exposure - Falling objects 	<ul style="list-style-type: none"> - Be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Follow RWP and/or site PPE requirements
Borehole plugging	<ul style="list-style-type: none"> - Heavy equipment - Muscle strain - Falling objects - Radiological exposure - Corrosive materials 	<ul style="list-style-type: none"> - Be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Watch moving parts - Follow RWP and/or site PPE requirements - Stand upwind or use dust masks - Wash grout off of skin

Activities shall be evaluated and activity hazards analyses (AHAs) or other effective risk management process shall be developed. AHAs are included in **Appendix 3** of this SSHEP.

SH&E Compliance Programs

Frontz Drilling, Inc. shall comply with relevant SH&E laws and regulations. Written compliance programs shall be implemented on our job sites and coordinated with other site contractors, our lower-tier subcontractors, and with Parsons, as appropriate. Our employees shall be aware of these programs, receive adequate training, and perform their work consistent with these compliance programs where applicable. Programs include but are not limited to:

- 40-Hr Hazardous Waste Operations & Emergency Response certification (HAZWOPER) in accordance with 29 CFR 1910.120 (administered by others)
- 8-Hr HAZWOPER Refresher certification within the preceding 12 months in accordance with 29 CFR 1910.120(e) and (p) (administered by others)
- Bridgeton Landfill Contractor Safety Orientation certification within the preceding 12 months (administered by Matt Stewart-Environmental Manager, Bridgeton Landfill 314-656-2130)
- Radiation Safety certification (Rad Worker, etc.) in general accordance with recommendations for instructional training described in Federal Register 52:17 p. 2832 (administered by others)

SH&E Compliance Training Matrix and Training / Education Processes

All workers, including managers and supervisors, shall receive competent and relevant site-specific SH&E training. This training shall include site-specific SH&E compliance training and general site training on SH&E best practices. Our employees shall be properly prepared for conducting their work and shall comply with the relevant SH&E programs and general site-specific SH&E practices.

A written training matrix shall be established and maintained that identifies the workers (by name or by title/role), all of the SH&E-related training they must have, and the frequency for refresher (if needed).

Training shall be provided:

- When the SSHEP is established;
- To all new workers;
- To all workers with new job assignments for which training has not been previously provided;
- When new substances, processes, procedures, or equipment are introduced to the workplace and represent a new hazard, potential exposure, or risk;
- When the employer is made aware of a new or previously unrecognized hazard, exposure, or risk;
- To familiarize supervisors with the SH&E hazards, exposures, or risk to which workers under their immediate direction and control may be exposed; and
- To all workers for hazards, exposures, or risks specific to their job assignment and in compliance with related SH&E compliance programs.

Workplace safety and health practices for all work locations shall include, at a minimum:

- An explanation of the SSHEP, the Parsons Project Safety, Health, and Environmental Plan (PSHEP), the site’s emergency action plan and fire prevention plan, and the measures to report unsafe conditions, work practices, injuries, and/or a recognized need for additional instruction;
- The general purpose, availability, use, limitations, and disposal of outerwear and personal protective equipment;
- Locations of sanitation, hand-washing, and drinking water facilities;
- Provisions for medical services and first aid, including emergency procedures;
- Response procedures for environmental spills or releases; and
- Specific instructions to workers on hazards unique to their job assignment to the extent such information is not covered in other training.

License/Certification	Employee
OSHA HAZWOPER 40-hr + 8-Hr Refresher	Joe Henley, Jeff Burnside, Kile Fisher
Radiation Safety Training	TBD
Bridgeton LF Annual H&S	Joe Henley, Jeff Burnside, Kile Fisher

Site-specific Worker Orientation Program

All new workers on our jobsite shall receive site-specific orientation training before conducting their work. This training shall consist of SH&E compliance training and general site SH&E practices related to their work.

Employees completing orientation shall acknowledge in writing completing and understanding the site-specific orientation subject matter. Employees who do not understand one or more subjects shall be retrained.

Site orientation training is provided by Matt Stewart-Environmental Manager, Bridgeton Landfill.

Identification of Competent / Qualified Persons

Contractor Competent Person Certification (United States)

Definition					
A competent person is a formally-designated person having the ability to recognize existing and predictable hazards and has the authority to correct them.					
Responsibility					
The designated contractor competent person is responsible for recognizing and correcting SH&E risks/hazards. This person has the authority to stop work due to a perceived SH&E concern on the jobsite. This contractor manager and designated competent person are considered field contacts for Parsons projects.					
This form shall be completed by each contractor manager and the contractor-designated competent person. Where a contractor is responsible for multiple crafts, it will be necessary to maintain additional designated competent persons and forms. Each contractor on a Parsons project shall submit this completed form to the Parsons project manager before beginning work on the project and must update it any time the designated competent person changes.					
Acknowledgment					
I, <u>Stephen Wright</u> representing, <u>Frontz Drilling, Inc.</u>					
Contractor Manager (Printed)			Contractor Company Name (Printed)		
have assigned <u>Joe Henley</u> to be the competent person in the areas indicated and					
Contractor Competent Person (Printed)					
I acknowledge that this individual has been thoroughly trained, is experienced in hazard recognition, and has the authority to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.					
			<u>6/16/2020</u>		
Contractor Manager (Signature)			Date		
I acknowledge that I have been thoroughly trained and have the experience to perform the duties as the competent person in the areas marked below, and I understand that I have the responsibility and authority to correct hazards and to stop work in the event of a potential hazardous or imminent danger situation.					
			<u>6/16/2020</u>		
Contractor Competent Person (Signature)			Date		
(Check the areas in which the designated competent person is permitted to execute the role of Contractor Competent Person.)					
<input type="checkbox"/>	Air Pollution and Emissions	<input type="checkbox"/>	Environmental Assessments	<input type="checkbox"/>	Mechanical Demolition
<input type="checkbox"/>	Asbestos	x	Excavations and Trenches	<input type="checkbox"/>	Protected Ecological and Cultural Resources
<input type="checkbox"/>	Bolting, Riveting, and Fitting	x	Fall Protection	<input type="checkbox"/>	Resource Conservation
<input type="checkbox"/>	Buried Items	x	First Aid and CPR	x	Respiratory Protection
x	Concrete Well Pads	x	Hearing Protection	x	Rigging
x	Cranes and Derricks	x	Ladders	<input type="checkbox"/>	Scaffolding
<input type="checkbox"/>	Demolition	<input type="checkbox"/>	Lead	<input type="checkbox"/>	Tunnels and Shafts
x	Drinking Water (Water Well Construction)	<input type="checkbox"/>	Management of Hazardous Materials and Hazardous Solid Wastes	<input type="checkbox"/>	Underground Construction
<input type="checkbox"/>	Electrical			<input type="checkbox"/>	Wastewater
<input type="checkbox"/>		<input type="checkbox"/>	Marine Work and Diving	x	Welding and Cutting

<input type="checkbox"/>	Emergency Response to Spills and Releases	<input type="checkbox"/>	Material and Personnel Hoists		
<input type="checkbox"/>	Other				

See **Appendix 2** for a statement regarding applicable certifications for Frontz Drilling, Inc. Contractor Competent Person Joe Henley.

Hazard Identification, Notification, and Correction Process

Each employee is the critical leader for preventing injuries, illnesses, and adverse environmental impacts, Achieving SH&E excellence requires a personal commitment. Therefore, each employee is authorized to stop work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the work stoppage to the other affected stakeholders and further evaluate the condition and adjust the work plan to resolve the safety, health, or environmental concern before restarting the work.

Each employee shall understand that he or she has the **authority** and the **responsibility** to stop work at any time when he or she notices an unplanned or unexpected issue that he or she believes will adversely affect the project’s safety, health, or environmental risk. This concept is consistent Parsons SH&E core value.

There is no circumstance where retribution may be directed toward an employee who conscientiously exercised his or her stop work authority.

When should work be stopped? Here are some examples.

- An unsafe act is observed.
- An unsafe condition is observed in the work area.
- An incident or near miss occurs in the work area.
- There is an emergency.
- Alarms sound.
- There is a change in the planned work conditions.
- There is a change in the planned personnel associated with the work.
- There is a change in the planned in scope of work.
- A change is needed in the work plan.
- One or more personnel associated with the work task appear to be confused or demonstrate that they do not understand one or more parts of the work plan.
- Someone believes that personnel, the environment, facilities, or equipment, is exposed to an unacceptable level of risk.

Unsafe, unhealthful, or environmentally damaging work conditions, practices, or procedures shall be corrected in a timely manner based on the severity of the risk posed.

Specific Hazard and Risk Control Measures

Activities shall be evaluated by workers and other subject matter experts to determine the appropriate hazard and risk controls that shall be implemented when performing the activity. In most cases, formal activity hazard analyses (AHAs) shall be communicated and used; however, some activities may require more sophisticated risk management schemes.

See **Appendix 3** for Job Safety Analyses previously developed for OU-1 site activities.

Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions

The risk mitigation 2-week look ahead form, below, will be used to plan integrated risk mitigation strategies at weekly progress meetings.

SH&E Risk Mitigation 2-week Look-ahead Form			
SH&E Plan for Week Ending:		Contractor:	
Project/ Location:		Meeting Date:	
Plan Prepared by:		Dated:	
Next Two Weeks' Scope of Work:			
Identified SH&E Risks/Exposures/Hazards Issues:			
Identify Tasks requiring environmental construction permitting (e.g., stormwater permit) or involving other environmental regulatory issues (e.g., generation of new, uncharacterized waste):			
Tasks with environmental risk of significant spills or releases:			
Control Measures:			
Additional Activity Hazards Analysis Required:			
Contractors and Subcontractors Mobilizing/Demobilizing:			
Audits/Inspections Scheduled:			
Competent Person Changes:			
Planned Orientation/Training:			
Recommendations/Comments/Concerns:			
Note: This information shall be incorporated into the meeting minutes.			

Employee Participation and Consultation

Open, two-way communication between the leadership team and line employees on SH&E issues is essential to an injury-free, productive, and environmentally sound workplace. The following system provides for the flow of SH&E information.

- Continually maintaining an environment where any worker can report SH&E concerns without any risk of retribution.
- A collaborative approach to resolving worker SH&E concerns, using worker knowledge and experience in developing appropriate risk control measures.
- New worker orientation, including specific orientation to SH&E policies and procedures
- Reviews of the SSHEP and the Parsons PSHEP
- Workplace SH&E training programs
- Regular SH&E meetings
- Posted or distributed SH&E information (awareness program)
- Procedures to anonymously inform SH&E management of workplace hazards, exposures, or risks
- An employee (or labor/management) SH&E committee that: 1) meets regularly and prepares written records, 2) reviews results of periodic scheduled inspections, 3) reviews incident investigations, 4) assesses work risk, 5) reviews reports of hazards, exposures, or adverse environmental conditions, and 6) makes suggestions to management to prevent future incidents.

Emergency Action Plan

Emergency Action planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Site-specific Medical Emergency Plan

Medical Emergency planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Incident Reporting, Investigation, and Corrective Action Processes

Incident reporting, investigation, and corrective action strategies for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Work Site Inspection and Program Audit Process

Site SH&E inspections shall be performed by one or more knowledgeable employees prior to beginning work each day in areas where work will take place during the shift. Designated competent persons shall perform frequent inspections and assessments of the areas and activities under their oversight throughout the day. Deficiencies shall be corrected as soon as possible.

The superintendent or project manager shall perform documented weekly SH&E inspections of all work sites. Deficiencies shall be tracked to closure in a timely manner.

The following SH&E inspections shall be performed. Findings shall be tracked to timely closure.

Competent Person / Inspector	Area of Responsibility	Frequency
Joe Henley	Drilling/ Site Safety	Daily
Jeff Burnside	Drill Crew	Daily
Kile Fisher	Drill Crew	Daily

The following compliance programs shall be reviewed and audited. Findings shall be tracked to timely closure.

Reviewer / Auditor	Compliance Program	Frequency

Progressive Disciplinary Program

Frontz Drilling, Inc. does not maintain a Progressive H&S Disciplinary Program.

Recordkeeping / Document Retention Processes

All records shall be maintained no less than 3 years beyond the end of the contracted work, unless a longer period of retention is required by a regulatory agency.

Frontz Drilling, Inc. SH&E document retention process for the site includes:

- Electronic retention of licensing, certification, and training records of Frontz Drilling's field staff;
- Retention of SDS's for materials stored or used in the course of routine Front Drilling's work;
- Review and retention of Health & Safety plans and employee training records provided by OU-1 subcontractors where applicable; and
- Retention of medical respirator approval forms and fit testing results for employees who participate in Frontz Drilling's Respiratory Protection Program.

Appendices

Appendix 1
(not applicable)

Appendix 2

Frontz Drilling's Contractor Competent Person, Joe Henley, is deemed competent in the aforementioned areas due to training and experience in these task areas. No formal certifications have been issued.

Appendix 3
Job Safety Analyses

Task Name Sonic Drilling

AHA Type: Investigation O&M Office Construction Other: New Revised **Date:** 2/2016

Developed By: Michele Twilley, DrPH, CIH **Reviewed By:**

Work Activity:

Personal Protective Equipment (PPE):

- | | | | | | | |
|---|--|---------------------------------------|---|--------------------------------------|--|--|
| <input checked="" type="checkbox"/> Hard Hat | <input checked="" type="checkbox"/> Safety Glasses | <input type="checkbox"/> Ear Muffs | <input type="checkbox"/> Long Pants/Sleeves | <input type="checkbox"/> Inner Glove | <input type="checkbox"/> Fall Protection | <input type="checkbox"/> Wide Brim Hat |
| <input checked="" type="checkbox"/> Leather Glove | <input type="checkbox"/> Safety Goggles | <input type="checkbox"/> Ear Plugs | <input type="checkbox"/> Coveralls (coated) | <input type="checkbox"/> Outer Glove | <input type="checkbox"/> Cooling Vest | <input type="checkbox"/> Half/Full Face Respirator |
| <input checked="" type="checkbox"/> Kevlar Glove | <input checked="" type="checkbox"/> Safety Toe Boots | <input type="checkbox"/> Traffic Vest | <input type="checkbox"/> Flame Resistant Clothing | <input type="checkbox"/> Face Shield | <input type="checkbox"/> Welding PPE | <input type="checkbox"/> Cartridge/Filter Type: |
- Other PPE: Leather gloves as needed for using small hand held tools.

Safety Equipment:

- | | | | | | | |
|---|--|---|---|---------------------------------------|---|---|
| <input checked="" type="checkbox"/> First Aid Kit | <input type="checkbox"/> Eyewash Station | <input type="checkbox"/> Eyewash Bottles | <input checked="" type="checkbox"/> Fire Extinguisher (A-B-C) | <input type="checkbox"/> Pop-up Shade | <input type="checkbox"/> Sunscreen | <input type="checkbox"/> Drinking Water |
| <input type="checkbox"/> Air Horn | <input type="checkbox"/> Trekking Poles | <input type="checkbox"/> Insect Repellent | <input checked="" type="checkbox"/> Wheel Chocks | <input type="checkbox"/> Cargo Net | <input type="checkbox"/> Stretch First Safety First | |
- Other Safety Equipment:

Frontz Drilling SH&E Standard Operating Procedures (SOP)s:

Risk Level Calculation - Select Risk Level for each job step, prior to controls

Severity	Likelihood	Severity					Risk Level (RL)			
1 Remote potential for injury, property damage/\$ loss, or env damage	1 Very unlikely	1	2	3	4	5	<table border="1"> <tr><td>Low (1-4)</td></tr> <tr><td>Medium (5-15)</td></tr> <tr><td>High (16-25)</td></tr> </table>	Low (1-4)	Medium (5-15)	High (16-25)
Low (1-4)										
Medium (5-15)										
High (16-25)										
2 Potential for minor first aid injury, property damage/\$ loss, or environmental damage	2 Unlikely	2	4	6	8	10				
3 Potential for moderate personnel injuries (medical treatment), property damage/\$ loss, environmental damage, or negative public impact	3 Likely	3	6	9	12	15				
4 Potential for a serious injury, major property damage/\$ loss, serious impact to the environment, and public health	4 Very likely	4	8	12	16	20				
5 Catastrophic damage to people, property/equipment, environment, or public health	5 Certain	5	10	15	20	25				

Principal Steps	Potential Hazards	Recommended Controls	RL
1. Drill rig setup with unloading and staging tools and equipment	<ul style="list-style-type: none"> Back strain, pulled muscles during unloading equipment Broken ankles, twisted knee due to slip/trip/falls getting in/out of vehicles and transporting equipment Broken hands/fingers and lacerations due to crush hazards unloading equipment Serious burns or death from shock/electrocution due to contact with overhead utilities/obstructions 	<ul style="list-style-type: none"> Safe lift: stretch, bend at knees, keep back straight, do not twist at waist. Hold items close to body. Items heavier than 50 lbs or items that are awkward to handle, use mechanical devices or ask for help. Continuously check ground for uneven and slippery terrain. <ul style="list-style-type: none"> Always maintain 3 points contact when climbing up/down equipment and maintain good housekeeping. Show Hands with hi-viz kevlar/all-purpose gloves. Position hands 6 inches away from pinch points on lift gate latches and utility boxes. Use provided handles/latches while opening/closing tool boxes. Ensure area is free of utilities and maintain minimum 10 foot distance from electric utilities below 50kv (over 50kv, add 4" for every 10kv). <ul style="list-style-type: none"> Ensure rig will not contact any overhead utilities/obstructions in event of rig tip over. Assistant shall monitor mast raising. 	4

	<ul style="list-style-type: none"> • Death or serious injury due to rig tipover by deploying outriggers on uneven ground/potential previous excavations • Personal injury to health from biologic hazards: snakes, bees / wasps, spiders, poisonous plants, or animals 	<ul style="list-style-type: none"> • Ensure rig is level prior to raising mast. Check area for history of excavations/trenches. Use donnage/cribbing to support outriggers. • Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, dropping etc). <ul style="list-style-type: none"> ○ Use a tool to move vegetation not your hand or foot. ○ Avoid all snakes regardless of ID as poisonous/ nonpoisonous. ○ If bitten or stung by insect and if victim is known to be allergic and in need of epinephrine pen (Epi-Pen) administered or not, call 410-918-6911. ○ If bitten by a spider such as brown recluse or black widow, Stop Work, contact PM, secure site, and bring victim to nearest hospital. ○ If poisonous plant is contacted, wash immediately with soap/water and monitor for unusual signs of allergic reaction such as abnormal swelling. ○ Wear cut resistant gloves, long sleeved shirt, insect repellent. 	
<p>2. Containment tub setup</p>	<ul style="list-style-type: none"> • Broken ankles, twisted knee due to slip/trip/falls setting up containment tub and hoses • Back strain/pulled muscles from moving/setting up containment tub • Broken hands/fingers and lacerations due to crushing/ struck by moving containment tub 	<ul style="list-style-type: none"> • Run all hoses from rig pump to containment tub and rig swivel to pump out of pathways and clearly mark with caution tape/cones. <ul style="list-style-type: none"> ○ Keep all tools, core sleeve rolls, casings off ground and out of pathways. ○ Keep ground surfaces free of liquids to avoid slips. • Use wire line hoist and assistance to put containment tub in place. • Position your body and body parts so you are never between tub and equipment. Show Hands 100% of time wearing hand PPE: kevlar/all-purpose gloves. 	<p>3</p>
<p>3. Begin drilling / sampling</p>	<ul style="list-style-type: none"> • Death or broken bones due to contact with rotating parts • Serious burns or death due to shock / electrocution from contact with underground utilities • Acute or chronic health issues such as cancer due to inhalation, ingestion, or absorption of contaminants • Hearing loss due to noise level >85 dB during operation • Death or disabling injuries due to heat illnesses such as heat stroke 	<ul style="list-style-type: none"> • Stay 3 feet away from moving rotating parts (i.e., casing, sample rods, drive shafts, etc.). <ul style="list-style-type: none"> ○ Prior to beginning drilling, ensure that all crew members know location of emergency stop switches and test each to ensure function. ○ Maintain at least 3 foot distance from borehole while drilling. ○ Use squeegee/shovels to remove soils. • Proceed slowly for first 12' to assess potential for contact with underground utilities. Unusual symptoms should be investigated. <ul style="list-style-type: none"> ○ Intrusive work shall stop if non-native material is encountered including pea gravel and crushed concrete. • Do not advance borehole without air monitoring being performed by client. Consult site specific HASP for PELs. <ul style="list-style-type: none"> ○ Do not splash bucket decon water/contents when cleaning tools. ○ Wear kevlar/rubber while handling soils and groundwater. • Wear hearing protection with required NRR so exposure is below 85 to 90 dBs <ul style="list-style-type: none"> ○ Any area within 20' of operating drill head/engine requires hearing protection. • Take breaks/fluids based upon work/rest regimen <ul style="list-style-type: none"> ○ Drink 8 ounces of water per 15 minutes when real feel meets/ exceeds 80°. ○ Wear loose clothing and carry additional shirt to switch out if it becomes saturated to prevent heat from being trapped. 	<p>4</p>
<p>4. Soil sample / core removal</p>	<ul style="list-style-type: none"> • Head injury due to struck by when tilting drill head to retrieve core • Back strain/muscle pull from overexertion handling samples 	<ul style="list-style-type: none"> • Driller shall communicate to all personnel starting tilting operation to avoid striking personnel. • Safe lift handling samples: bend at knees, keep back straight, do not twist at waist. Hold sample close to body. If sample becomes heavier than 50 lbs or becomes awkward (too loose) to handle, ask for help. • Make sure work area is clean, pick up all tools, soils, and refuse and maintain walk ways. 	<p>4</p>

	<ul style="list-style-type: none"> • Broken ankle/twisted knee due to slip/trip/falls from poor housekeeping • Broken ankle/twisted knee due to slip/trip/falls from debris/uneven surfaces • Acute or chronic illness due to soil contaminants absorption • Acute or chronic due to organic vapor inhalation • Nerve damage to hands due to barrel vibration 	<ul style="list-style-type: none"> • Sweep up area of loose debris prior to beginning work activity. <ul style="list-style-type: none"> ◦ Set traffic cones over areas that present tripping hazards. • Wear kevlar/rubber while handling soils and groundwater.. • Do not advance boring without air monitoring being performed by client. Consult site specific HASP for PELs. • Hands shall not make contact with core barrel while vibrating soil sample out of barrel. 	
<p>5. Cleanup and movement of rig</p>	<ul style="list-style-type: none"> • Visitor mishaps and resulting bodily injury. • Striking overhead lines or objects with drill mast. 	<ul style="list-style-type: none"> • Pay attention to visitors approaching work area. When necessary, setup traffic cones and/or other traffic barriers to keep vehicles and visitors out of the work area. Use caution tape if available. • Observe overhead lines, tree limbs, or other objects before lowering the mast of the drill rig. Anticipate the radius of sweep coming down, and plan appropriately. 	<p>4</p>
Inspection Requirements		Training and Qualification Requirements	
<p>Drilling equipment, containment tub, Hand tools</p>			
Chemical Exposure Hazards			
<p>COCs</p>			
Additional Safety Considerations			
<p>1. Safety glasses must be clear (not shaded/tinted)</p>			



TASK HAZARD ANALYSIS (THA)

ACKNOWLEDGEMENT

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- I will conduct work at this site in accordance with the requirements of the AHA.

By signing this form, subcontractors and visitors agree that:

- I have read and understood the potential hazards associated with the site.
- I will ensure compliance with my company's policies on health and safety.

Printed Name	Signed Name	Company	Date

Task Name Well Construction

AHA Type: Investigation O&M Office Construction Other: New Revised **Date:** 2/2016

Developed By: Michele Twilley, DrPH, CIH **Reviewed By:**

Work Activity:

Personal Protective Equipment (PPE):

- Hard Hat Safety Glasses Ear Muffs Long Pants/Sleeves Inner Glove Fall Protection Wide Brim Hat
 - Leather Glove Safety Goggles Ear Plugs Coveralls (coated) Outer Glove Cooling Vest Half/Full Face Respirator
 - Kevlar Glove Safety Toe Boots Traffic Vest Flame Resistant Clothing Face Shield Welding PPE Cartridge/Filter Type:
- Other PPE: Leather gloves as needed for using small hand held tools.

Safety Equipment:

- First Aid Kit Eyewash Station Eyewash Bottles Fire Extinguisher (A-B-C) Pop-up Shade Sunscreen Drinking Water
- Air Horn Trekking Poles Insect Repellent Wheel Chocks Cargo Net Stretch First Safety First

Other Safety Equipment:

Frontz Drilling SH&E Standard Operating Procedures (SOP)s:

Risk Level Calculation - Select Risk Level for each job step, prior to controls

Severity	Likelihood	Severity	Risk Level (RL)																									
1 Remote potential for injury, property damage/\$ loss, or env damage	1 Very unlikely	Likelihood	<table border="1" style="margin: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td></tr> <tr><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td></tr> <tr><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td></tr> <tr><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td></tr> </table>	1	2	3	4	5	2	4	6	8	10	3	6	9	12	15	4	8	12	16	20	5	10	15	20	25
1	2			3	4	5																						
2	4			6	8	10																						
3	6			9	12	15																						
4	8			12	16	20																						
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2 Potential for minor first aid injury, property damage/\$ loss, or environmental damage	2 Unlikely	Low (1-4)																										
3 Potential for moderate personnel injuries (medical treatment), property damage/\$ loss, environmental damage, or negative public impact	3 Likely	Medium (5-15)																										
4 Potential for a serious injury, major property damage/\$ loss, serious impact to the environment, and public health	4 Very likely	High (16-25)																										
5 Catastrophic damage to people, property/equipment, environment, or public health	5 Certain																											

Principal Steps	Potential Hazards	Recommended Controls	RL
<p>1. Staging of well construction materials</p>	<ul style="list-style-type: none"> Back strain, pulled muscles during unloading equipment Broken ankles, twisted knee due to slip/trip/falls getting in/out of vehicles and transporting equipment Broken hands/fingers and lacerations due to crush hazards unloading materials 	<ul style="list-style-type: none"> Safe lift: stretch, bend at knees, keep back straight, do not twist at waist. Hold items close to body. Items heavier than 50 lbs or items that are awkward to handle, use mechanical devices or ask for help. Continuously check ground for uneven and slippery terrain. <ul style="list-style-type: none"> Always maintain 3 points contact when climbing up/down equipment and maintain good housekeeping. Show Hands with hi-viz kevlar/all-purpose gloves. Position hands 6 inches away from pinch points on lift gate latches and utility boxes. Use provided handles/latches while opening/closing tool boxes. 	4

<p>2. Loosen binder straps holding well casing in rack in place on tender</p>	<ul style="list-style-type: none"> • Pinch point due between binder bar and truck while handling • Muscle strain or back pull due to overexertion pulling on binder bar • Twisted knee/ankle or broken bones due to fall when pulling on binder bar • Laceration/fractured skull pulling on binder bar 	<ul style="list-style-type: none"> • Use both hands in closed fist around bar to loosen binder wheel when pulling down to release tension. <ul style="list-style-type: none"> ○ Ensure pointed end of binder bar is fully inserted into hole on binder wheel prior to applying force. ○ Wear leather or Kevlar/all-purpose gloves. • Use both hands standing to one side (not directly underneath) of the bar while pulling down. • Ensure pointed end of binder bar is fully inserted into hole on binder wheel prior to applying force. <ul style="list-style-type: none"> ○ Inspect binder strap to identify any cuts/tears that may fully tear allowing strap to break during tensioning. • Ensure pointed end of binder bar is fully inserted into hole on binder wheel prior to applying force. <ul style="list-style-type: none"> ○ Wear hard hat. 	<p>4</p>
<p>3. Install hoist control</p>	<ul style="list-style-type: none"> • Broken fingers/lacerations due to pinching between plug and receptacle • Electrical shock from vehicle batter/electrical system when plugging in hoist control 	<ul style="list-style-type: none"> • Place hoist control on truck body and use one hand to control plug when inserting into receptacle. <ul style="list-style-type: none"> ○ Wear leather gloves. • Keep fingers clear of plug ends while inserting into electrical socket. 	<p>4</p>
<p>4. Lift crane hoist into place over casing rack</p>	<ul style="list-style-type: none"> • Injury from contact with crane hook/block 	<ul style="list-style-type: none"> • Never stand under suspended load: including empty hook/swage block, empty slings, etc. <ul style="list-style-type: none"> ○ Keep all unauthorized personnel minimum 10 feet from outer barrier of lift zone. ○ Wear hard hat. 	<p>4</p>
<p>5. Attach crane hoist hook to bridles affixed to casing rack shackles</p>	<ul style="list-style-type: none"> • Broken bones and serious lacerations due to falling from truck while climbing up/down • Broken fingers/lacerations due to pinching between bridle and crane hoist hook • Injury from contact with crane hook/block 	<ul style="list-style-type: none"> • Maintain 3 points of contact while climbing up and down. Keep hands free from any tooling/equipment. • Set hoist control down once hook is in position to prevent accidental activation of hoist while manual connections are being made between bridle shackles and crane hoist hook. <ul style="list-style-type: none"> ○ Show Hands Policy in effect during process of hook-up to bridles. ○ Keep fingers where you can see them and out from in between all objects including shackles, empty hook/swage block, empty slings, etc. ○ Wear leather gloves. • Always maintain visual and verbal contact with operator and do not operate crane hoist while personnel are in motion on truck to situate themselves by casing rack for hook-up. <ul style="list-style-type: none"> ○ Wear hard hat. 	<p>4</p>
<p>6. Lift casing rack off tender and position over boring</p>	<ul style="list-style-type: none"> • Broken bones and serious lacerations due to falling load, failed rigging components, broken wire rope, etc • Death, skull fracture, other serious bodily injuries from falling load when suspended 	<ul style="list-style-type: none"> • Perform "Practice Lift" by hoisting only ~3-5" from tender deck to ensure all components are functioning properly prior to completely removing from tender. After lift, set back down on tender for final inspection. <ul style="list-style-type: none"> ○ Inspect for binding, twisting of all connections and bridle components. ○ Inspect wire rope and spool/drum for any damage, flat spots, bird caging or unusual wear or fatigue. Any sign of wear/tear requires evaluation by a competent person before crane hoist can be used. ○ Damaged equipment shall be taken out of service immediately. • Maintain control of lift zone using barricades and prevent any unauthorized personnel from entering. <ul style="list-style-type: none"> ○ Do not stand under suspended load. ○ Wait for assistant to climb down from truck and confirm location of all site personnel. 	<p>4</p>

		<ul style="list-style-type: none"> ○ Assistant may use tag line to control casing rack as directed by crane hoist operator. ○ Wear hard hat. 	
7. Lowering of well screen and casing into boring and tightening joints	<ul style="list-style-type: none"> ● Broken bones and serious lacerations due to falling load, failed rigging components, broken wire rope, etc ● Pinch and over torque from pinch points and hand tools ● Broken ankle/twisted knee due to slip/trip/falls from debris/uneven surfaces ● Acute or chronic due to organic vapor inhalation 	<ul style="list-style-type: none"> ● Pay attention to casing as being lowered down into borehole; Keep hands free from any tooling when activity not in progress ● Workers should keep fingers away from pinch and shear points ● Make sure work area is clean, pick up all tools, soils, and refuse and maintain walk ways. ● Wear kevlar/rubber while handling casing and coming into contact with soils and groundwater.. ● Do not install without air monitoring being performed by client. Consult site specific HASP for PELs. 	3
8. Installing annular materials	<ul style="list-style-type: none"> ● Inhalation of silica sand, bentonite, or cement dust ● Eye injury or irritation from splashing ground water ● Physical hazards associated with use of hand tools to tighten or loosen drills ● Back, hand, or foot injuries during manual handling of materials 	<ul style="list-style-type: none"> ● Wear a well fitting disposable dust mask when pouring sand or bentonite, or mixing concrete, if necessary ● Wear goggles or a face shield when working directly over open boring with ground water near the surface. ● Maintain hand tools in proper working condition. Use the correct tool for the task. Avoid "knuckle-banging" (i.e., pay attention to direction of torqued tool slips). Wear hi-viz kevlar/leather gloves ● Wipe off greasy, wet, slippery, or dirty objects before attempting to handle them. 	4
9. Cleanup and movement of rig	<ul style="list-style-type: none"> ● Visitor mishaps and resulting bodily injury. ● Striking overhead lines or objects with drill mast. 	<ul style="list-style-type: none"> ● Pay attention to visitors approaching work area. When necessary, setup traffic cones and/or other traffic barriers to keep vehicles and visitors out of the work area. Use caution tape if available. ● Observe overhead lines, tree limbs, or other objects before lowering the mast of the drill rig. Anticipate the radius of sweep coming down, and plan appropriately. 	4
Inspection Requirements		Training and Qualification Requirements	
Drilling equipment, Hand tools			
Chemical Exposure Hazards			
COCs			
Additional Safety Considerations			
1. Safety glasses must be clear (not shaded/tinted)			

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By signing this form, subcontractors and visitors agree that:

- I have read and understood the potential hazards associated with the site.
- I will ensure compliance with my company's policies on health and safety.

Printed Name	Signed Name	Company	Date

Job Safety Analysis
Emergency contact information is located in the General HASP

Well Abandonment Activities		Date of Use: 8-26-2019
Development Team Member(s)	Position	
NAME OF HASP AUTHOR	Chad Frontz / Business Manager	
NAME OF DEVELOPMENT TEAM MEMBER	Stephen Wright / Env Services Manager	

Verification and Review of Hazard Mitigation Measures	Signature	Date
Requirements of this JSA have been verified and discussed with affected site workers		

Personal Protective Equipment (PPE)					
Hard Hat (ANSI Z89.1)	X	Hearing Protection	X	Gloves (High-Visibility When Possible)	X
Safety Glasses With Side Shields (ANSI Z87.1)	X	High-Visibility Clothing (Min. ANSI/ISEA 107 Class 2)	X	Safety-Toed Boots (ASTM-F2413 or ANSI Z41)	X
Knee Pads/Kneeling Pad	X				

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
1. General activities/ Verification process	<ul style="list-style-type: none"> Various hazards 	<ul style="list-style-type: none"> Follow requirements in the JSA for General work activities. All Job Steps completion requires verification. If only one staff is onsite the Field Manager must obtain verification by calling the Project Manager or Task Manager 		
2. Enter a HAZWOPER Exclusion Zone	<ul style="list-style-type: none"> Various incidents resulting from untrained workers 	<ul style="list-style-type: none"> Each employee must have received current HAZWOPER training, possess a valid HAZWOPER medical clearance, and have completed applicable training for this task. The Field Manager and Health and Safety Officer must have received 8-hr HAZWOPER supervisory training. Site-specific training must address the hazards, storage, and proper handling associated with all chemicals that will be used onsite. 		

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
<p>3. Drill rig setup with unloading and staging tools and equipment</p>	<ul style="list-style-type: none"> • Back strain, pulled muscles during unloading equipment • Broken ankles, twisted knee due to slip/trip/falls getting in/out of vehicles and transporting equipment • Broken hands/fingers and lacerations due to crush hazards unloading equipment • Serious burns or death from shock/electrocution due to contact with overhead utilities/obstructions • Death or serious injury due to rig tipover by deploying outriggers on uneven ground/potential previous excavations • Personal injury to health from biologic hazards: snakes, bees / wasps, spiders, poisonous plants, or animals 	<ul style="list-style-type: none"> • Safe lift: stretch, bend at knees, keep back straight, do not twist at waist. Hold items close to body. Items heavier than 50 lbs or items that are awkward to handle, use mechanical devices or ask for help. • Continuously check ground for uneven and slippery terrain. <ul style="list-style-type: none"> ○ Always maintain 3 points contact when climbing up/down equipment and maintain good housekeeping. • Show Hands with all-purpose gloves. Position hands 6 inches away from pinch points on lift gate latches and utility boxes. Use provided handles/latches while opening/closing toolboxes. • Ensure area is free of utilities and maintain minimum 10 foot distance from electric utilities below 50kv (over 50kv, add 4" for every 10kv). <ul style="list-style-type: none"> ○ Ensure rig will not contact any overhead utilities/obstructions in event of rig tip over. Assistant shall monitor mast raising. • Ensure rig is level prior to raising mast. Check area for history of excavations/trenches. Use donnage/cribbing to support outriggers. • Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, dropping etc). <ul style="list-style-type: none"> ○ Use a tool to move vegetation not your hand or foot. ○ Avoid all snakes regardless of ID as poisonous/ nonpoisonous. ○ If bitten or stung by insect and if victim is known to be allergic and in need of epinephrine pen (Epi-Pen) administered or not, call emergency services. ○ If bitten by a spider such as brown recluse or black widow, Stop Work, contact PM, secure site, and bring victim to nearest hospital. ○ If poisonous plant is contacted, wash immediately with soap/water and monitor for unusual signs of allergic reaction such as abnormal swelling. ○ Wear cut resistant gloves, long sleeved shirt, insect repellent. 		
<p>4. Well pad removal</p>	<ul style="list-style-type: none"> • Back strain, pulled muscles during unloading equipment • Flying debris from chop-saw or sledgehammer. 	<ul style="list-style-type: none"> • Safe lift: stretch, bend at knees, keep back straight, do not twist at waist. Hold items close to body. Items heavier than 50 lbs or items that are awkward to handle, use mechanical devices or ask for help. • Continuously check ground for uneven and slippery terrain. <ul style="list-style-type: none"> ○ Always maintain 3 points contact when climbing up/down equipment and maintain good housekeeping. • Use eye protection during all pad removal activities, and a face shield for any work done with a chop saw. • Use water to douse chop-saw blade while cutting to reduce flying debris and dust. 		

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
5. Begin overdrilling casing	<ul style="list-style-type: none"> • Death or broken bones due to contact with rotating parts • Serious burns or death due to shock / electrocution from contact with underground utilities • Acute or chronic health issues such as cancer due to inhalation, ingestion, or absorption of contaminants • Hearing loss due to noise level >85 dB during operation • Death or disabling injuries due to heat illnesses such as heat stroke 	<ul style="list-style-type: none"> • Stay 3 feet away from moving rotating parts (i.e., casing, drive shafts, etc.). <ul style="list-style-type: none"> ○ Prior to beginning drilling, ensure that all crew members know location of emergency stop switches and test each to ensure function. ○ Maintain at least 3-foot distance from borehole while drilling. ○ Use squeegee/shovels to remove soils. • Proceed slowly for first 12' to assess potential for contact with underground utilities. Unusual symptoms should be investigated. <ul style="list-style-type: none"> ○ Intrusive work shall stop if non-native material is encountered including pea gravel and crushed concrete. • Do not splash bucket decon water/contents when cleaning tools. • Wear rubber gloves while handling soils and groundwater. • Wear hearing protection with required NRR so exposure is below 85 to 90 dBs <ul style="list-style-type: none"> ○ Any area within 20' of operating drill head/engine requires hearing protection. • Take breaks/fluids based upon work/rest regimen <ul style="list-style-type: none"> ○ Wear loose clothing and carry additional shirt to switch out if it becomes saturated to prevent heat from being trapped. 		
6. Casing removal and handling	<ul style="list-style-type: none"> • Head injury due to struck by when tilting drill head to retrieve core • Back strain/muscle pull from overexertion handling casing • Broken ankle/twisted knee due to slip/trip/falls from poor housekeeping • Broken ankle/twisted knee due to slip/trip/falls from debris/uneven surfaces • Acute or chronic illness due to soil contaminants absorption • Cuts, lacerations, or strains when handling materials. 	<ul style="list-style-type: none"> • Driller shall communicate to all personnel starting tilting operation to avoid striking personnel. • Safe lift handling casing: bend at knees, keep back straight, do not twist at waist. Hold casing close to body. If casing becomes heavier than 50 lbs or becomes awkward (too loose) to handle, ask for help. • Make sure work area is clean, pick up all tools, soils, and refuse and maintain walk ways. • Sweep up area of loose debris prior to beginning work activity. • Wear rubber gloves while handling casing, soils and groundwater. • Preferable methods of PVC cutting include specialized drill bits that cut PVC from the inside. If a hand saw or other hand tool is used, remove soil from around casing for proper management of the saw. • Do not attempt to break PVC casing at joints, or remove sections of casing below normal abandonment depth to prevent soil bridging. 		

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/Validation (Print Name)
7. Installing annular materials / plugging well	<ul style="list-style-type: none"> • Inhalation of silica sand, bentonite, or cement dust • Eye injury or irritation from splashing ground water • Physical hazards associated with use of hand tools to tighten or loosen drills • Back, hand, or foot injuries during manual handling of materials • Burns from contact with grout during mixing/lifting. • Pressure under grout funnel 	<ul style="list-style-type: none"> • Wear a well-fitting disposable dust mask when pouring sand or bentonite, or mixing concrete, if necessary • Wear goggles or a face shield when working directly over open boring with ground water near the surface. • Maintain hand tools in proper working condition. Use the correct tool for the task. Avoid "knuckle-banging" (i.e., pay attention to direction of torqued tool slips). Wear leather gloves • Wipe off greasy, wet, slippery, or dirty objects before attempting to handle them. • Mix grout on lower settings for powered mixing technique to minimize grout splashes. • Mix grout over plastic sheeting to minimize cleanup or staining of property • Use drills or other powered mixing methods to mitigate muscle strains associated with manual grout mixing. • Use wheelbarrows, carts, or (if possible) a vehicle to move sealed containers of pre-mixed grout to abandonment locations. <ul style="list-style-type: none"> ○ Ensure grout funnel does not plug the well opening. With several pounds of grout feeding into the well, any water above the well screen can be forced upward and outward onto the abandonment crew. 		
8. Opening new drums	<ul style="list-style-type: none"> • Broken hands/fingers from pinch points on drum lid rings • Broken/twisted ankle due to unsecured materials 	<ul style="list-style-type: none"> • Keep hands/fingers where they can be seen. Wear all-purpose gloves. • Secure drum lid and ring after removing from drum to prevent rolling. 		
9. Filling drums	<ul style="list-style-type: none"> • Back and arm muscle/joint strain from shoveling or bucketing materials into drums • Adverse health issues due to inhalation, ingestion, or absorption of contaminants 	<ul style="list-style-type: none"> • Whether placing materials in by hand or by tool, always use safe body positioning such as: <ul style="list-style-type: none"> ○ Use trained shoveling techniques: bend at knees, keep back straight, pivot on one foot, do not twist at waist, do not fully extend shovel away from body when loaded with soils. ○ Place body as close as possible to load, lift with your knees. • Do not fill drum with solid material beyond 75%. • Wear PPE: all-purpose gloves when dry and rubber gloves when wet, safety glasses. • Do not stage drums on unlevel surfaces that would allow run-off of materials toward storm drains/dry wells due to inclement weather. <ul style="list-style-type: none"> ○ Leave 12" minimum between drums allowing shovels to fit between drums for clean up of spilled soils/drilling fluids. ○ Stage drums periodically to prevent buildup of drums to prevent clean up from becoming overwhelming. 		
10. Moving drums	<ul style="list-style-type: none"> • Broken hands/fingers from pinch points on drum lid rings 	<ul style="list-style-type: none"> • Use wrench or ratchet/socket of proper size on bolt and hammer ring into place to ensure full closure. • Wear PPE: all-purpose gloves when dry and rubber gloves when wet, safety glasses. 		

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/Validation (Print Name)
11. Use of low pressure steam cleaner to perform decon (if necessary)	<ul style="list-style-type: none"> • Adverse health issues due to exposure from splash/contact of site contaminants • Burns to skin from hot surfaces • Bruises/other skin injuries from high pressure spray • Adverse health issues to others due to exposure from splash/contact of site contaminants that migrated outside decon area • Hearing damage due to noise level >85 dB 	<ul style="list-style-type: none"> • Review and understand action levels noted in HASP. • Wear PPE: rubber gloves to prevent hand injuries, safety glasses w/face shield, rain gear or laminated tyvek, long pants, sleeved shirt, steel toe boots and over boots, if necessary. • Inspect body of steam cleaner/pump system and hoses prior to use to ensure all connections are secure and guards are in place. • Do not touch/handle bare pipe on steam cleaner wand, hose or associated piping; may cause skin burns on contact. • Do not reach into any opening in unit while operating; ensure guards are in place on external moving parts prior to start-up. <ul style="list-style-type: none"> ○ All hoses and fittings shall be inspected prior to use. ○ Defective equipment shall be repaired or replaced prior to use. ○ Do not sit on or touch pressure washer during operation. ○ Thermal protective gloves shall be worn if there is a need to contact hot machinery parts. • Do not hold equipment being cleaned. Always work so steam and high-pressure spray is directed away from body/body parts. • Reduce pressure of steam cleaner to prevent excessive spray. <ul style="list-style-type: none"> ○ Consider building back and side walls of decon pad as necessary to contain splash. • Wear hearing protection: ear plugs and/or muffs within 20 feet of operation. 		
12. Cleanup and movement of rig and other equipment	<ul style="list-style-type: none"> • Visitor mishaps and resulting bodily injury. • Striking overhead lines or objects with drill mast. 	<ul style="list-style-type: none"> • Pay attention to visitors approaching work area. When necessary, setup traffic cones and/or other traffic barriers to keep vehicles and visitors out of the work area. Use caution tape if available. • Observe overhead lines, tree limbs, or other objects before lowering the mast of the drill rig. Anticipate the radius of sweep coming down, and plan appropriately. 		

APPENDIX B—Safety Data Sheets

SDSs will be maintained onsite for each of the following chemicals:

- Asphalt patch
- Bentonite
- Concrete
- Liquinox
- Silica Sand

Appendix 4

West Lake Landfill Emergency Response

Plan: current version included in main PSHEP

Information Required in an SSHEP

Section	Title	Section	Title
1	Project Owner, Project Name, and Contractor’s Safety, Health, and Environmental Policy Statement	11	Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions
2	Scope of Work Evaluation	12	Employee Participation and Consultation
3	Responsibility and Identification of Key Personnel	13	Emergency Action Plan
4	Overall Assessment of SH&E Hazards, Exposures, and Risks	14	Site-specific Medical Emergency Plan
5	Relevant SH&E Compliance Programs, Associated Compliance Information, and Personnel Responsibility Assignments	15	Incident Reporting, Investigation, and Corrective Action Processes
6	SH&E Compliance Training Matrix and Training / Education Processes	16	Work Site Inspection and Program Audit Processes
7	Site-specific Worker Orientation Program	17	Progressive Disciplinary Program
8	Identification of Competent / Qualified Personnel	18	Recordkeeping / Document Retention Processes
9	Hazard Identification, Notification, and Correction Process	19	Other (as defined by Contractor or Parsons)
10	Specific Hazard and Risk Control Measures (e.g., Activity Hazard Analyses, Operational Risk Management Processes)	20	Other (as defined by Contractor or Parsons)

Date: <u>6/12/2020</u>			Project/Location: <u>West Lake Landfill OU-1 Design Investigation</u>		
Contractor Name: <u>Dirty Dog Drilling, Inc</u>			Parsons SH&E Representative: _____		
<p>The information provided here is based on a review of the contractor site-specific safety, health, and environmental plan (SSHEP). Areas identified as incomplete shall be revised based on the standards in the contract specifications and the project safety, health, and environmental plan (PSHEP). Contractors shall resubmit revised sections of the SSHEP to the project manager within 1 week of receiving this review documentation.</p>					
Section	Complete	Incomplete	Section	Complete	Incomplete
Statement of SH&E Policy	<input type="checkbox"/>	<input type="checkbox"/>	Specific Activity Hazard Analyses (AHAs) and Operational Risk Assessments	<input type="checkbox"/>	<input type="checkbox"/>
Scope of Work Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	Adequate Hazard / Risk Controls	<input type="checkbox"/>	<input type="checkbox"/>
Key Line Personnel Identified	<input type="checkbox"/>	<input type="checkbox"/>	2-Week Look-ahead Planning	<input type="checkbox"/>	<input type="checkbox"/>
Overall Assessment of Hazards and Risks	<input type="checkbox"/>	<input type="checkbox"/>	Employee Participation and Consultation	<input type="checkbox"/>	<input type="checkbox"/>
Relevant SH&E Compliance Programs (Hazard Communication, PPE, HAZWOPER, Hazardous Energy Control, Fall Protection, Confined Space Entry, RCRA, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Action Plan	<input type="checkbox"/>	<input type="checkbox"/>
SH&E Compliance Program Responsibilities Assigned	<input type="checkbox"/>	<input type="checkbox"/>	Site-specific Medical Emergency Plan	<input type="checkbox"/>	<input type="checkbox"/>
Compliance Training and Education Programs	<input type="checkbox"/>	<input type="checkbox"/>	Incident Reporting, Investigation, and Corrective Action Processes	<input type="checkbox"/>	<input type="checkbox"/>
Site-specific Worker Orientation Program	<input type="checkbox"/>	<input type="checkbox"/>	Work Site Inspection and Program Audit Processes	<input type="checkbox"/>	<input type="checkbox"/>
Competent and Qualified Personnel Identified	<input type="checkbox"/>	<input type="checkbox"/>	Progressive Disciplinary Program	<input type="checkbox"/>	<input type="checkbox"/>
Hazard Identification, Notification, and Correction Process	<input type="checkbox"/>	<input type="checkbox"/>	Recordkeeping / Document Retention Processes	<input type="checkbox"/>	<input type="checkbox"/>
Additional Comments / Other SSHEP Sections or Information Required					

Reviewed by:					
Name			Title		
_____			_____		

*Dirty Dog Drilling, Inc. dba Bulldog Drilling
West Lake Landfill OU-1 Design Investigation*

Contractor Site-specific Safety, Health, and
Environmental Plan **(SSHEP)**

June 2020

Table of Contents

Contractor's Safety, Health, and Environmental Policy Statement	5
Scope of Work Evaluation	6
Responsibilities and Identification of Key Personnel.....	7
Overall Assessment of SH&E Hazards, Exposures, and Risks	8
SH&E Compliance Programs	9
SH&E Compliance Training Matrix and Training / Education Processes.....	10
Site-specific Worker Orientation Program.....	11
Identification of Competent / Qualified Persons	12
Hazard Identification, Notification, and Correction Process.....	13
Specific Hazard and Risk Control Measures	14
Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions.....	15
Employee Participation and Consultation	16
Emergency Action Plan	17
Site-specific Medical Emergency Plan	18
Incident Reporting, Investigation, and Corrective Action Processes	19
Work Site Inspection and Program Audit Process.....	20
Progressive Disciplinary Program.....	21
Recordkeeping / Document Retention Processes	22
Appendices.....	23

Contractor's Safety, Health, and Environmental Policy Statement

This plan contains the minimum requirements for an effective contractor site-specific safety, health, and environmental Plan (SSHEP) by Dirty Dog Drilling, Inc. dba Bulldog Drilling for the West Lake Landfill OU-1 Design Investigation. This SSHEP shall be implemented and maintained by Dirty Dog Drilling, Inc. dba Bulldog Drilling. This SSHEP applies to all persons of our company.

The leadership team is responsible for ensuring that all SH&E policies and procedures are clearly communicated and understood by all employees. Managers and supervisors are expected to enforce the rules fairly and uniformly.

All employees are responsible for using safe work practices, following all directives, policies and procedures, and assisting in maintaining a safe work environment.

Our system of ensuring that all workers comply with the rules and maintain a safe work environment includes the following.

- Informing workers of the provisions of this SSHEP
- Evaluating the SH&E performance of all workers
- Recognizing employees who consistently perform SH&E work practices very well
- Providing training to workers whose SH&E performance is deficient
- Disciplining workers for failure to comply with safe, healthful, and environmentally responsible work practices

Scope of Work Evaluation

Field tasks to be performed by Dirty Dog Drilling, Inc. dba Bulldog Drilling during the West Lake Landfill OU-1 Design Investigation will include the following:

Task 1 – Advance continuously sampled boreholes using a drill rig equipped with hollow stem augers and standard penetration test (SPT) equipment

Task 2 – Record SPT data, i.e. blow counts, and decontaminate split spoons (between samples) and augers (between boreholes) in accordance with the project Field Sampling Plan

Task 3 – Install temporary casing fitted with a bottom slip cap through the auger string (to facilitate downhole radiological scanning by others) and subsequently remove the augers from the borehole, securing the casing to counteract buoyancy where applicable

Task 4 – Plug boreholes in accordance with state regulations, and procure variances where applicable

Task 5 – Provide assistance to project personnel during drilling/sampling, decontamination, borehole plugging, sample handling, and radiological survey/scanning activities as needed

Responsibilities and Identification of Key Personnel

These personnel have authority and responsibility to implement this program.

Contractor:	Dirty Dog Drilling, Inc. dba Bulldog Drilling	
Address:	411 Transpoint Drive Dupo IL 62239	
Telephone	Fax	Email
n/a	n/a	n/a
Company Executive responsible for project		Contact No.
Jennifer Scharringhausen		Direct Line: 618-286-3800 Cell Phone: 618-558-3582 Email: jennifers@bulldogdrilling.com
Manager/Superintendent:		Contact No.
Robert Scharringhausen		Direct Line: 618-286-3800 Cell Phone: 618-910-3025 Email: roberts@bulldogdrilling.com
Safety Representative/Manager:		Contact No.
Robert Scharringhausen		Direct Line: 618-286-3800 Cell Phone: 618-910-3025 Email: roberts@bulldogdrilling.com
Key Foreperson or Forepersons:		Contact No.
John Gates		Direct Line: 618-286-3800 Cell Phone: 314-620-8723 Email: roberts@bulldogdrilling.com
Client Project Management Point of Contact:		Contact No.
Robert Scharringhausen		Direct Line: 618-286-3800 Cell Phone: 618-910-3025 Email: roberts@bulldogdrilling.com

All managers and supervisors are responsible for implementing and maintaining the SSHEP in their work areas and for answering worker questions about the SSHEP. Managers and supervisors shall make a copy of this SSHEP available to all workers.

Overall Assessment of SH&E Hazards, Exposures, and Risks

Task	Potential Hazards	Mitigation/Response Actions
Drilling/sampling	<ul style="list-style-type: none"> - Traversing uneven terrain - Radiological exposure inside Areas 1 / 2 from excavated materials and open boreholes - Vehicular traffic at locations near roads - Noise - Heavy equipment - Muscle strain - Pinch points - Rotating equipment/pinch points - Falling objects 	<ul style="list-style-type: none"> - Be alert to surroundings - Follow RWP and/or site PPE reqs - Hi-vis outerwear, traffic control equip - Use hearing protection - Be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Watch moving parts, overhead activity - Keep hands away from moving parts
Decontamination activities	<ul style="list-style-type: none"> - Splashing liquids - Muscle strain - Slips, trips, falls 	<ul style="list-style-type: none"> - Splash shields, spray control/avoidance - Use safe lifting technique/ergonomics - Watch footing, use slip-resistant equip
Temporary casing installation	<ul style="list-style-type: none"> - Heavy equipment - Muscle strain - Radiological exposure - Falling objects 	<ul style="list-style-type: none"> - Be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Follow RWP and/or site PPE requirements
Borehole plugging	<ul style="list-style-type: none"> - Heavy equipment - Muscle strain - Falling objects - Radiological exposure - Corrosive materials 	<ul style="list-style-type: none"> - Be alert to operators' limited visibility - Use safe lifting technique/ergonomics - Watch moving parts - Follow RWP and/or site PPE requirements - Stand upwind or use dust masks - Wash grout off of skin

Activities shall be evaluated and activity hazards analyses (AHAs) or other effective risk management process shall be developed. A Health and Safety Plan for Dirty Dog Drilling, Inc. dba Bulldog Drilling is included in **Appendix 3** of this SSHEP.

SH&E Compliance Programs

Dirty Dog Drilling, Inc. dba Bulldog Drilling shall comply with relevant SH&E laws and regulations. Written compliance programs shall be implemented on our job sites and coordinated with other site contractors, our lower-tier subcontractors, and with Parsons, as appropriate. Our employees shall be aware of these programs, receive adequate training, and perform their work consistent with these compliance programs where applicable. Programs include but are not limited to:

- 40-Hr Hazardous Waste Operations & Emergency Response certification (HAZWOPER) in accordance with 29 CFR 1910.120 (administered by others)
- 8-Hr HAZWOPER Refresher certification within the preceding 12 months in accordance with 29 CFR 1910.120(e) and (p) (administered by others)
- Bridgeton Landfill Contractor Safety Orientation certification within the preceding 12 months (administered by Matt Stewart-Environmental Manager, Bridgeton Landfill 314-656-2130)
- Radiation Safety certification (Rad Worker, etc.) in general accordance with recommendations for instructional training described in Federal Register 52:17 p. 2832 (administered by others)
- A valid, unrestricted Well Installer's Permit issued by the Missouri Department of Natural Resources-Division of Geology and Land Survey (administered by MDNR-DGLS 573-368-2165)

SH&E Compliance Training Matrix and Training / Education Processes

All workers, including managers and supervisors, shall receive competent and relevant site-specific SH&E training. This training shall include site-specific SH&E compliance training and general site training on SH&E best practices. Our employees shall be properly prepared for conducting their work and shall comply with the relevant SH&E programs and general site-specific SH&E practices.

A written training matrix shall be established and maintained that identifies the workers (by name or by title/role), all of the SH&E-related training they must have, and the frequency for refresher (if needed).

Training shall be provided:

- When the SSHEP is established;
- To all new workers;
- To all workers with new job assignments for which training has not been previously provided;
- When new substances, processes, procedures, or equipment are introduced to the workplace and represent a new hazard, potential exposure, or risk;
- When the employer is made aware of a new or previously unrecognized hazard, exposure, or risk;
- To familiarize supervisors with the SH&E hazards, exposures, or risk to which workers under their immediate direction and control may be exposed; and
- To all workers for hazards, exposures, or risks specific to their job assignment and in compliance with related SH&E compliance programs.

Workplace safety and health practices for all work locations shall include, at a minimum:

- An explanation of the SSHEP, the Parsons Project Safety, Health, and Environmental Plan (PSHEP), the site’s emergency action plan and fire prevention plan, and the measures to report unsafe conditions, work practices, injuries, and/or a recognized need for additional instruction;
- The general purpose, availability, use, limitations, and disposal of outerwear and personal protective equipment;
- Locations of sanitation, hand-washing, and drinking water facilities;
- Provisions for medical services and first aid, including emergency procedures;
- Response procedures for environmental spills or releases; and
- Specific instructions to workers on hazards unique to their job assignment to the extent such information is not covered in other training.

License/Certification	Employee
OSHA HAZWOPER 40-hr + 8-Hr Refresher	R. Scharringhausen, J. Gates, C. Dutton, J. Edwards, S. Guy, C. Robinson, C. Maxeiner
Missouri Well Installer’s Permit	J. Gates, C. Dutton, J. Edwards, J. Scharringhausen, C. Maxeiner

Radiation Safety Training	R. Scharringhausen, J. Gates, C. Dutton, J. Edwards, S. Guy, C. Robinson, C. Maxeiner
Bridgeton LF Annual H&S	R. Scharringhausen, J. Gates, C. Dutton, J. Edwards, S. Guy, C. Robinson, C. Maxeiner

Site-specific Worker Orientation Program

All new workers on our jobsite shall receive site-specific orientation training before conducting their work. This training shall consist of SH&E compliance training and general site SH&E practices related to their work.

Employees completing orientation shall acknowledge in writing completing and understanding the site-specific orientation subject matter. Employees who do not understand one or more subjects shall be retrained.

Site orientation training is provided by Matt Stewart-Environmental Manager, Bridgeton Landfill.

Identification of Competent / Qualified Persons

Contractor Competent Person Certification (United States)

Definition					
A competent person is a formally-designated person having the ability to recognize existing and predictable hazards and has the authority to correct them.					
Responsibility					
The designated contractor competent person is responsible for recognizing and correcting SH&E risks/hazards. This person has the authority to stop work due to a perceived SH&E concern on the jobsite. This contractor manager and designated competent person are considered field contacts for Parsons projects.					
This form shall be completed by each contractor manager and the contractor-designated competent person. Where a contractor is responsible for multiple crafts, it will be necessary to maintain additional designated competent persons and forms. Each contractor on a Parsons project shall submit this completed form to the Parsons project manager before beginning work on the project and must update it any time the designated competent person changes.					
Acknowledgment					
I, <u>Jennifer Scharringhausen</u> representing, <u>Dirty Dog Drilling, Inc. dba Bulldog Drilling</u>					
Contractor Manager (Printed)		Contractor Company Name (Printed)			
have assigned <u>John Gates</u> to be the competent person in the areas indicated and					
Contractor Competent Person (Printed)					
I acknowledge that this individual has been thoroughly trained, is experienced in hazard recognition, and has the authority to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.					
<u>Jennifer Scharringhausen</u>		<u>6/24/2020</u>			
Contractor Manager (Signature)		Date			
I acknowledge that I have been thoroughly trained and have the experience to perform the duties as the competent person in the areas marked below, and I understand that I have the responsibility and authority to correct hazards and to stop work in the event of a potential hazardous or imminent danger situation.					
<u>John Gates</u>		<u>6/24/2020</u>			
Contractor Competent Person (Signature)		Date			
(Check the areas in which the designated competent person is permitted to execute the role of Contractor Competent Person.)					
<input type="checkbox"/>	Air Pollution and Emissions	<input type="checkbox"/>	Environmental Assessments	<input type="checkbox"/>	Mechanical Demolition
<input type="checkbox"/>	Asbestos	<input type="checkbox"/>	Excavations and Trenches	<input type="checkbox"/>	Protected Ecological and Cultural Resources
<input type="checkbox"/>	Bolting, Riveting, and Fitting	<input type="checkbox"/>	Fall Protection	<input type="checkbox"/>	Resource Conservation
<input type="checkbox"/>	Buried Items	<input checked="" type="checkbox"/>	First Aid and CPR	<input type="checkbox"/>	Respiratory Protection
<input type="checkbox"/>	Concrete, Forms, and Shoring	<input type="checkbox"/>	Hearing Protection	<input type="checkbox"/>	Rigging
<input type="checkbox"/>	Cranes and Derricks	<input type="checkbox"/>	Ladders	<input type="checkbox"/>	Scaffolding
<input type="checkbox"/>	Demolition	<input type="checkbox"/>	Lead	<input type="checkbox"/>	Tunnels and Shafts
<input type="checkbox"/>	Drinking Water	<input type="checkbox"/>	Management of Hazardous Materials and Hazardous Solid Wastes	<input type="checkbox"/>	Underground Construction
<input type="checkbox"/>	Electrical			<input type="checkbox"/>	Wastewater
<input type="checkbox"/>	Emergency Response to Spills and Releases	<input type="checkbox"/>	Marine Work and Diving	<input type="checkbox"/>	Welding and Cutting
<input type="checkbox"/>		<input type="checkbox"/>	Material and Personnel Hoists		

<input type="checkbox"/>	Other
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Applicable certifications for Bulldog Drilling Contractor Competent Person John Gates are attached as **Appendix 2**.

Hazard Identification, Notification, and Correction Process

Each employee is the critical leader for preventing injuries, illnesses, and adverse environmental impacts, Achieving SH&E excellence requires a personal commitment. Therefore, each employee is authorized to stop work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the work stoppage to the other affected stakeholders and further evaluate the condition and adjust the work plan to resolve the safety, health, or environmental concern before restarting the work.

Each employee shall understand that he or she has the **authority** and the **responsibility** to stop work at any time when he or she notices an unplanned or unexpected issue that he or she believes will adversely affect the project's safety, health, or environmental risk. This concept is consistent Parsons SH&E core value.

There is no circumstance where retribution may be directed toward an employee who conscientiously exercised his or her stop work authority.

When should work be stopped? Here are some examples.

- An unsafe act is observed.
- An unsafe condition is observed in the work area.
- An incident or near miss occurs in the work area.
- There is an emergency.
- Alarms sound.
- There is a change in the planned work conditions.
- There is a change in the planned personnel associated with the work.
- There is a change in the planned in scope of work.
- A change is needed in the work plan.
- One or more personnel associated with the work task appear to be confused or demonstrate that they do not understand one or more parts of the work plan.
- Someone believes that personnel, the environment, facilities, or equipment, is exposed to an unacceptable level of risk.

Unsafe, unhealthful, or environmentally damaging work conditions, practices, or procedures shall be corrected in a timely manner based on the severity of the risk posed.

Specific Hazard and Risk Control Measures

Activities shall be evaluated by workers and other subject matter experts to determine the appropriate hazard and risk controls that shall be implemented when performing the activity. In most cases, formal activity hazard analyses (AHAs) shall be communicated and used; however, some activities may require more sophisticated risk management schemes.

See **Appendix 3** for Dirty Dog Drilling, Inc. dba Bulldog Drilling's Health and Safety Plan for OU-1 site activities.

Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions

The risk mitigation 2-week look ahead form, below, will be used to plan integrated risk mitigation strategies at weekly progress meetings.

SH&E Risk Mitigation 2-week Look-ahead Form			
SH&E Plan for Week Ending:		Contractor:	
Project/ Location:		Meeting Date:	
Plan Prepared by:		Dated:	
Next Two Weeks' Scope of Work:			
Identified SH&E Risks/Exposures/Hazards Issues:			
Identify Tasks requiring environmental construction permitting (e.g., stormwater permit) or involving other environmental regulatory issues (e.g., generation of new, uncharacterized waste):			
Tasks with environmental risk of significant spills or releases:			
Control Measures:			
Additional Activity Hazards Analysis Required:			
Contractors and Subcontractors Mobilizing/Demobilizing:			
Audits/Inspections Scheduled:			
Competent Person Changes:			
Planned Orientation/Training:			
Recommendations/Comments/Concerns:			
Note: This information shall be incorporated into the meeting minutes.			

Employee Participation and Consultation

Open, two-way communication between the leadership team and line employees on SH&E issues is essential to an injury-free, productive, and environmentally sound workplace. The following system provides for the flow of SH&E information.

- Continually maintaining an environment where any worker can report SH&E concerns without any risk of retribution.
- A collaborative approach to resolving worker SH&E concerns, using worker knowledge and experience in developing appropriate risk control measures.
- New worker orientation, including specific orientation to SH&E policies and procedures
- Reviews of the SSHEP and the Parsons PSHEP
- Workplace SH&E training programs
- Regular SH&E meetings
- Posted or distributed SH&E information (awareness program)
- Procedures to anonymously inform SH&E management of workplace hazards, exposures, or risks
- An employee (or labor/management) SH&E committee that: 1) meets regularly and prepares written records, 2) reviews results of periodic scheduled inspections, 3) reviews incident investigations, 4) assesses work risk, 5) reviews reports of hazards, exposures, or adverse environmental conditions, and 6) makes suggestions to management to prevent future incidents.

Emergency Action Plan

Emergency Action planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Site-specific Medical Emergency Plan

Medical Emergency planning and response actions for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Incident Reporting, Investigation, and Corrective Action Processes

Incident reporting, investigation, and corrective action strategies for the site are described in West Lake Landfill's Emergency Response Plan (**Appendix 4**) and Site Management Plan (**Appendix 5**), and in Bridgeton Landfill's Incident Management Plan (**Appendix 6**).

Work Site Inspection and Program Audit Process

Site SH&E inspections shall be performed by one or more knowledgeable employees prior to beginning work each day in areas where work will take place during the shift. Designated competent persons shall perform frequent inspections and assessments of the areas and activities under their oversight throughout the day. Deficiencies shall be corrected as soon as possible.

The superintendent or project manager shall perform documented weekly SH&E inspections of all work sites. Deficiencies shall be tracked to closure in a timely manner.

The following SH&E inspections shall be performed. Findings shall be tracked to timely closure.

Competent Person / Inspector	Area of Responsibility	Frequency
Robert Scharringhausen	Tailgate Health & Safety Meetings	Daily
John Gates	Tailgate Health & Safety Meetings	Daily
John Gates	Work Site H&S inspections	Daily

The following compliance programs shall be reviewed and audited. Findings shall be tracked to timely closure.

Reviewer / Auditor	Compliance Program	Frequency

Progressive Disciplinary Program

Dirty Dog Drilling Inc. dba Bulldog Drilling does not maintain a Progressive H&S Disciplinary Program.

Recordkeeping / Document Retention Processes

All records shall be maintained no less than 3 years beyond the end of the contracted work, unless a longer period of retention is required by a regulatory agency.

Dirty Dog Drilling Inc. dba Bulldog Drilling SH&E document retention process for the site includes:

- Electronic retention of licensing, certification, and training records of Bulldog Drilling's field staff;
- Retention of SDS's for materials stored or used in the course of routine Bulldog Drilling work;
- Review and retention of Health & Safety plans and employee training records provided by OU-1 subcontractors where applicable; and
- Retention of medical respirator approval forms and fit testing results for employees who participate in Bulldog Drilling's Respiratory Protection Program.

Appendices

Appendix 1
(not applicable)

Appendix 2

Bulldog Drilling Contractor Competent Person Certifications

HEARTSAVER

**Heartsaver®
First Aid CPR AED**



John Gates

The above individual has successfully completed the cognitive and skills evaluations in accordance with the curriculum of the American Heart Association Heartsaver First Aid CPR AED Program.

Optional modules completed:

Exam, Child CPR AED, Infant CPR

Issue Date	Recommended Renewal Date
2/4/2019	02/2021

To view or verify authenticity, students and employers should scan this QR code with their mobile device or go to www.heart.org/cpr/mycards.



HEARTSAVER

Training Center Name SSM Health Care St. Louis

Training Center ID MO00236

TC Address 1173 Corporate Lake Drive
St. Louis MO USA

TC Phone 314-989-2424

Instructor Name Jenny Johnson

Instructor ID 11102134524

© 2016 American Heart Association 15-3002 3/16

Directions

1. Cut along dotted lines
2. Fold both halves together
3. Use adhesive to combine halves

Appendix 3
Health and Safety Plan



**Dirty Dog Drilling, Inc
d/b/a
Bulldog Drilling
411 Transpoint Drive
Dupo, IL 62239**

**BULLDOG DRILLING
HEALTH AND SAFETY PLAN**

**2020-3211
West Lake Landfill
OU-1 Design Investigation**

1.0 PURPOSE

The purpose of this Health and Safety Plan (HASP) is to assign responsibilities, establish personnel protection standards and mandatory safety practices and procedures, and provide for contingencies that may arise during site operations. This Plan must be read prior to going into the field to ensure proper planning (e.g., availability of equipment, etc.) and applicable Bulldog Drilling (BD) employee must sign the "Plan Acceptance Form".

Worker Training Records are not required on site. These records are on file in the BD Dupou, Illinois office.

Site safety meetings will be conducted prior to each shift by the Site Safety Officer (SSO) and documented using the "Job Safety Analysis" (JSA) form.

2.0 HASP DEVELOPMENT and APPROVAL

Project Name and Number: West Lake Landfill – OU-1 Design Investigation 2020-3211

Project Site Location: 13570 St. Charles Rock Rd., Bridgeton, Missouri 63044

BD Project Manager (PM): Robert Scharringhausen

BD Site Safety Officer (SSO): John Gates

Preparation Date: 6/13/2020

APPROVED:

Bulldog Drilling Project Manager

(Signature and Date)

3.0 FIELD PERSONNEL

The field team will consist of the following persons:

Rig Operator: John Gates, Robert Scharringhausen, or Josh Edwards

Rig Helper: Shawn Guy, or Chris Robinson

4.0 PROJECT DESCRIPTION

4.1 LOCATION

The site is located at: 13570 St. Charles Rock Rd., Bridgeton, Missouri 63044

See Attachment 1, Site Location Map.

4.2 SITE FEATURES

The following site features are present:

- Landfill

4.3 DESCRIPTION OF SITE WORK

Specifically, BD will perform the following tasks:

- Travel
- Hollow Stem Augering
- SPT Sampling
- Temporary Casing Installation
- Borehole Plugging
- Decontamination
- Safety Monitored

4.4 UTILITY One-Call

Utility clearance will be performed prior to any soil penetration activities. The BD state One-Call notification form shall be completed prior to soil penetration activities (Attachment 2). The work area will be inspected to verify no possibility of contact with overhead utilities. A buffer zone of at least 20 feet from overhead utilities must be maintained.

5.0 HAZARD EVALUATION

A daily Job Safety Analysis (JSA) will be performed by the BD crew.

In general, fieldwork will be conducted during daylight hours only. At least two personnel will be in the field at all times. The BD Project Manager must grant special permission for any field activities conducted beyond daylight hours.

5.1 CONTAMINANT TYPE(S) POTENTIALLY ENCOUNTERED

Liquid: X Solid: X Sludge: Gas: X

The individual soil and/or groundwater contaminants found in previous investigation are listed below:

- Waste
- Leachate
- Radiological

5.2 ROUTES OF EXPOSURE

Inhalation X Skin/Eye Contact X

Ingestion X

Skin Absorption X

5.3 EXPOSURE MONITORING

Exposure monitoring X will be required for this project. Instrumentation required for this monitoring is as follows:

<u> </u>	Explosimeter
<u> </u>	Oxygen Meter
<u> </u>	Hydrogen Sulfide Meter
<u> </u>	Photo ionization Detector (PID)
<u> </u>	Detector Tube
<u> X </u>	Geiger Counter and Radiation Dosimeter

5.4 INITIAL LEVEL OF PROTECTION

This project will be conducted using the following initial level of protection:

Level A Level B Level C Level D X

Level of Protection

Protective Equipment Ensemble

Coveralls or work clothes

- Impermeable coveralls required when in contact with waste materials:
 - **Tyvek**
 - **Over boots**

Work gloves (as needed)

- Impermeable gloves and inner gloves required when in contact with waste materials:
 - **PVC** (inner)
 - **Nitrile** (outer)

Safety boots, leather, steel toe

Safety glasses

- **Splash goggles** required for fluid pumping or grouting tasks

Hardhat

Hearing protection (when in proximity to heavy equipment or other noise generating sources)

Reflective safety vest

5.5 HAZARDS ANALYSIS FOR SITE TASKS (to be considered)

- Chemical Hazards
- Fire and Explosion Hazards
- Physical Hazards
- Biological Hazards
- Electrical Hazards
- Heat Stress
- Noise Hazards
- Permits
- Other Hazards - Radiation

5.6 HAZARD COMMUNICATION

The following chemicals will be used on site for this project. Material Safety Data Sheets (MSDSs) are attached to this plan. (Attachment 3)

Alconox	<u> X </u>
Bentonite (HS)	<u> X </u>
Sand	<u> </u>

6.0 EMERGENCY INFORMATION

6.1 EMERGENCY CONTACTS

Contact	Person or Agency	Telephone No.
Police	911	911
Fire	911	911
Ambulance	911	911
Hospital	SSM DePaul Hospital 12303 De Paul Dr, Bridgeton, MO 63044	(314) 344-6000
BD Project Manager	Robert Scharringhausen	(618) 910-3025

6.2 LOCATION OF HOSPITAL/CLINIC

A Hospital Location Map is attached as Attachment 4.

HEALTH & SAFETY PLAN ACCEPTANCE FORM

INSTRUCTIONS: This form is to be completed by each BD employee to work on the subject project work site.

Project Name: West Lake Landfill – OU-1 Design Investigation

Project Number: 2020-3211

Date: 6/12/2020

I represent that I have read and understand the contents of the above Plan and agree to perform my work in accordance with it. I furthermore acknowledge that I have been made aware of OSHA Hazard Communication Requirements for this project and Department of Labor Postings.

Signed

Print Name

Date

Signed

Print Name

Date

Signed

Print Name

Date

Attachment 1

Site Location Map

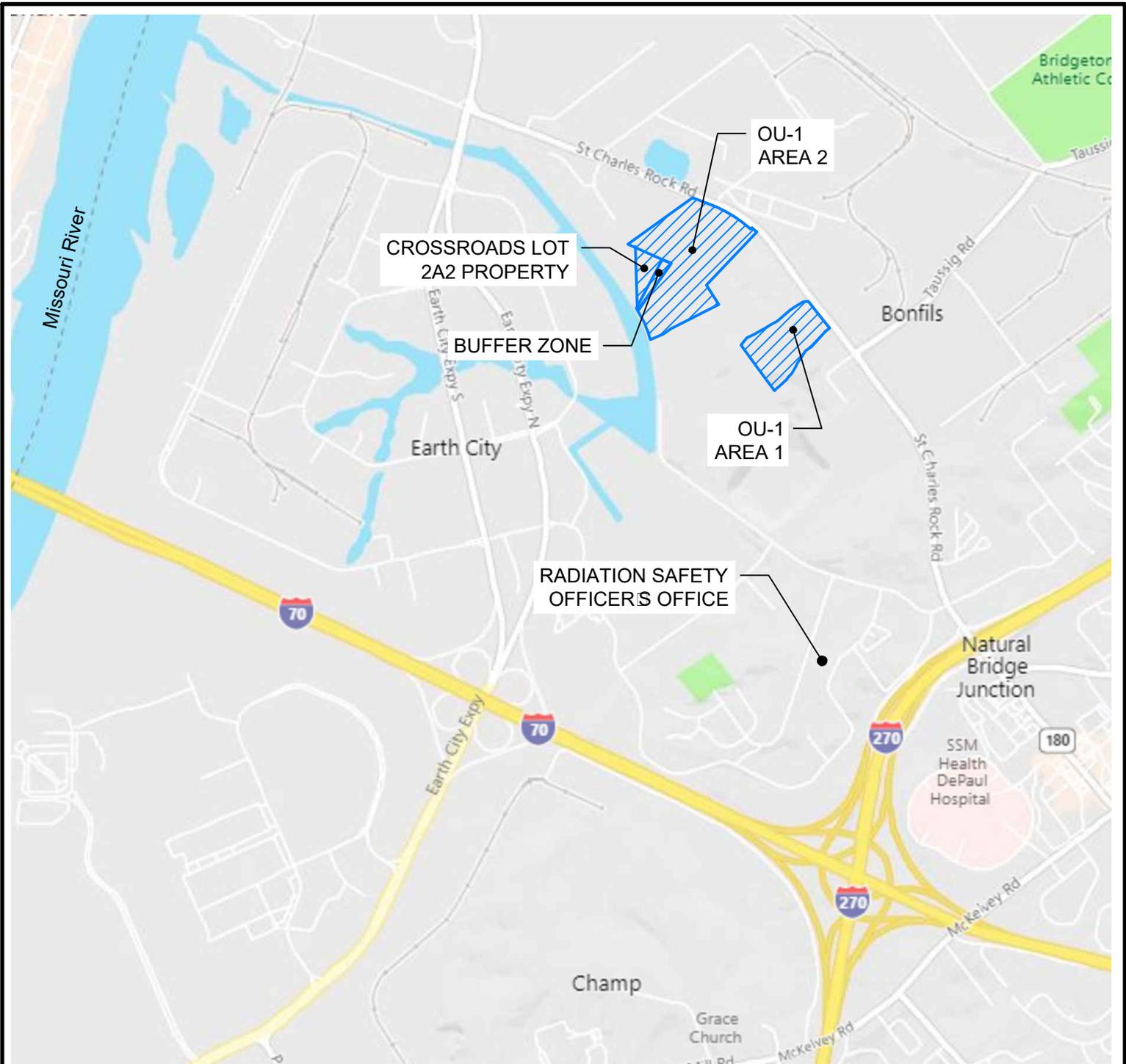
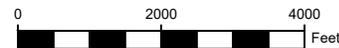


Image: © 2019 HERE, Open Street Map



NOTE:

- 1.) BASED ON FIGURES ORIGINALLY PREPARED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. AND PRESENTED IN THE MARCH 28, 2019 INCIDENT MANAGEMENT PLAN

PREPARED BY



PROJECT

WEST LAKE LANDFILL
SITE MANAGEMENT PLAN
BRIDGETON, MISSOURI 63044

MAY 2019

DESIGNED BY: IN

APPROVED BY: ---

FIGURE 1

DRAWING TITLE

SITE LOCATION

Attachment 2

"One-Call Notification"



The following is the information necessary to complete your locate request.

It is essential that all contact information is correct and current in order to receive utility response.

Caller Information

Name and Telephone number _____

Excavator Information

Excavator Name _____

Office Phone Number _____

Recording Device _____

Mailing Address: _____

Email Address: _____

Fax Number _____

Onsite Contact Information

First & Last Name: _____ Cell Number _____

Excavation Information

Type of Work: _____

Type of Equipment: _____

Work Done For: _____

Trenchless Excavation or Explosives _____

Is the Dig Site Marked With White Flags or Paint _____

Depth (in FT) _____

Location Information

County and City _____

Entire Job is Within City Limits _____

Address or Street Work is On or Along: _____

Nearest Intersecting Street _____

Second Intersecting Street _____

Location of Work: _____

Start Date and Time _____

Attachment 3

SDS's
(formerly MSDS's)

Effective date: 11 May 2020
Trade Name: Alconox®

Revision: 11 May 2020

I Identification of the substance/mixture and of the supplier

I.1 GHS Product identifier

Trade Name: Alconox®

Product number: 1101, 1103, 1104, 1104-1, 1112, 1112-1, 1125, 1150

I.2 Application of the substance / the mixture: Cleaning material/Detergent

I.2.1 Recommended dilution ratio: 1 – 2% in water

I.3 Details of the supplier of the Safety Data Sheet

Manufacturer:

Alconox Inc.
30 Glenn St
White Plains, NY 10603
(914) 948-4040

Supplier:

Emergency telephone number:

ChemTel Inc

North America: 1-888-255-3924

International: +1 813-248-0573

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272, 29CFR1910/1200 and GHS requirements.

Hazard-determining components of labeling:

Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate

2.2 Label elements:

Eye damage, category 1.

Skin irritation, category 2.

Product at recommended dilution:

Eye irritation, category 2B

Hazard pictograms:



Signal word: Danger

Hazard statements:

H315 Causes skin irritation.

H318 Causes serious eye damage.

Precautionary statements:

P264 Wash skin thoroughly after handling.

Effective date: 11 May 2020

Revision: 11 May 2020

Trade Name: Alconox®

P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P302+P352 If on skin: Wash with soap and water.
 P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
 P321 Specific treatment (see supplemental first aid instructions on this label).
 P332+P313 If skin irritation occurs: Get medical advice/attention.
 P362 Take off contaminated clothing and wash before reuse.
 P501 Dispose of contents and container as instructed in Section 13.

Hazardous Elements at Use Dilution:

Hazard Pictograms:

**Signal Word:** Warning**Hazard Statements:**

H320 Causes eye irritation

Precautionary statements:

P302+P352 If on skin: Wash with soap and water.
 P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
 P501 Dispose of contents and container as instructed in Section 13

Additional information: None.**Hazard description**

Hazards Not Otherwise Classified (HNOC): May cause surfaces to become slippery if wet. Use caution in areas of foot traffic if on floors.

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272, 29CFR1910/1200 and GHS Requirements, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists and is supplemented by information from technical literature and by information provided by the company.

3 Composition/information on ingredients

3.1 Chemical characterization: Not determined or not available.

3.2 Description: None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Skin Irrit. 2; H315 Eye Irrit. 2; H319	12-28
CAS number: 68081-81-2 or 68411-30-3	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2; H315 Eye Dam. 1; H318	8-22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Skin Irrit. 2; H315 Eye Irrit. 2; H319	2-16

Effective date: 11 May 2020
Trade Name: Alconox®

Revision: 11 May 2020

Hazardous components at use dilution (percentages by weight):

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Eye Irrit. 2; H319	0.12 - 0.28
CAS number: 68081-81-2 or 68411-30-3	Sodium Alkylbenzene Sulfonate	Eye Irrit. 2; H319	0.08 – 0.22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Eye Irrit. 2; H319	0.02 – 0.16

3.4 Additional Information: None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

Seek medical attention if irritation, discomfort, or vomiting persists.

4.2 Most important symptoms and effects, both acute and delayed

None

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

No additional information.

First aid measure at recommended dilution:

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

After swallowing:

Rinse mouth thoroughly. Seek medical attention if irritation, discomfort, or vomiting develops.

5 Firefighting measures

Effective date: 11 May 2020
Trade Name: Alconox®

Revision: 11 May 2020

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents: None

5.2 Special hazards arising from the substance or mixture:

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.
Refer to Section 8.

5.4 Additional information:

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.
Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation.
Ensure air handling systems are operational.

6.2 Environmental precautions:

Should not be released into the environment.
Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up:

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections: None

7 Handling and storage

7.1 Precautions for safe handling:

No expected hazards under normal use condition.
Avoid breathing mist or vapor if aerosolized.
Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities:

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Effective date: 11 May 2020
Trade Name: Alconox®

Revision: 11 May 2020

8 Exposure controls/personal protection



8.1 Control parameters:

- a) 7722-88-5, Tetrasodium Pyrophosphate, ACGIH TWA 10 mg/m3
- b) 7758-29-4, Sodium Tripolyphosphate, ACGIH TWA 10 mg/m3
- c) Dusts, non-specific OEL, Irish Code of Practice
 - (i) Total inhalable 10 mg/m3 (8hr)
 - (ii) Respirable 4 mg/m3 (8hr)
 - (iii) Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3, (8hr)

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal use conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection. Recommended to comply with ANSI Z87.1 and/or EN 166.

General hygienic measures:

Wash hands before breaks and at the end of work.
Avoid contact with skin, eyes and clothing.

Exposure Control and Personal Protective Equipment at recommended dilution:

Under normal use and operational conditions, no special personal protective equipment or engineering controls will be necessary. Handle with care.

9 Physical and chemical properties

Appearance (physical state, color):	White and cream colored flakes - powder	Explosion limit lower: Explosion limit upper:	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	Vapor pressure at 20°C:	Not determined or not available.
Odor threshold:	Not determined or not available.	Vapor density:	Not determined or not available.
pH-value:	9.5 (1% aqueous solution)	Relative density:	Not determined or not available.

Effective date: 11 May 2020
Trade Name: Alconox®

Revision: 11 May 2020

Melting/Freezing point:	Not determined or not available.	Solubilities:	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	Partition coefficient (n-octanol/water):	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	Auto/Self-ignition temperature:	Not determined or not available.
Evaporation rate:	Not determined or not available.	Decomposition temperature:	Not determined or not available.
Flammability (solid, gaseous):	Not determined or not available.	Viscosity:	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	Not determined or not available.		

10 Stability and reactivity

- 10.1 Reactivity:** Not determined or not available.
10.2 Chemical stability: Not determined or not available.
10.3 Possibility hazardous reactions: Not determined or not available.
10.4 Conditions to avoid: Not determined or not available.
10.5 Incompatible materials: Not determined or not available.
10.6 Hazardous decomposition products: Not determined or not available.

11 Toxicological information

11.1 Information on toxicological effects:

Acute Toxicity:

Oral:

: LD50 > 5000 mg/kg oral rat - Product.

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Sodium Alkylbenzene Sulfonate: Causes skin irritation.

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye damage.

Tetrasodium Pyrophosphate: Risk of serious damage to eyes.

Product information at recommended dilution:

Eye irritation may occur upon direct contact with eyes. No specific hazards for skin contact, inhalation, or chronic exposure are expected within normal use parameters.

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

Effective date: 11 May 2020
 Trade Name: Alconox®

Revision: 11 May 2020

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

12.1 Toxicity:

- Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
- Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.9 mg/l, 48 hours.
- Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
- Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.
- Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

- PBT:** No additional information.
- vPvB:** No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1 UN Number: ADR, ADN, DOT, IMDG, IATA	None														
14.2 UN Proper shipping name: ADR, ADN, DOT, IMDG, IATA	None														
14.3 Transport hazard classes: ADR, ADN, DOT, IMDG, IATA	<table> <tr> <td>Class:</td> <td>None</td> </tr> <tr> <td>Label:</td> <td>None</td> </tr> <tr> <td>LTD. QTY:</td> <td>None</td> </tr> </table>	Class:	None	Label:	None	LTD. QTY:	None								
Class:	None														
Label:	None														
LTD. QTY:	None														
<hr/> <table> <tr> <td>US DOT Limited Quantity Exception:</td> <td>None</td> </tr> <tr> <td>Bulk:</td> <td>Non Bulk:</td> </tr> <tr> <td>RQ (if applicable): None</td> <td>RQ (if applicable): None</td> </tr> <tr> <td>Proper shipping Name: None</td> <td>Proper shipping Name: None</td> </tr> <tr> <td>Hazard Class: None</td> <td>Hazard Class: None</td> </tr> <tr> <td>Packing Group: None</td> <td>Packing Group: None</td> </tr> <tr> <td>Marine Pollutant (if applicable): No additional information.</td> <td>Marine Pollutant (if applicable): No additional information.</td> </tr> </table>		US DOT Limited Quantity Exception:	None	Bulk:	Non Bulk:	RQ (if applicable): None	RQ (if applicable): None	Proper shipping Name: None	Proper shipping Name: None	Hazard Class: None	Hazard Class: None	Packing Group: None	Packing Group: None	Marine Pollutant (if applicable): No additional information.	Marine Pollutant (if applicable): No additional information.
US DOT Limited Quantity Exception:	None														
Bulk:	Non Bulk:														
RQ (if applicable): None	RQ (if applicable): None														
Proper shipping Name: None	Proper shipping Name: None														
Hazard Class: None	Hazard Class: None														
Packing Group: None	Packing Group: None														
Marine Pollutant (if applicable): No additional information.	Marine Pollutant (if applicable): No additional information.														

Effective date: 11 May 2020
 Trade Name: Alconox®

Revision: 11 May 2020

Comments: None	Comments: None
I4.4 Packing group: ADR, ADN, DOT, IMDG, IATA	None
I4.5 Environmental hazards:	None
I4.6 Special precautions for user: Danger code (Kemler): EMS number: Segregation groups:	None None None None
I4.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.	
I4.8 Transport/Additional information: Transport category: Tunnel restriction code: UN "Model Regulation":	
	None None None

I5 Regulatory information

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

North American

SARA Section 313 (specific toxic chemical listings): None of the ingredients are listed. Section 302 (extremely hazardous substances): None of the ingredients are listed.
CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable Spill Quantity: None of the ingredients are listed.
TSCA (Toxic Substances Control Act): Inventory: All ingredients are listed as active. Rules and Orders: Not applicable.
Proposition 65 (California): Chemicals known to cause cancer: None of the ingredients are listed. Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed. Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed. Chemicals known to cause developmental toxicity: None of the ingredients are listed.

Canadian Canadian Domestic Substances List (DSL): All ingredients are listed.

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Effective date: 11 May 2020
Trade Name: Alconox®

Revision: 11 May 2020

Germany MAK: Not classified.

EC 648/2004 – This is an industrial detergent. Contains >30% phosphate, 15-30% anionic surfactant, <5% EDTA salts

EC 551/2009 – This is not a laundry or dishwasher detergent

EC 907/2006 – Contains no enzymes, optical brighteners, perfumes, allergenic fragrances, or preservative agents

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.
H318 Causes serious eye damage.

NFPA: 1-0-0

HMIS: 1-0-0

At recommended dilution:

NFPA: 1-0-0

HMIS: 1-0-0

Precautionary statements:

P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET

Product Trade Name: BENTONITE

Revision Date: 28-Jan-2020

Revision Number: 51

1. Identification

1.1. Product Identifier

Product Trade Name: BENTONITE
Synonyms: None
Chemical Family: Mineral
Internal ID Code: HM000126

1.2 Recommended use and restrictions on use

Application: Weight Additive
Uses advised against: No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier

Halliburton Energy Services, Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Telephone: 1-281-871-6107

Halliburton Group Canada
645 - 7th Ave SW Suite 1800
Calgary, AB, T2P 4G8, Canada
Telephone: 1-403-231-9300

Prepared By

Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:

Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962 (accessible 24 hours a day / 7 days a week)
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

Carcinogenicity	Category 1A - H350
Specific Target Organ Toxicity - (Repeated Exposure)	Category 1 - H372

2.2. Label Elements

Hazard Pictograms



Signal Word:	Danger
Hazard Statements	H350 - May cause cancer H372 - Causes damage to organs through prolonged or repeated exposure
Precautionary Statements	
Prevention	P201 - Obtain special instructions before use P202 - Do not handle until all safety precautions have been read and understood P260 - Do not breathe dust/fume/gas/mist/vapors/spray P264 - Wash face, hands and any exposed skin thoroughly after handling P270 - Do not eat, drink or smoke when using this product P280 - Wear protective gloves/protective clothing/eye protection/face protection
Response	P308 + P313 - IF exposed or concerned: Get medical advice/attention P314 - Get medical attention/advice if you feel unwell
Storage	P405 - Store locked up
Disposal	P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

2.3 Hazards not otherwise classified

None known

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Crystalline silica, quartz	14808-60-7	1 - 5%	Carc. 1A (H350) STOT RE 1 (H372)

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Ingestion	Rinse mouth with water many times. Get medical attention, if symptoms occur

4.2 Most important symptoms/effects, acute and delayed

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

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

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

All standard fire fighting media

Extinguishing media which must not be used for safety reasons

None known.

5.2 Specific hazards arising from the substance or mixture

Special exposure hazards in a fire

None anticipated

5.3 Special protective equipment and precautions for fire-fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing.

Ensure adequate ventilation.

See Section 8 for additional information.

6.2. Environmental precautions

None known.

6.3. Methods and material for containment and cleaning up

Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. Handling and storage

7.1. Precautions for safe handling

Handling Precautions

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information

Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Crystalline silica, quartz	14808-60-7	TWA: 50 µg/m ³	TWA: 0.025 mg/m ³

8.2 Appropriate engineering controls

Engineering Controls Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Dust/mist respirator. (N95, P2/P3)

Hand Protection Use gloves which are suitable for the chemicals present in this product as well as other environmental factors in the workplace.

Skin Protection Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

Eye Protection Wear safety glasses or goggles to protect against exposure.

Other Precautions None known.

9. Physical and Chemical Properties**9.1. Information on basic physical and chemical properties**

Physical State: Solid	Color	Various
Odor: Odorless	Odor	No information available
	Threshold:	

<u>Property</u>	<u>Values</u>
<u>Remarks/ - Method</u>	
pH:	9.9
Freezing Point / Range	No data available
Melting Point / Range	No data available
Pour Point / Range	No data available
Boiling Point / Range	No data available
Flash Point	No data available
Flammability (solid, gas)	No data available
Upper flammability limit	No data available
Lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	2.65
Water Solubility	Insoluble in water
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%)	No data available
------------------------	-------------------

10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

None anticipated

10.5. Incompatible materials

Hydrofluoric acid.

10.6. Hazardous decomposition products

Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).

11. Toxicological Information

11.1 Information on likely routes of exposure

Principle Route of Exposure Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

Acute Toxicity

Inhalation

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

Eye Contact

May cause mechanical irritation to eye.

Skin Contact

None known.

Ingestion

May act as obstruction if swallowed.

Chronic Effects/Carcinogenicity

This product contains a suspected carcinogen. May cause damage to organs through prolonged or repeated exposure. Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

11.3 Toxicity data

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Crystalline silica, quartz	14808-60-7	> 15000 mg/kg (human)	No data available	No data available

Substances	CAS Number	Skin corrosion/irritation
Crystalline silica, quartz	14808-60-7	Non-irritating to the skin

Substances	CAS Number	Serious eye damage/irritation
Crystalline silica, quartz	14808-60-7	Non-irritating to the eye No information available
Substances	CAS Number	Skin Sensitization
Crystalline silica, quartz	14808-60-7	No information available.
Substances	CAS Number	Respiratory Sensitization
Crystalline silica, quartz	14808-60-7	No information available
Substances	CAS Number	Mutagenic Effects
Crystalline silica, quartz	14808-60-7	Not regarded as mutagenic.
Substances	CAS Number	Carcinogenic Effects
Crystalline silica, quartz	14808-60-7	Contains crystalline silica which may cause silicosis, a delayed and progressive lung disease. The IARC and NTP have determined there is sufficient evidence in humans of the carcinogenicity of crystalline silica with repeated respiratory exposure.
Substances	CAS Number	Reproductive toxicity
Crystalline silica, quartz	14808-60-7	No information available
Substances	CAS Number	STOT - single exposure
Crystalline silica, quartz	14808-60-7	No significant toxicity observed in animal studies at concentration requiring classification.
Substances	CAS Number	STOT - repeated exposure
Crystalline silica, quartz	14808-60-7	Causes damage to organs through prolonged or repeated exposure if inhaled: (Lungs)
Substances	CAS Number	Aspiration hazard
Crystalline silica, quartz	14808-60-7	Not applicable

12. Ecological Information

12.1. Toxicity

Ecotoxicity effects

Product is not classified as hazardous to the environment.

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Crystalline silica, quartz	14808-60-7	EC50(72 h)=440 mg/L (Pseudokirchneriella subcapitata)	LL0(96 h)=10000 mg/L (Danio rerio)	No information available	LL50(24 h)>10000 mg/L (Daphnia magna)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Crystalline silica, quartz	14808-60-7	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
Crystalline silica, quartz	14808-60-7	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Crystalline silica, quartz	14808-60-7	No information available

12.5 Other adverse effects

No information available

13. Disposal Considerations

13.1. Waste treatment methods

Disposal methods Follow all applicable community, national or regional regulations regarding waste management methods.

Contaminated Packaging Follow all applicable national or local regulations. Contaminated packaging may be disposed of by: rendering packaging incapable of containing any substance, or treating packaging to remove residual contents, or treating packaging to make sure the residual contents are no longer hazardous, or by disposing of packaging into commercial waste collection.

14. Transport Information

US DOT

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

Canadian TDG

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IMDG/IMO

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IATA/ICAO

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

Special Precautions for User None

15. Regulatory Information

US Regulations

US TSCA Inventory All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2

Substances	CAS Number	TSCA Significant New Use	TSCA Section 5(E) Consent
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		Rules - S5A2	Orders
Crystalline silica, quartz	14808-60-7	Not applicable	Not applicable

EPA SARA Title III Extremely Hazardous Substances

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Crystalline silica, quartz	14808-60-7	Not applicable

EPA SARA (311,312) Hazard Class

Specific target organ toxicity (single or repeated exposure)

Carcinogenicity

EPA SARA (313) Chemicals

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Crystalline silica, quartz	14808-60-7	Not applicable	Not applicable

EPA CERCLA/Superfund Reportable Spill Quantity

Substances	CAS Number	CERCLA RQ
Crystalline silica, quartz	14808-60-7	Not applicable

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65

Substances	CAS Number	California Proposition 65
Crystalline silica, quartz	14808-60-7	carcinogen

U.S. State Right-to-Know Regulations

Substances	CAS Number	MA Right-to-Know Law	NJ Right-to-Know Law	PA Right-to-Know Law
Crystalline silica, quartz	14808-60-7	Carcinogen Extraordinarily hazardous	Present	Present

NFPA Ratings:

Health 0, Flammability 0, Reactivity 0

HMIS Ratings:

Health 0*, Flammability 0, Physical Hazard 0, PPE: E

Canadian Regulations

Canadian Domestic Substances All components listed on inventory or are exempt.
List (DSL)

16. Other information**Preparation Information****Prepared By**

Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date:

28-Jan-2020

Reason for Revision

Initial Release

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet

bw – body weight

CAS – Chemical Abstracts Service

d - day

EC50 – Effective Concentration 50%

ErC50 – Effective Concentration growth rate 50%

h - hour

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL50 – Lethal Loading 50%

mg/kg – milligram/kilogram

mg/L – milligram/liter

mg/m³ - milligram/cubic meter

mm - millimeter

mmHg - millimeter mercury

NIOSH – National Institute for Occupational Safety and Health

NTP – National Toxicology Program

OEL – Occupational Exposure Limit

PEL – Permissible Exposure Limit

ppm – parts per million

STEL – Short Term Exposure Limit

TWA – Time-Weighted Average

UN – United Nations

w/w - weight/weight

Key literature references and sources for data

www.ChemADVISOR.com/

NZ CCID

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet

Attachment 4

Hospital Location Map

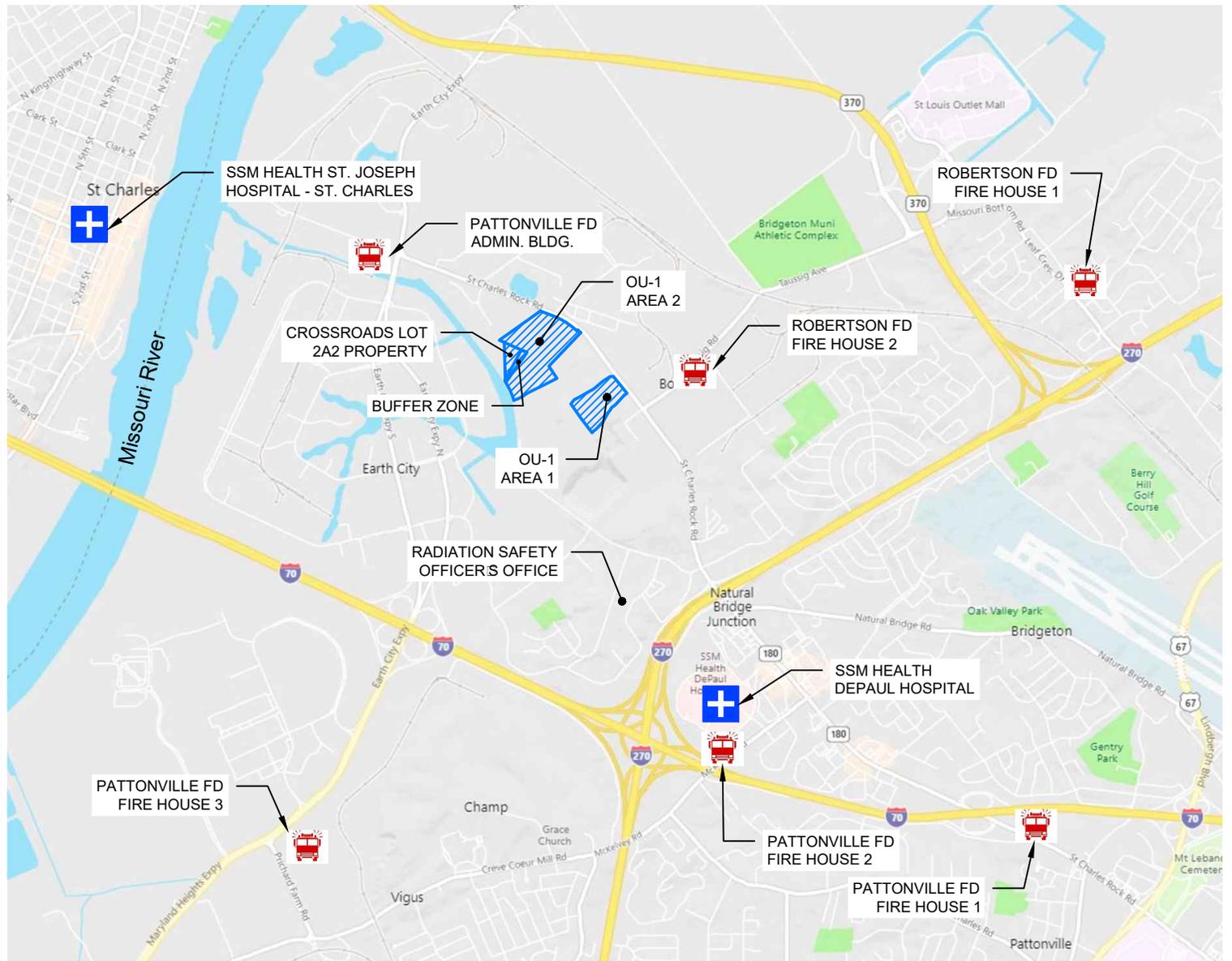
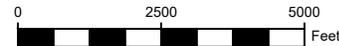


Image: © 2019 HERE, Open Street Map

NOTE:

1.) BASED ON FIGURES ORIGINALLY PREPARED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. AND PRESENTED IN THE MARCH 28, 2019 INCIDENT MANAGEMENT PLAN



PREPARED BY



3377 Hollenberg Dr, Bridgeton, MO 63044, Ph: 217-483-3118
Missouri State Certificate Of Authority #: E-200912211

PROJECT

WEST LAKE LANDFILL
SITE MANAGEMENT PLAN
BRIDGETON, MISSOURI 63044

MAY 2019

DESIGNED BY: IN

APPROVED BY: ---

FIGURE 1

DRAWING TITLE

HOSPITAL LOCATION

PROJECT NUMBER: BT-191.5

FILE PATH: D:\Dropbox (Feezor Engineering)\Bridgeton\BT-191 (RDWP Design And Management)\BT-191.5 - 02500 - Emergency Response Plan\Figures\BT-191.5-ERP Figures

Appendix 4

Bridgeton Landfill Incident Management Plan

INCIDENT MANAGEMENT PLAN (IMP)

with

CONTINGENCY PLAN AND EMERGENCY PROCEDURES

BRIDGETON LANDFILL and WEST LAKE LANDFILL

Prepared for:

WEST LAKE LANDFILL OPERABLE UNIT-1 RESPONDENTS

Prepared by:

Bridgeton Landfill LLC
Bridgeton, Missouri

Based on a plan previously prepared for Bridgeton Landfill, LLC by

Engineering Management Support, Inc.
Golden, Colorado

Civil and Environmental Consultants
St. Louis, Missouri

March 21, 2016

First Revision June 8, 2016

Second Revision January 26, 2017

Third Revision October 6, 2017

Fourth Revision March 1, 2018

Fifth Revision March 28, 2019

Table of Contents

1.0	DEFINITIONS	3
2.0	INTRODUCTION	5
3.0	DESCRIPTION OF BRIDGETON LANDFILL AND WEST LAKE LANDFILL	8
4.0	INCIDENT PREVENTION	10
5.0	RESPONSE AND INCIDENT STRATEGIES	13
6.0	RESUMPTION AND RESTORATION	16
7.0	AFTER INCIDENT REPORTING	18
8.0	AMENDMENT OF PLAN	19

TABLES

- Table 1 – Responsibilities and Contacts
- Table 2 – List of Available On-Site Resources
- Table 3 – Supporting Plans and Documents

FIGURES

- Figure 1 – Facility Location
- Figure 2 – Facility Map
- Figure 3 – Fire Hydrant Locations
- Figure 3A – Emergency Locator Map
- Figure 4 – Chemical Storage Areas
- Figure 5 – Final Extent of NCC and Site Features Area 1
- Figure 6 – Final Extent of NCC and Site Features Area 2
- Figure 7 – Emergency Access Road Plan Proposed Conditions
- Figure 8 – Emergency Access Road Plan Truck Schematics
- Figure 9 – Knife Gate Valve Location Map

ATTACHMENTS

- Attachment A - Response and Incident Strategies for Potential Incidents
- Attachment B – Facility Emergency Coordinator Checklist / Emergency Responder
Communication
- Attachment C – Spill Prevention and Response for Leachate
- Attachment D – On-Site Fire Hydrant Flow Test Reports
- Attachment E – SDS (provided separately)

1.0 DEFINITIONS

Facility Emergency Coordinator	Bridgeton Landfill employee identified with the responsibility for initial assessment and coordination of response activities with Regulatory and Local Authorities.
Health and Safety Plan (HASP)	A task-specific document that is prepared for each activity conducted in OU-1. The HASP includes a description of the work to be performed, an evaluation of potential hazards and controls to mitigate such hazards, training requirements, general health and safety procedures, and emergency contacts, procedures, and contingency plans.
Incident	A situation that is non-routine or is anomalous and which poses a threat to the health and safety of onsite personnel or the public, or which may develop into such.
Incident Commander	A representative of a governmental emergency response agency to which all other responders report.
Operable Unit-1 (OU-1)	Operable Unit-1 of the West Lake Landfill Superfund Site, which consists of two solid waste disposal areas (Areas 1 and 2) and a parcel of land known as the “Buffer Zone” in which radionuclides have been identified. Areas 1 and 2 and the Buffer Zone are depicted on Figure 2.
Radiation Safety Plan (RSP)	A task-specific document that is prepared for each activity conducted in OU-1. The RSP describes individual and organizational responsibilities, radiation protection requirements, health physics controls, reporting and recordkeeping procedures, emergency response procedures, and an evaluation of potential radiological doses from the anticipated tasks to identify the processes and tasks that pose the greatest potential for exposure, and, if necessary, modifications to these processes to keep the radiation doses As-Low-As-Reasonably-Achievable (ALARA).

Radiation Safety Technician	A health physicist who will provide radiation safety monitoring, radiation screening of all personnel and equipment exiting OU-1, and be available for general consulting to the first responders regarding radiation, radiation protection and radiation monitoring.
Regulatory Authorities	Governmental agencies responsible for permitting and regulation of activities associated with, or affected by, the landfill. These include (although are not necessarily limited to): the MDNR, the St. Louis Metropolitan Sewer District (MSD), the U.S. EPA, St. Louis County Department of Health (DoH), and the Federal Aviation Administration (FAA).
Local Authorities	Parties that have a role or interest in emergency response including (but not necessarily limited to): Local police and fire departments, emergency responders (i.e., EMS/paramedics/ambulance services), St. Louis County Local Emergency Planning Committee, Lambert-St. Louis International Airport, and the City of Bridgeton.
Level 0 Incident	An incident that can be handled entirely by on-site Bridgeton Landfill, LLC personnel and equipment. In some cases, notification to Local Authorities and/or Regulatory Authorities may be necessary.
Level 1 Incident	An incident that requires assistance of Local Authorities to remedy. May include potential harm to life, safety, or health of on-site personnel.

2.0 INTRODUCTION

This Incident Management Plan (IMP) for the West Lake Landfill Superfund Site describes plans to prevent incidents, required protocol for initial incident emergency calls, coordination of responses, and resumption of normal activities (in case of interruption). As used throughout this plan, the term “incident” means a situation that is non-routine or is anomalous and which poses a threat to the health and safety of onsite personnel or the public, or which may develop into such.

The West Lake Landfill Superfund Site (the “site”) is a 200-acre site located in the western portion of St. Louis County near the intersection of Interstate 70 and Interstate 270, approximately 1.5 miles east of the Missouri River (Figure 1). The site is bounded to the east and northeast by St. Charles Rock Road (State Highway 115). Commercial and industrial properties bound the site immediately to the north, across St. Charles Rock Road to the north and east, and to the south. The site is bounded to the west by Old St. Charles Rock Road (now vacated) and the Earth City Industrial Park stormwater/flood control pond. The Earth City complex continues to the west and north of the stormwater/flood control pond and extends from the site to the Missouri River. Earth City is separated from the river by an engineered levee system owned and maintained by the Earth City Flood Control District.

The West Lake Landfill Superfund Site consists of two separate landfills: the West Lake Landfill and the Bridgeton Landfill. West Lake Landfill includes four identified waste disposal areas: Radiological Area 1 (Area 1), Radiological Area 2 (Area 2), a closed demolition landfill, and an inactive sanitary landfill. Waste materials containing radionuclides have been identified in the two solid waste disposal areas designated as Areas 1 and 2, in which municipal solid waste (MSW) and industrial wastes were disposed from approximately the late 1940s or early 1950s until these areas ceased accepting waste in 1974. Based on the presence of radionuclides in these two areas, EPA designated these two areas as Operable Unit-1 (OU-1) of the West Lake Landfill Superfund Site. The other areas were designated as part of Operable Unit-2 (OU-2).

The permitted Bridgeton Landfill, which includes the North and South Quarry Areas, is also located at the site (Figure 2) and has been designated as part of OU-2. In 1979, landfilling began in the North Quarry pit. Landfilling continued in this area until 1985, when the landfill underwent expansion to the southwest into the South Quarry pit. Bridgeton Landfill is currently an inactive landfill, having stopped receiving waste in December 2004 pursuant to an agreement with the City of St. Louis to reduce the potential for birds to interfere with airport operations.

Pursuant to a Unilateral Administrative Order for Removal Action (EPA Docket No. CERCLA-07-2016-0002) (the UAO), EPA is requiring the named West Lake Landfill Superfund Site Operable Unit-1 Respondents (Bridgeton Landfill, LLC, Rock Road Industries, Inc., and Cotter

Corporation (N.S.L.)) to prepare an incident management plan for OU-1 of the West Lake Landfill. Because there are no ongoing activities associated with OU-1 other than various investigations and monitoring (*i.e.*, active landfilling operations in Areas 1 and 2 ceased in 1974, as noted above), and because of the relative proximity of OU-1 to the Bridgeton Landfill, Bridgeton Landfill onsite personnel will likely be the first to identify a possible incident within OU-1 and initiate response activities. Consequently, it was determined that, rather than preparing a separate IMP for West Lake Landfill, the existing Bridgeton Landfill IMP would be modified to address potential incidents that might occur within or related to West Lake Landfill OU-1. Therefore, this plan is based on and augments a plan previously prepared by Civil and Environmental Consultants, Inc. (CEC) for Bridgeton Landfill to prevent and respond to incidents specifically related to Bridgeton Landfill (CEC, 2015).

At the Bridgeton Landfill, risks can result from the use of large mobile and stationary equipment, handling of combustible materials, and the management of waste byproducts such as decomposition gases and liquid leachate. Further, a recognized exothermic chemical reaction (referred to as a “subsurface reaction,” or SSR) is occurring within a portion of the South Quarry area of the Bridgeton Landfill. Such heat-generating reactions can increase the potential hazards and the likelihood of an incident. An Operation, Maintenance, and Monitoring (OM&M) Plan has been submitted separately to the Missouri Department of Natural Resources (MDNR) to describe special observations and preventative maintenance procedures that Bridgeton Landfill personnel are implementing to manage the Bridgeton Landfill and SSR. The OM&M Plan requires that monitoring and work activity reports be generated and submitted to the MDNR, allowing constant tracking of the status of the SSR.

In addition to the OM&M Plan, the Bridgeton Landfill is required to have various spill prevention plans, leachate treatment and handling protocols, surface water management plans, and air quality plans. All of these plans can be found at the Bridgeton Landfill facility office.

If a trigger value is exceeded in the North Quarry area of the Bridgeton Landfill, procedures outlined in the decision tree presented in Figure 2 of the facility’s Inert Gas Injection Work Plan for Hot Spot Remediation will be implemented. A copy of the Inert Gas Injection Work Plan for Hot Spot Remediation can be found at the Bridgeton Landfill facility office.

Bridgeton Landfill creates, stores, treats and disposes of leachate as part of its operation. Chemicals associated with leachate treatment are located in storage areas identified on Figure 4. Constituents contained in the leachate have, at times, exceeded levels at which it could be classified as a hazardous waste in accordance with the Code of Federal Regulations (CFR) Part 261. Specifically, some of the leachate has occasionally exceeded the RCRA TCLP hazardous threshold for benzene, which carries the waste code D018. Leachate is currently treated in a

Clean Water Act permitted waste water treatment unit and the facility is a Conditionally Exempt Small Quantity Generator. However, as a proactive measure, Bridgeton Landfill implemented contingency planning, training and safety measures meeting the requirements applicable to a large quantity hazardous waste generator (40 CFR Part 262), including certain provisions of 40 CFR Part 265. As such, this IMP has also been developed to meet the requirements of 40 CFR 265, Subpart D – Contingency Plan and Emergency Procedures.

Based on the presence of radionuclides in West Lake Landfill OU-1, this area has been designated as restricted and as such is completely fenced, and access to this area is controlled. As noted above, the only activities that occur within OU-1 are related to investigations and actions conducted pursuant to orders issued by EPA. These investigations and actions are performed pursuant not only to the overall Bridgeton Landfill Health and Safety Plan (Bridgeton Landfill HASP) but also in accordance with health and safety plans prepared for each specific work task to be conducted in OU-1 (WLL Task-Specific HASPs). These WLL Task-Specific HASPs address not only personnel protection and monitoring but also responses to certain types of incidents such as personnel injuries.

These Task-Specific HASPs, however, do not address responses to fire or other non-task related incidents that may occur at the site, which are the subject of this IMP. In particular, this IMP includes a framework for notification and protection of first responders and other non-OU-1 personnel from potential exposure to radionuclides and radiation should such individuals need to enter OU-1 during a response to a possible incident.

The remainder of this IMP is composed of the following sections:

- 3.0 Description of Bridgeton Landfill and West Lake Landfill – Location, access, size, and facilities are described.
- 4.0 Incident Prevention – Describes measures for incident prevention, assignment of Emergency Coordinators, and communication and coordination with Regulatory and Local Authorities.
- 5.0 Response and Incident Strategies – Presents response scenarios for a number of identified potential incidents.
- 6.0 Resumption and Restoration – In the case of service interruptions, this section describes the process for resuming operations, including regulatory approvals.
- 7.0 After-Incident Reporting – Describes the reporting actions to be taken after an incident has occurred at the site.
- 8.0 Amendment of Plan – Describes the frequency and process for updating and amending the IMP.

3.0 DESCRIPTION OF BRIDGETON LANDFILL AND WEST LAKE LANDFILL

1. Bridgeton Landfill

Bridgeton Landfill is an inactive municipal solid waste landfill located at 13570 St. Charles Rock Road in Bridgeton, Missouri (see attached site location map, Figure 1). The site was formerly mined for limestone, resulting in large, open pits which were over 200 feet deep. Beginning in the late 1940s or 1950s, portions of the property were backfilled with municipal wastes, industrial wastes, and construction and demolition debris. Landfill operations ceased in 2004.

The Bridgeton Landfill (see Figure 2 for location) covers about 52 acres of the larger 214-acre property that comprises the West Lake Landfill Superfund Site, and is a primary focus of this IMP. In addition, a hot mix asphalt batch plant, a waste transfer station, two legacy disposal areas, discussed below, and many appurtenant features are present on the site property. See Figure 2 for the facility layout and access.

Although active landfilling operations have ceased, many other activities are occurring at the Bridgeton Landfill, including:

- Placement and maintenance of cover materials;
- Collection, management, and destruction of landfill decomposition gas;
- Generation, collection, storage, treatment and disposal of landfill leachate; and
- Operation of a waste transfer station, at which waste is transferred from small local collection trucks into large long-haul trucks for transportation to a remote landfill.

When waste material decomposes, a biological process increases its temperature and produces combustible gasses (primarily methane). Portions of the Bridgeton Landfill South Quarry area are experiencing higher-than-typical temperatures resulting from a heat-generating (exothermic) subsurface reaction (SSR) taking place beneath the landfill surface within the waste mass. Heightened monitoring and maintenance of the facility is required to control the SSR and its effects.

2. West Lake Landfill OU-1

West Lake Landfill OU-1 includes two distinct and separate areas (Areas 1 and 2) outside the Bridgeton Landfill. Waste materials containing radionuclides have been identified in the two solid waste disposal areas designated as Area 1 and Area 2, in which municipal solid waste (MSW) and industrial wastes were disposed from approximately the late 1940s to early 1950s

until these areas ceased accepting waste in 1974. OU-1 also encompasses the parcels of land identified as the “Buffer Zone” and Crossroads Lot 2A2, both located adjacent to Area 2. The primary possible radionuclide exposures within these areas are associated with direct radiation exposure from gamma radiation and direct contact, ingestion, or inhalation of radiologically-impacted material (“RIM”).

4.0 INCIDENT PREVENTION

Many voluntary and required programs and documents are used at the Bridgeton and West Lake Landfills to minimize hazards and protect the health and safety of both onsite personnel and the public at large. A partial list and description of these programs and documents is provided below. A complete listing, including the locations where copies of these documents are maintained at the site, is included as Table 3.

Missouri Department of Natural Resources Solid Waste Disposal Operating Permit #118912

This permit and accompanying permit application documents govern the previous operation and the current closure and post-closure activities at the Bridgeton Landfill. These documents are available at the Bridgeton Landfill office.

Bridgeton Landfill Health and Safety Plan (HASP)

This site-specific plan details safety protocols. The HASP focuses on the specific health and safety hazards that are related to working in and around a landfill and requires landfill personnel to receive certain training pursuant to Occupational Health and Safety Administration (OSHA) regulations (among other requirements) in advance of performing certain tasks.

Bridgeton Landfill Operation, Maintenance, and Monitoring Plan (OM&M Plan)

As noted above, an SSR is occurring within a portion of the South Quarry of the Bridgeton Landfill. The OM&M Plan describes special observations and preventative maintenance procedures which are currently being implemented by Bridgeton Landfill personnel. Among other things, the OM&M Plan requires that monitoring and work activity reports be routinely generated and submitted to the MDNR, allowing constant tracking of the status of the SSR.

In addition to the above documents, Bridgeton Landfill is required to have various spill prevention plans, leachate treatment and handling protocols, surface water management plans, and air quality plans. All of these plans can be found at the Bridgeton Landfill office.

West Lake Landfill OU-1 Health and Safety and Radiation Safety Plans and Procedures

Activities conducted to prevent potential incidents or minimize the impacts if an incident were to occur within West Lake Landfill OU-1 are set forth in the various West Lake Landfill OU-1 Health and Safety and Radiation Safety Plans and Procedures.

A task-specific HASP is prepared for each activity that is conducted in West Lake Landfill OU-1. The HASP includes a description of the work to be performed, an evaluation of potential hazards and controls to mitigate such hazards, training requirements, general health and safety procedures, and emergency contacts, procedures and contingency plans. A Radiation Safety Plan (RSP) is also prepared for each task. The RSP describes individual and organizational responsibilities, radiation protection requirements, health physics controls, reporting and record keeping procedures, emergency response procedures, and an evaluation of potential radiological doses from the anticipated tasks in order to identify the processes and tasks that pose the greatest potential for exposure and, if necessary, modifications to these processes and tasks to keep the radiation doses As-Low-As-Reasonably-Achievable (ALARA). All personnel working within OU-1 are required to read the HASP and RSP before beginning work on any task.

In addition, a daily Job Safety Analysis (JSA) is prepared for each activity to be conducted each day. The JSA describes the specific activities to be conducted, any hazards associated with such activities, and controls to mitigate these hazards.

All personnel that enter OU-1 are required to have completed a 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and associated annual 8-hour update training, as specified by OSHA under 29 CFR 1910.120. In addition, all personnel who enter OU-1 are required to participate in General Employee Radiation Training (GERT) every two years.

Finally, all personnel who work within OU-1 are required to attend daily health and safety briefings that cover the work to be performed within OU-1 on a particular day, potential hazards that may be encountered, and safety procedures to avoid such potential hazards.

Access and Staffing

The Bridgeton Landfill is staffed 24 hours a day, 7 days a week, including holidays. During business hours, Bridgeton Landfill is staffed by technicians, specialists, managers, and third-party consultants/contractors – all of whom have received Bridgeton Landfill’s site-specific contractor training, which includes an overview of health and safety and emergency response measures. In addition, during the night shift, third-party contractors are employed to complete various tasks, including hazard identification, at and around the site. Finally, a manager is on call at all times (see Table 1 for contact information) to respond to incidents and is trained in all elements of this IMP such that the IMP will be implemented twenty-four (24) hours per day, seven (7) days per week.

Personnel are generally also present in OU-1 approximately 10-12 hours per week in conjunction with ongoing investigation and removal action activities. The Radiation Safety Technician and the OU-1 Project Coordinator and their designated alternate contacts (the OU-1 Field Coordinator and the OU-1 Project Coordinator alternative point of contact, respectively) are also on call at all times (see Table 1 for contact information) and are trained (or will be trained upon finalization of this Plan) in all elements of this IMP such that the IMP can be implemented by OU-1 personnel.

Surveillance

The Bridgeton Landfill currently has continuous, controlled access and a 24/7 routine inspection monitoring program in place. In addition to this program, Bridgeton Landfill has identified two additional surveillance observation points (see Figure 3) which have been added to the routine inspection program to augment surveillance of OU-1. Visual inspections of OU-1 will be performed on a regular and continuous basis until it is demonstrated that the remaining vegetation does not pose a risk of release. Figures 5 and 6 illustrate the extent of two-inch minus NCC in Areas 1 and 2, respectively. The 24-hour controlled access to OU-1 (as well as oversight during all activities conducted in OU-1) will continue through implementation of the EPA-selected remedial actions for OU-1.

5.0 RESPONSE AND INCIDENT STRATEGIES

An “incident” is a situation that is non-routine or is anomalous and which poses a threat to the health and safety of onsite personnel or to the public, or which may develop into such.

Bridgeton Landfill has designated a Facility Emergency Coordinator who is responsible for determining if a situation rises to the level of an incident (see Table 1 for Facility Emergency Coordinator designation as well as other responsible parties). The Facility Emergency Coordinator will at all times be a Bridgeton Landfill employee who is thoroughly familiar with (1) all aspects of this plan, (2) all operations and activities at the site, (3) the location and characteristics of hazardous or potentially hazardous materials at the site, (4) the location of all relevant records at the site, and (5) the site layout.

When an incident occurs, the Facility Emergency Coordinator will make an initial assessment of the severity of the incident and classify it as Level 0 or Level 1 (see definitions in Section 1.0 of this Plan) based on the nature of the incident. Depending on the severity of the incident, Regulatory Authorities and/or Local Authorities may become involved. A checklist of some of the important incident management steps to be taken by the Facility Emergency Coordinator is presented in Attachment B. In the event 911, the EPA spill line, or the MDNR spill line is called regarding an incident at Bridgeton Landfill or West Lake Landfill, it is requested that the operator notify Bridgeton Landfill Facility Emergency Coordinator or Alternate (see Table 1). At this time, identified potential incidents at the site fall into one of the following categories:

- Incoming Call to 911 / EPA Spill Line / MDNR Spill Line Regarding Bridgeton / West Lake Landfills;
- Bridgeton Landfill Surface Fire (vegetation or landfill fire);
- Bridgeton Landfill Personal Injury – Man Down / Personnel Contamination;
- Bridgeton Landfill Sudden Waste Movement;
- Bridgeton Landfill Leachate Release;
- West Lake Landfill OU-1 Surface Fire (vegetation or landfill fire);
- West Lake Landfill OU-1 Personal Injury – Man Down / Personnel Contamination; and
- West Lake Landfill Sudden Waste Movement;

Site entrances are shown on the attached Figure 2; evacuations, if necessary, may be made at any of these entrances. Internal communications are provided to appropriate facility personnel through two-way radio or cell phones. In the event of an emergency or required response or evacuation, the radio-equipped personnel will circulate the facility to provide appropriate notifications.

First responders are also expressly permitted to gain access to the facility utilizing emergency measures (e.g. cutting gate locks, etc.).

Figure 7 illustrates the roads around the facility that are constructed on native ground and lists names for each road. Signage has been installed around the facility delineating native versus non-native roads, fire hydrant locations, and road names to provide first responders visual references in the field. Additional alternate entrances were recently constructed to provide better first responder access across the facility; these additional entrances are labeled on Figure 7. AutoTURN® software was utilized to simulate the required turn radius of emergency vehicles. Emergency vehicle dimensions input into AutoTURN® are illustrated on Figure 8. Figure 9 illustrates the locations of stormwater knife gates located around the Bridgeton Landfill. Stormwater knife gate procedures are discussed in the response and incident strategies.

Attachment A contains the response and incident strategies for each of these potential incidents, including the procedures for notification by Bridgeton Landfill personnel to Local Authorities and Regulatory Authorities.

The same types of potential incidents identified for Bridgeton Landfill also apply to West Lake Landfill, with the exception of a possible leachate release because there are no leachate collection or handling systems in OU-1. The anticipated responses to a surface fire incident, personal injury/man down/personnel decontamination incident, or sudden waste movement incident are the same as those for Bridgeton Landfill, except that there are no landfill gas extraction wells within OU-1 and therefore the response action of turning off gas extraction wells does not apply. Furthermore, because OU-1 is under exclusive EPA jurisdiction, EPA would be the primary regulatory agency to be notified relative to an incident in OU-1, as opposed to MDNR as specified for an incident related to Bridgeton Landfill. See the above pages for details of the incident response measures to be applied in the event of the different incidents specified therein.

In addressing an incident that may occur within the boundaries of OU-1, the following priorities should be followed:

1. Address the incident from outside of OU-1 to the extent possible (such as performing fire suppression actions from outside the boundaries if possible);
2. If entry is required into OU-1 to respond to an incident, make every attempt to confine vehicles and personnel to the roads and portions of OU-1 that are covered by rock material; and

3. If entry into portions of OU-1 that are not covered by rock is necessary, utilize Tyvek suits, boot covers and plastic gloves (available at the OU-1 Area 1 and Area 2 command trailers shown on Figure 3) to the extent possible.

These practices are described in more detail in the OU-1 Radiation Safety Plan.

In the event that entry into OU-1 is necessary, all personnel and equipment should be subject to radiation screening upon exiting OU-1. Radiation screening will be provided by the OU-1 Radiation Safety Technician or the OU-1 Field Coordinator (see Table 1) in accordance with the West Lake Landfill OU-1 Radiation Safety Plan (RSP), which is included as part of the West Lake Landfill OU-1 Health and Safety Plan.

In addition, because of the presence of radionuclides in OU-1, the West Lake Landfill OU-1 Radiation Safety Technician and the OU-1 Project Coordinator should be contacted (see Table 1) in order to coordinate the provision of any additional personnel protective equipment that may be required for entry into OU-1 (*e.g.*, Tyvek suits, boot covers, gloves, etc.) beyond that used by incident responders or other personnel that perform work in OU-1, as well as health physics services for monitoring and screening of personnel and equipment in the event that personnel or equipment need to enter OU-1 as part of any incident response.

Contact information for the various personnel listed above is provided on Table 1. Based on their prior training and/or experience, these personnel are qualified to respond to emergencies at or in OU-1.

Currently, office trailers and associated facilities (*e.g.*, equipment decontamination pads, decontamination water, and investigative-derived waste storage units, etc.) are located at the entrances to both OU-1 Areas 1 and 2. The locations of these facilities are shown on Figure 3. These facilities will be maintained to serve as potential additional command post locations in the event that an incident occurs in OU-1. Use of the OU-1 Area 1 and 2 command posts as possible additional command post locations (beyond those previously identified above) for responding to an incident that may occur in OU-1 is subject to the nature of the incident as well as wind direction at the time.

In the event that an incident in OU-1 includes a surface fire or a breach or potential breach of the NCC directed by EPA pursuant to the UAO, and the response to such an incident involves application of water that could run off of OU-1 (*e.g.*, use of water to suppress a vegetation fire), temporary berms will be constructed within the downstream stormwater channels as necessary to create temporary retention structures to prevent water from running off the site into the stormwater conveyance system along the perimeter of OU-1 and OU-2. Any runoff water

(including fire suppression water) that may accumulate within such temporary retention structures will subsequently be pumped into storage tanks and tested to determine the appropriate method for ultimate management and disposition of such water. Figures 5 and 6 illustrate the extent of two-inch minus NCC in Areas 1 and 2, respectively.

In the event of a response to an incident in OU-1, an incident that involves the breach or potential breach of the noncombustible cover, or an incident that could otherwise pose a potential for release of dust-containing radionuclides, monitoring data obtained from the existing OU-1 perimeter air monitoring program (*Air Monitoring, Sampling, and QA/QC Plan, West Lake Superfund Site Operable Unit 1*, prepared by Auxier & Associates, Inc. October 2014 and subsequent revisions) will be collected and evaluated by OU-1 personnel to assess the potential for a release and any impacts that may have been associated with such a release and will be provided to EPA and MDNR.

In the event of an incident that could impact the health or safety of adjacent property owners or the community, the St. Louis Office of Emergency Management will be contacted to coordinate community notification efforts.

6.0 RESUMPTION AND RESTORATION

Severe incidents could result in damage to facility infrastructure or an interruption in maintenance activities or operation of the transfer station. Bridgeton Landfill has ongoing retention agreements with a number of third-party contractors who can assist with restoration of critical site operation and maintenance functions.

In cases of Level 1 incidents, the Incident Commander will be involved in the decision and timing of resumption of activities. Restoration will be coordinated with the MDNR and/or EPA so that the site meets all applicable requirements.

In case of damage to equipment, Bridgeton Landfill personnel will follow applicable provisions of 40 CFR 265.196 regarding inspection, return-to-service, and certification of major repairs to any damaged equipment that has resulted in a release of a regulated substance. All emergency equipment listed in this plan will be replaced or cleaned and fit for its intended use before operations are resumed. Contaminated materials and personnel protective equipment will be properly characterized and managed.

Because there are no ongoing operations associated with West Lake Landfill OU-1, resumption of service provisions are not applicable to West Lake Landfill. In the event that an incident occurs during the conduct of site investigation, monitoring, or removal action activities, provisions related to possible suspension and subsequent resumption of such activities are addressed in the task-specific HASPs.

In the event of an incident that poses a potential for release of hazardous substances from OU-1, a plan will be prepared after the incident response is complete to evaluate whether hazardous substances were released and if so the nature and extent of such a release. The plan will be provided to EPA for review and will be implemented upon receipt of EPA approval.

7.0 AFTER INCIDENT REPORTING

As soon as reasonably possible after an incident that requires the implementation of the procedures in this plan, the Facility Emergency Coordinator will prepare a written report that records the time, date, and details of the incident. At a minimum, this report will include:

- The name, address, and contact information for the site;
- The date, time, and type of incident (e.g., fire, explosion, injury, etc.);
- The name and quantity of hazardous materials released as a result of the incident, if any, as well as the estimated quantity and disposition of any recovered materials;
- The nature and extent of injury to onsite personnel, if any;
- An assessment of actual or potential hazards to human health or the environment; and
- A description of the steps taken to address the incident and to ensure the health and safety of onsite personnel and the public.

Within 15 days of a Level 1 incident, the Facility Emergency Coordinator will submit this report to EPA, MDNR, and, as appropriate, Local Authorities. In the case of a Level 0 incident, the after-incident report may be submitted to EPA, MDNR, or Local Authorities at the discretion of the Facility Emergency Coordinator, or as circumstances may otherwise dictate. In all cases, a copy of the report will be retained onsite in a location accessible to Bridgeton Landfill employees.

8.0 AMENDMENT OF PLAN

This plan will be reviewed, and amended, if necessary, whenever:

- Applicable regulations are revised;
- The plan fails in an emergency;
- The facility changes its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency;
- As deemed appropriate by Bridgeton Landfill personnel or the Facility Emergency Coordinator;
- Upon request/input of regulatory authorities;
- The list of emergency coordinators changes; and/or
- The list of emergency equipment changes.

In addition, Bridgeton Landfill holds quarterly meetings with the various first responders designated by Local Authorities to discuss site activities and incident response procedures. The OU-1 Project Coordinator attends these meetings periodically or as requested by Bridgeton Landfill or the Local Authorities.

Any proposed revisions or updates to this plan will be provided to local responders, MDNR and EPA for review and comment and EPA approval.

TABLES

BRIDGETON LANDFILL AND WEST LAKE LANDFILL

Incident Management Plan

TABLE 1

RESPONSIBILITIES AND CONTACTS (updated March 28, 2019)	
Primary Emergency Contact – Dial 911	
<i>Bridgeton Landfill Site Personnel – 13570 St. Charles Rock Road, Bridgeton, MO 63044</i>	
Facility Emergency Coordinator	Erin Fanning Office: (314) 744-8165 Cell: (209) 227-9531
Alternate Emergency Facility Coordinator	Mike Lambrich Office: (314) 744-8175 Cell: (314)-683-3921
Alternate Emergency Facility Coordinator	Matt Stewart Office: (314) 656-2130 Cell: (314) 477-6140
<i>West Lake Landfill Operable Unit-1 Personnel</i>	
Radiation Safety Technician	Bill Abernathy (Feezor Engineering, Inc.) Cell: (314) 502-1299
OU-1 Field Coordinator	Jon Wilkinson (Feezor Engineering, Inc.) Cell: (636) 578-8635
OU-1 Project Coordinator	Paul Rosasco (Engineering Management Support, Inc.) Cell: (303) 808-7227
OU-1 Project Coordinator – alternate point of contract	Dan Feezor (Feezor Engineering, Inc.) Cell: (217) 836-8842
<i>Regulatory Authorities</i>	
MDNR–Solid Waste Management Program — Compliance/Enforcement Section	Mike Parris Office: (573) 526-3918 Cell: (573) 680-6669
MDNR–Solid Waste Management Program — Director	Chris Nagel Office: (573) 751-5401 Cell: (573) 680-5146 Cell: (573) 690-5371
MDNR – Department of Health and Senior Services	Keith Henke Cell: (573) 645-8943
MDNR–Environmental Emergency Response (Spill Line)	Hot Line: (573) 634-2436
MDNR–Environmental Emergency Response – St. Louis Region -- Route 66	Skip Ricketts Cell: (314) 608-5656
St. Louis County Department of Health	Mark Milward Office: (314) 615-4116 Cell: (314) 520-1373
EPA Region 7 – Regional Project Manager	Christine Jump Office: (913) 551-7141 Cell: (816) 398-1965

BRIDGETON LANDFILL AND WEST LAKE LANDFILL

Incident Management Plan

EPA Region 7 – On-Scene Coordinator	Tom Mahler Cell: (816) 604-0546
EPA Region 7 Spill Line	(913) 281-0991
<i>Local Authorities</i>	
Robertson Fire Dept.	Maynard Howell – Asst. Fire Chief Cell: (314) 575-5011
Pattonville Fire Dept.	Battalion Chief (Primary Contact) Cell: (314) 393-4802 Jim Usry (Secondary Contact) Cell: (314) 393-4807 Office: (314) 739-3118
Bridgeton Police Dept.	Chief Hood (Primary Contact) Cell: (314) 420-9112 Major Mossotti (Secondary Contact) Cell: (314) 602-3632
St. Louis County Office of Emergency Management (OEM)	Mark Diedrich – LEPC Coordinator Office: (314) 615-9500 Bureau of Communications 24/7 Emergency: (314) 615-5360
<i>Other Contacts</i>	
SSM DePaul Health Center	(314) 344-6000
St. Joseph Health Center	(636) 947-5000
National Response Center	(800) 424-8802

BRIDGETON LANDFILL AND WEST LAKE LANDFILL

Incident Management Plan

TABLE 2

LIST OF AVAILABLE ON-SITE RESOURCES	
<i>Resource</i>	<i>Quantity</i>
Fire Hydrants	4 (see Figure 3A)
Soil Stock Pile	10,000 cubic yards (see Figure 3A)
Bulldozer	2
Front-End Loader	2
Water Truck (3500 gallon with cannon)	1
Water Truck (2000 gallon pump truck)	1
Water Truck Adaptor to 5" Storz Fitting	1
Excavators	2
Spill Cleanup Kits*	14
Eye Wash Station*	8
Portable Fire Extinguishers*	59
Steel Gate for Culverts	18
Vacuum Trucks	2
ATVs (2-man with tool bed)	7
ATV (4-man with tool bed)	1
Aluminized Approach Suits	2
PVC flame resistant hot liquid suits	~30
Multi RAE Lite VOC Meter	1
UltraRAE 3000 Benzene Specific PID Meter	1
RKI GX-2009 4 Gas Meters	15
RKI GX-6000 5 Gas Meter w/ Benzene Specific PID Meter	1
Five-gallon Containers Class A, SFFF Structural Fire Foam**	40
Tyvek suits, boot covers, and gloves	100+ ***
Straw waddles (8 in x 25 ft)****	4
Ludlum Model 12 with a 44-9 Probe	1
Ludlum Model 2360 with a 43-93 Probe	1

Note: Bridgeton Landfill routinely maintains the heavy and light duty equipment listed above.

*At all facility vehicles, each flare yard, leachate loadout and MBI maintenance building

** At Leachate Pretreatment Plant in storage bay on east side of building (See Figure 3)

***At OU-1 Area 1 and 2 Trailers, the Radiation Safety Technician, and OU-1 Field Coordinator have keys and keys also maintained at the Bridgeton Landfill office building

****At the OU-1 Area 1 and 2 Trailers; also available at Home Depot and Lowes.

BRIDGETON LANDFILL AND WEST LAKE LANDFILL

Incident Management Plan

TABLE 3

DOCUMENTS AND PLAN (updated March 28, 2019)	
Document	Location
MDNR Solid Waste Disposal Operating Permit #118912	Bridgeton Landfill Office
Bridgeton Landfill Health and Safety Plan (HASP) 2016	Bridgeton Landfill Office
Bridgeton Landfill Operation Maintenance and Monitoring Plan (OM&M Plan) March 2018	Bridgeton Landfill Office
West Lake Landfill OU-1 Health and Safety Plan (OU-1 HASP) February 8, 2016	OU-1 Area 1 and Area 2 Trailers
West Lake Landfill OU-1 Radiation Safety Plan (RSP) (part of the OU-1 HASP) January 4, 2016	OU-1 Area 1 and Area 2 Trailers
Air Monitoring, Sampling, and QA/QC Plan, West Lake Superfund Site Operable Unit 1 October 2014	OU-1 Area 1 and Area 2 Trailers

FIGURES

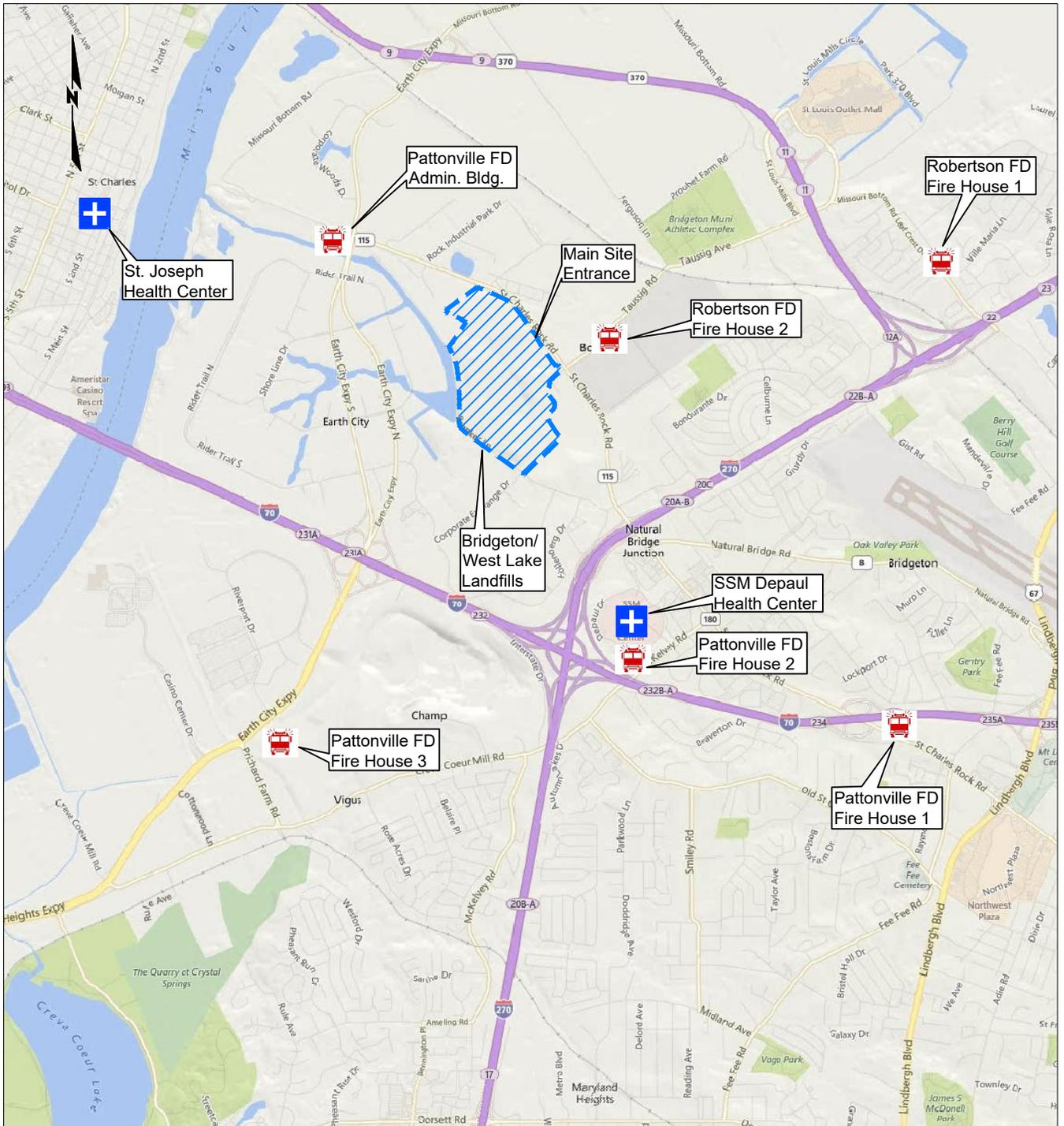


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Civil & Environmental Consultants, Inc.

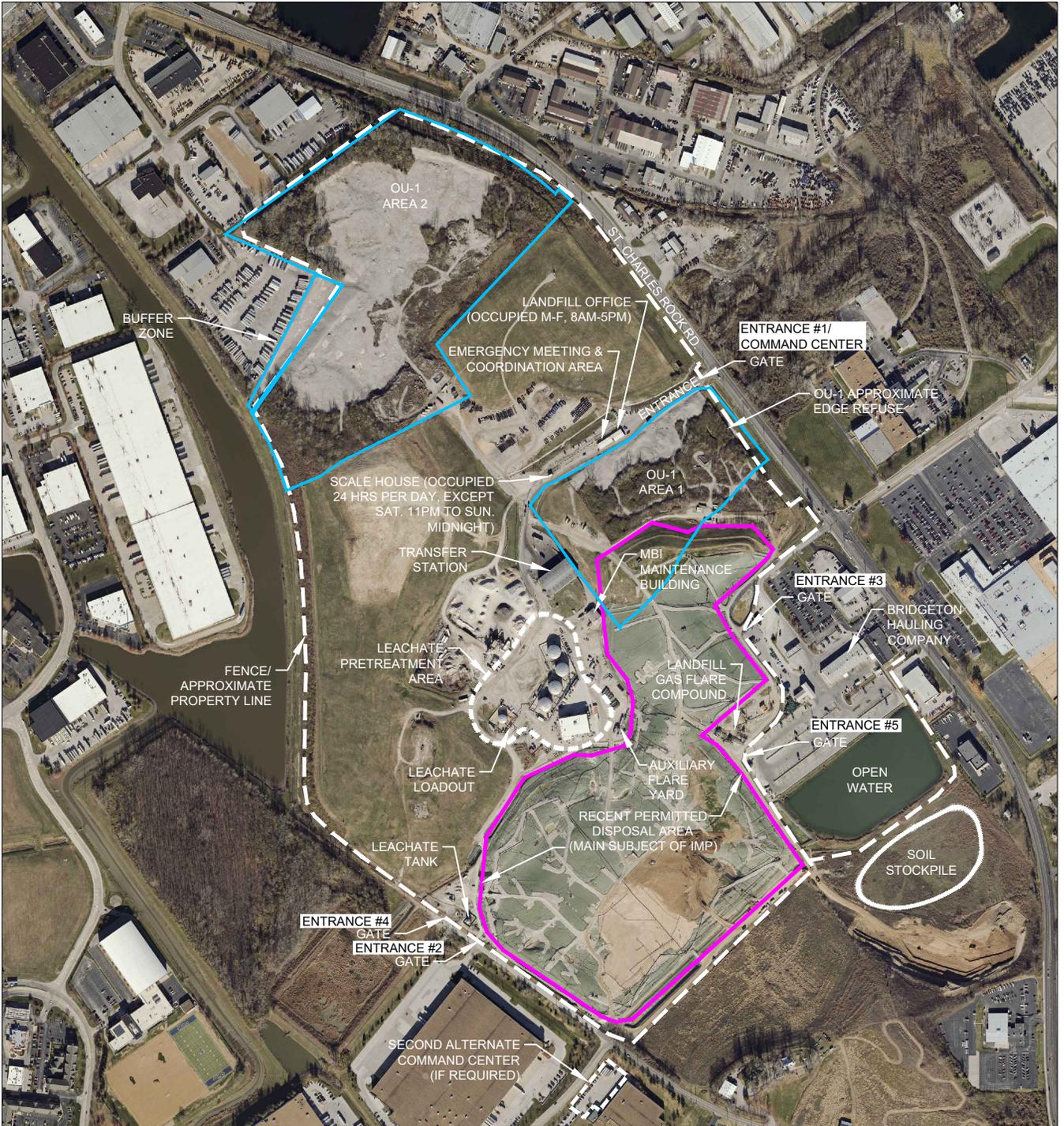
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314-656-4566 · 866-250-3679

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Figure 1

Facility Location

Bridgeton/West Lake Landfill
Incident Management Plan (IMP)



NOTE

1. A THIRD ALTERNATE COMMAND CENTER (IF REQUIRED) WOULD BE LOCATED AT THE PATTONVILLE FIRE PROTECTION DISTRICT ADMINISTRATIVE OFFICE AT 13900 ST. CHARLES ROCK ROAD.

REFERENCE

2018 TOPOGRAPHY AND BACKGROUND IMAGE PROVIDED BY COOPER AERIAL SURVEYS CO.



Figure 2
Facility Map

Bridgeton Landfill/West Lake Landfill
Incident Management Plan (IMP)



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LEGEND

BULK STORAGE CONTAINERS

- 1 ■ - ABOVEGROUND DIESEL FUEL STORAGE TANK - 6000 GAL
- 2 ■ - ABOVEGROUND DIESEL FUEL STORAGE TANK - 1000 GAL
- 3 ■ - ABOVEGROUND DIESEL FUEL STORAGE TANK - 1000 GAL
- 4 ■ - ABOVEGROUND DIESEL FUEL STORAGE TANK - 1000 GAL
- 5 ■ - ABOVEGROUND GASOLINE FUEL STORAGE TANKS - 29 GAL (3)
- 6 ■ - PROPANE STORAGE TANK - 500 GAL
- 7 ■ - MUNICIPAL CLASS-A FOAM

"QUADRANT" DESIGNATIONS

- (A) = SOUTH QUARRY - NE QUADRANT
- (B) = SOUTH QUARRY - SE QUADRANT
- (C) = SOUTH QUARRY - SW QUADRANT
- (D) = SOUTH QUARRY - NW QUADRANT
- (E) = NORTH QUARRY AREA

NOTE

1. A THIRD ALTERNATE COMMAND CENTER (IF REQUIRED) WOULD BE LOCATED AT THE PATTONVILLE FIRE PROTECTION DISTRICT ADMINISTRATIVE OFFICE AT 13900 ST. CHARLES ROCK ROAD.



- - ON-SITE ALL-WEATHER ROADS AND STAGING AREAS ACCESSIBLE BY PUBLIC EMERGENCY RESPONSE
- - ON-SITE ALL-WEATHER ROADS ACCESSIBLE BY BRIDGETON LANDFILL EQUIPMENT
- ○ - EXISTING YARD HYDRANT AND FIRE HYDRANT
- - NATURAL GAS LINE
- - ABOVEGROUND ELECTRIC LINE
- - - - FENCE LINE
- - POWER SUPPLY PANEL

NOTE

1. BACKGROUND INFORMATION REFLECTED FROM EMSI DRAWING DATED APRIL 2016

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Figure 3
Fire Hydrant Locations
 Bridgeton Landfill/West Lake Landfill
 Incident Management Plan (IMP)



"QUADRANT" DESIGNATIONS

- (A) = SOUTH QUARRY - NE QUADRANT
- (B) = SOUTH QUARRY - SE QUADRANT
- (C) = SOUTH QUARRY - SW QUADRANT
- (D) = SOUTH QUARRY - NW QUADRANT
- (E) = NORTH QUARRY AREA

LEGEND

- EXISTING YARD HYDRANT AND FIRE HYDRANT
- ON-SITE ALL-WEATHER ROADS AND STAGING AREAS ACCESSIBLE BY PUBLIC EMERGENCY RESPONSE
- ON-SITE ALL-WEATHER ROADS ACCESSIBLE BY BRIDGETON LANDFILL EQUIPMENT
- FENCE LINE

NOTE

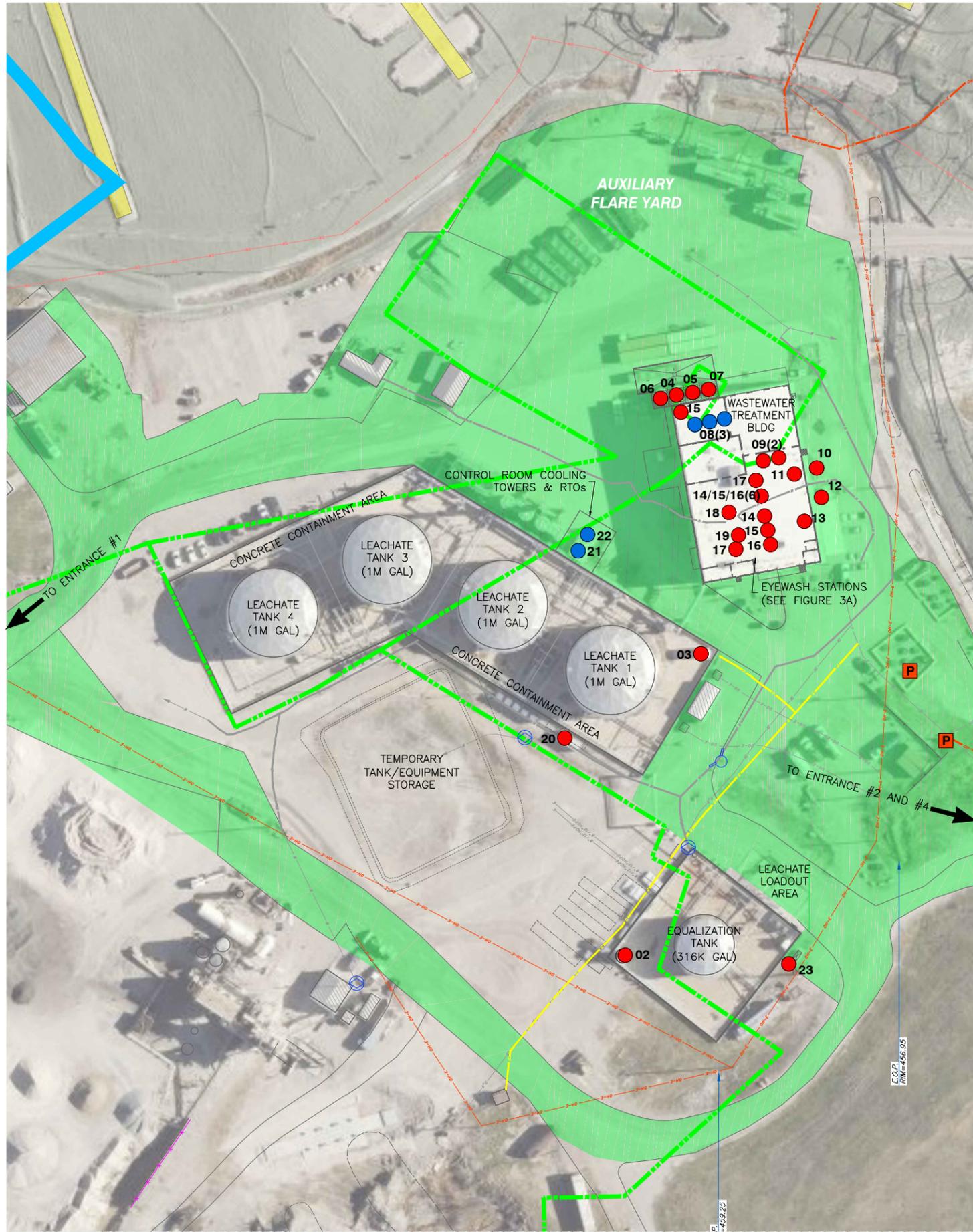
1. A THIRD ALTERNATE COMMAND CENTER (IF REQUIRED) WOULD BE LOCATED AT THE PATTONVILLE FIRE PROTECTION DISTRICT ADMINISTRATIVE OFFICE AT 13900 ST. CHARLES ROCK ROAD.
2. BACKGROUND INFORMATION REFLECTED FROM EMSI DRAWING DATED APRIL 2016

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Figure 3A
Emergency Locator Map
 Bridgeton Landfill/West Lake Landfill
 Incident Management Plan (IMP)

P:\2016\161163-723-CADD\DWG\CIV03 IMP Figures\IMP Figs April 2017-IMP Figs April 2017.dwg

LEACHATE TREATMENT AREA



LEGEND

BULK STORAGE CONTAINERS

- 02 ● - IDLE - 6,000 GAL
- 03 ● - IDLE - 6,000 GAL
- 04 ● - SODIUM HYDROXIDE (CAUSTIC) - 6,000 GAL
- 05 ● - 50% SODIUM HYDROXIDE (CAUSTIC) - 6,000 GAL
- 06 ● - SODIUM NITRATE - 6,000 GAL
- 07 ● - ALUMINUM CHLOROHYDRATE - 6,000 GAL
- 08 ● - CITRIC ACID DRUM - 55 GAL
- 09 ● - ANTIFOAM TOTE - 270 GAL
- 10 ● - NAC03 SILO - 49 TONS
- 11 ● - NAC03 MIX TANK - 1,000 GAL
- 12 ● - CO2 STORAGE TANK - 50 TONS
- 13 ● - NACL MAKE-UP TANK - 1.9 TONS
- 14 ● - AMMONIUM NITRATE TOTE - 270 GAL
- 15 ● - ANTI-SCALANT TOTE - 270 GAL
- 16 ● - H3PO4 TOTE - 270 GAL

- 17 ● - CATIONIC POLYMER TOTE - 270 GAL
- 18 ● - SODIUM CHLORIDE SUPER SAC - 2000 LBS
- 19 ● - CATIONIC POLYMER STORAGE TANK - 850 GAL
- 20 ● - ANTIFOAM STORAGE TANK - 1,200 GAL
- 21 ● - BIOCIDES (BROMINE & SODIUM HYPOCHLORITE/HYDROXIDE) - 55 GAL
- 22 ● - CORROSION/SCALE INHIBITOR - 55 GAL
- 23 ● - HYDRITE 3120 SUPPRESSOR - 330 GAL

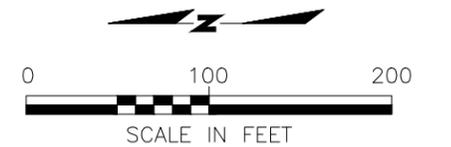
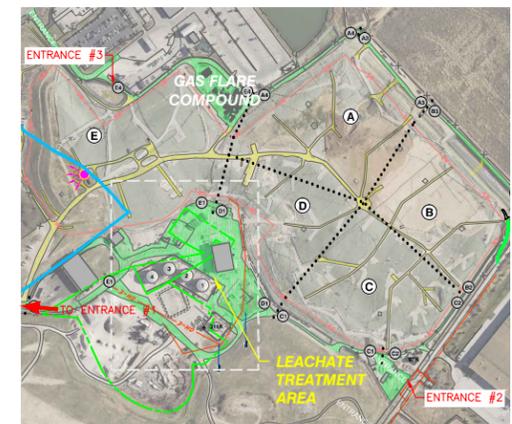
GENERAL LEGEND

- ON-SITE ALL-WEATHER ROADS AND STAGING AREAS ACCESSIBLE BY PUBLIC EMERGENCY RESPONSE
- ON-SITE ALL-WEATHER ROADS ACCESSIBLE BY BRIDGETON LANDFILL EQUIPMENT
- NATURAL GAS LINE
- ELECTRIC LINE
- FENCE LINE
- POWER SUPPLY PANEL
- 55 GALLON CONTAINER
- BULK CONTAINER (>55 GAL)

NOTES

1. A THIRD ALTERNATE COMMAND CENTER (IF REQUIRED) WOULD BE LOCATED AT THE PATTONVILLE FIRE PROTECTION DISTRICT ADMINISTRATIVE OFFICE AT 13900 ST. CHARLES ROCK ROAD.
2. THE LEACHATE TREATMENT AREA DEPICTED DOES CONTAIN 100 LB PROPANE FUEL TANKS AND 500 GAL DIESEL FUEL TANKS (SEE FIGURE 3 FOR MORE DETAILS).
3. BACKGROUND INFORMATION REFLECTED FROM EMSI DRAWING DATED APRIL 2016

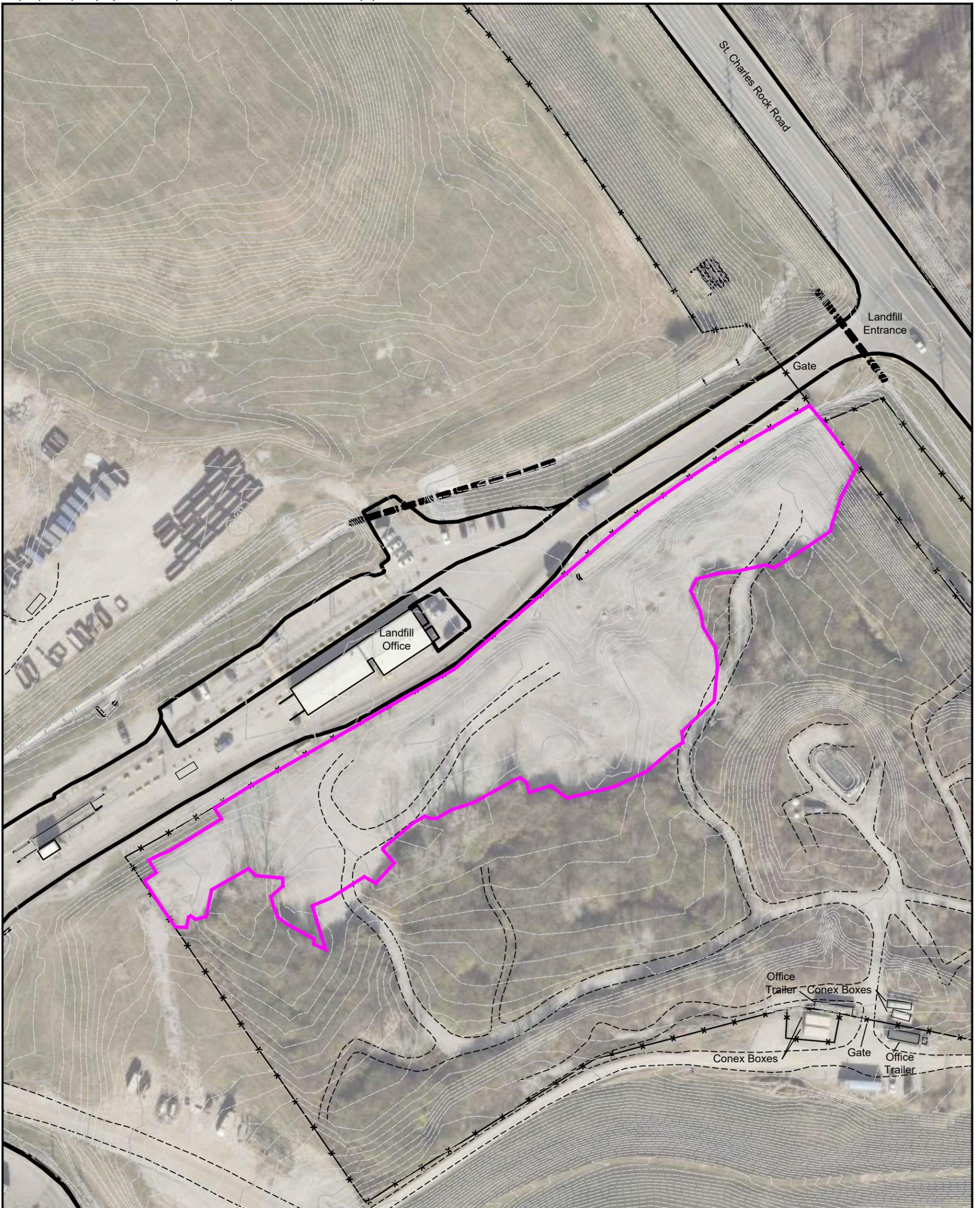
KEY



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Figure 4
Chemical Storage Areas
 Bridgeton Landfill/West Lake Landfill
 Incident Management Plan (IMP)

P:\2016\163-723-CADD\DWG\C03 IMP Figures\IMP Figs April 2017\163723-IMP Figs April 2017.dwg



LEGEND

- Edge of 2 Inch minus Non-Combustible Cover
- x - x - x - Fence
- - - - - Gravel Road

Notes:

- 2018 Topography And Background Image Provided By Cooper Aerial Surveys Co.
- All Elevations are Above Mean Sea Level (amsl)

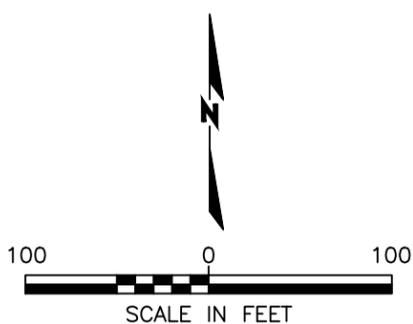


Figure 5
Final Extent of NCC and Site Features
Area 1

Bridgeton Landfill/West Lake Landfill
 Incident Management Plan (IMP)



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LEGEND

- Edge of 2 Inch minus Non-Combustible Cover
- x - x - x - Fence
- - - - - Gravel Road
- Buffer Zone

Notes:

- 2018 Topography And Background Image Provided by Cooper Aerial Surveys Co.
- All Elevations are Above Mean Sea Level (amsl)

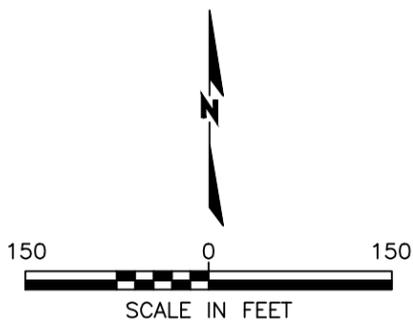
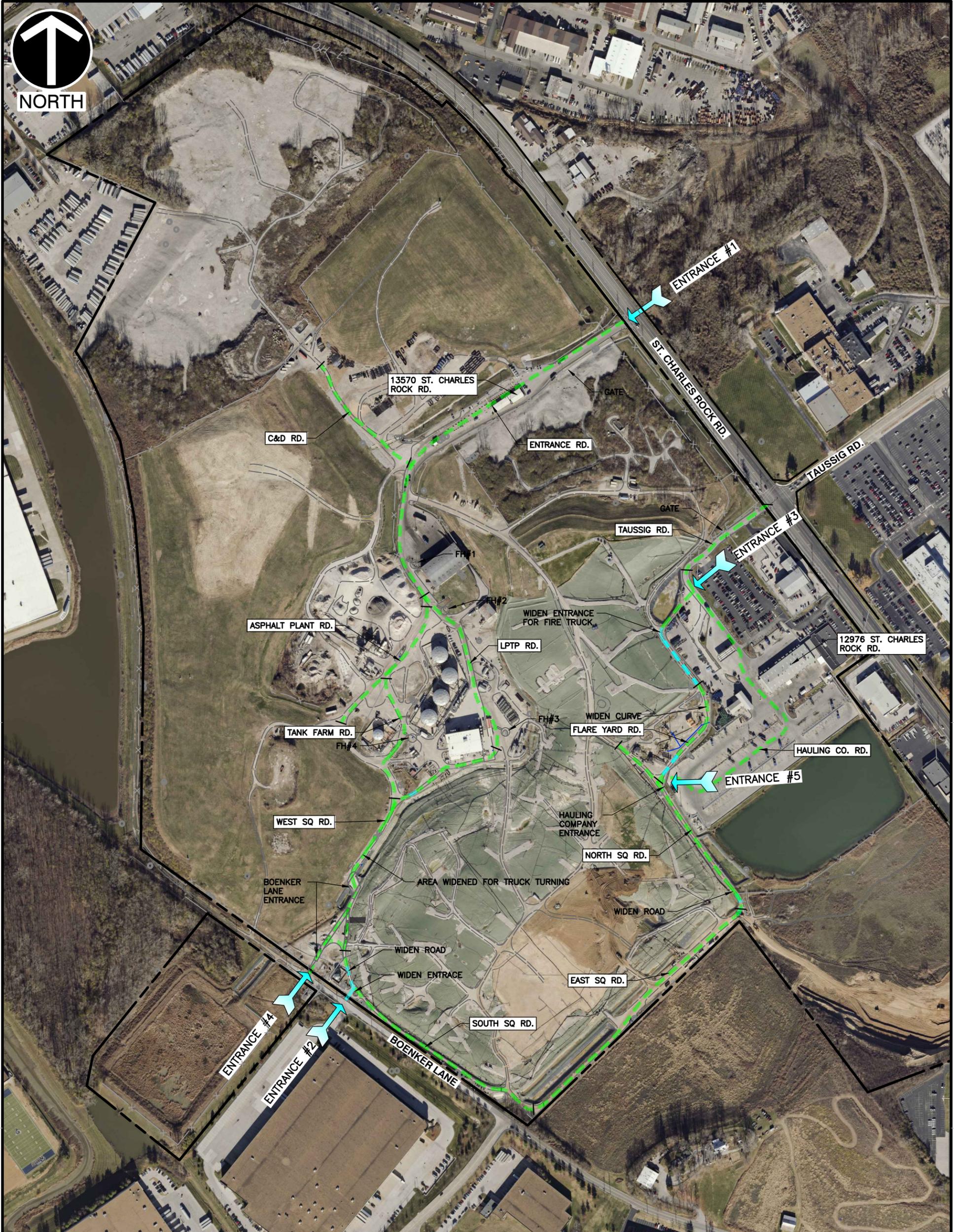


Figure 6
**Final Extent of NCC and Site Features
 Area 2**

Bridgeton Landfill/West Lake Landfill
 Incident Management Plan (IMP)

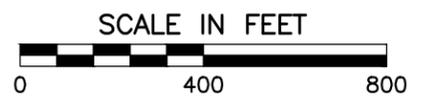


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LEGEND

- NATIVE ROADS - TRACTOR TRAILER & FIRE TRUCK PASSABLE
- NATIVE ROADS - FIRE TRUCK PASSABLE
- FIRE HYDRANT



REFERENCE

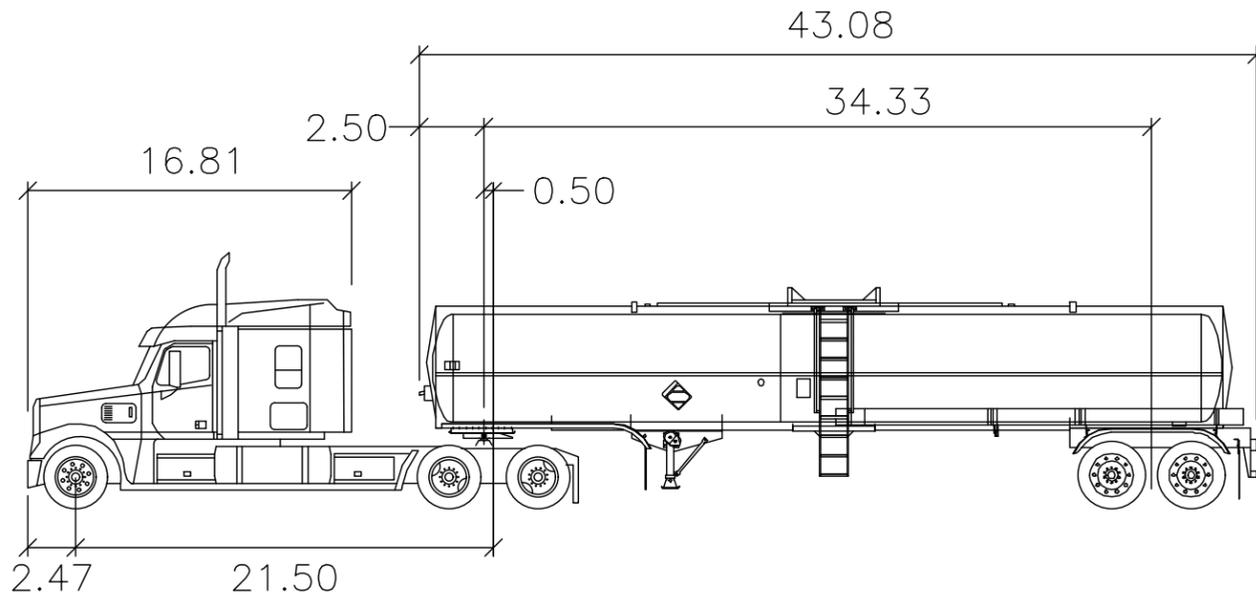
BASE MAP IMAGE FROM:
COOPER AERIAL 12/2018



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Figure 7
Emergency Access Road Plan
Proposed Conditions
Bridgeton Landfill/West Lake Landfill
Incident Management Plan (IMP)

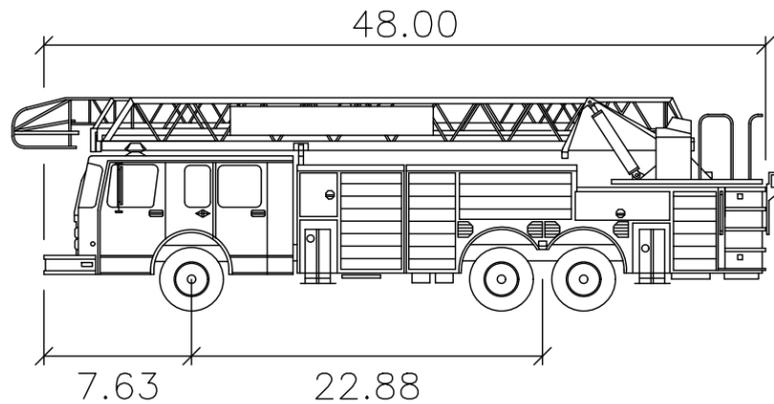


Brenner Tank Trailer

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.00	Steering Angle	: 40.1
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.00		

BRENNER TANKER TRUCK
TRACTOR: INTERNATIONAL TRUCK AND ENGINE CORPORATION
INTERNATIONAL 9900ix (JULY 16, 2008)
TRAILER: BAKER CORP. BRENNER TANKER TRAILER (JUNE 9, 2008)



Pattonville—Fire Truck

feet

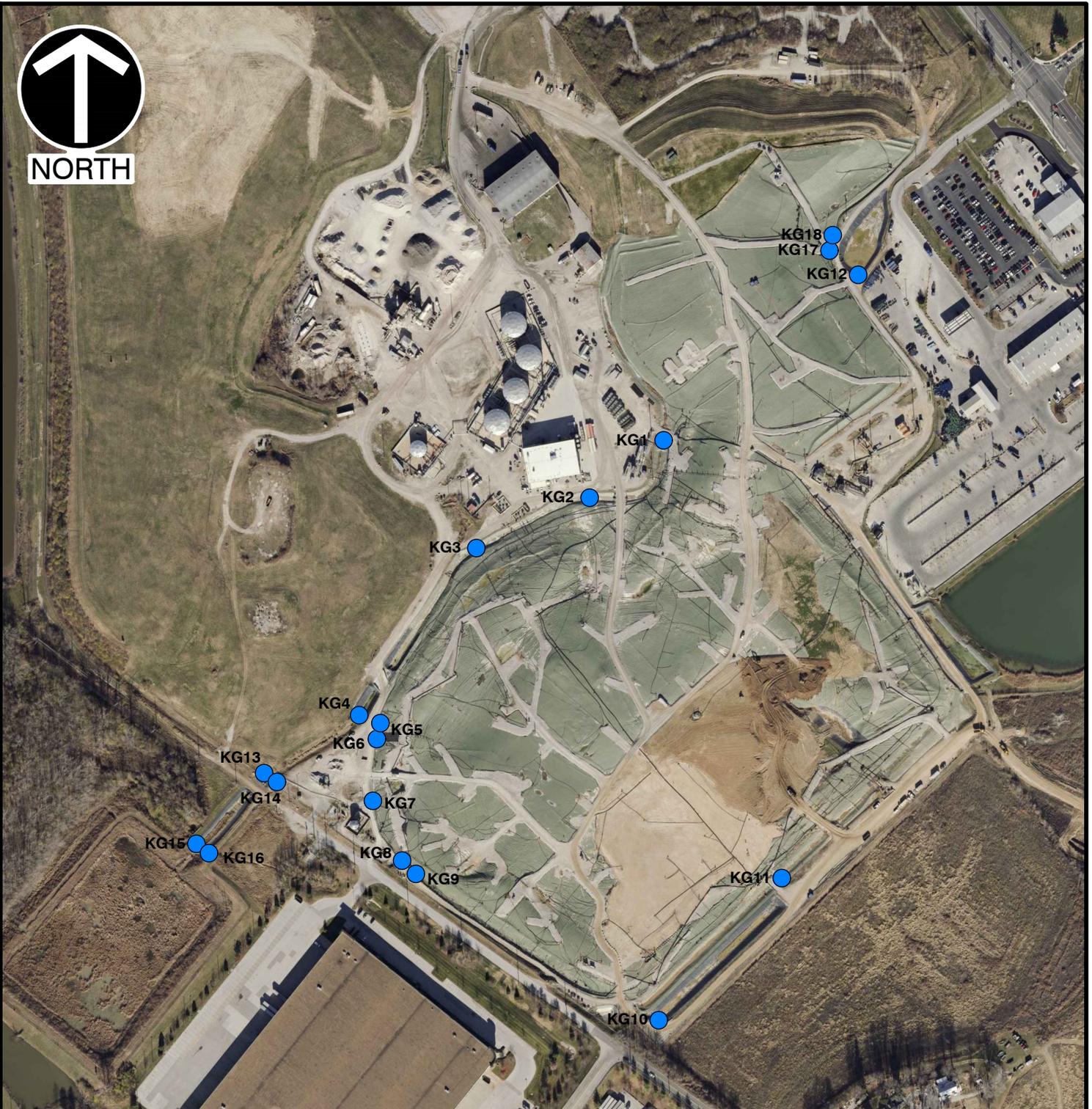
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 33.3

PATTONVILLE FIRE DISTRICT - FIRE TRUCK
PIERCE MANUFACTURING, INC. - 95FT. MIDMOUNT AERIAL
PLATFORM AND BODY ASSY (MMP95A) 300 GALLON WATER TANK

 Civil & Environmental Consultants, Inc. 4848 Park 370 Blvd., Suite F - Hazelwood, MO 63042 314-656-4566 · 866-250-3679 www.cecinc.com	REPUBLIC SERVICES, INC. BRIDGETON LANDFILL 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	
	EMERGENCY ACCESS ROAD PLAN TRUCK SCHEMATICS	
DRAWN BY: MAK DATE: AUG. 2017	CHECKED BY: DRK DWG SCALE: NA	APPROVED BY: DRAFT PROJECT NO: 163-723
		FIGURE NO.: 8



P:\2016\163-723\CADD\DWG\C004\Storm Water Figure 163723-CV04-KnifeGates.dwg\FIGURE 9\LS:1/8/2018 - matt.knuth) - LP: 1/8/2018 4:16 PM

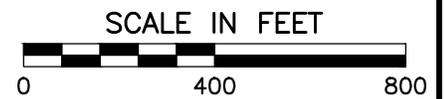


LEGEND

KGXX ● - KNIFE GATE VALVE

REFERENCE

- 1. BACKGROUND AERIAL PHOTOGRAPH FROM 2018 COOPER AERIAL SURVEY.



*HAND SIGNATURE ON FILE



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Figure 9

Knife Gate Valve Location Map

Bridgeton Landfill/West Lake Landfill
Incident Management Plan (IMP)

ATTACHMENT A

RESPONSE AND INCIDENT STRATEGIES FOR POTENTIAL INCIDENTS

- Incoming Call to 911 / EPA Spill Line / MDNR Spill Line Regarding Bridgeton / West Lake Landfills
- Bridgeton Landfill Surface Fire (vegetation or landfill fire)
- Bridgeton Landfill Personal Injury – Man Down / Personnel Contamination
- Bridgeton Landfill Sudden Waste Movement
- Bridgeton Landfill Leachate Release
- West Lake Landfill OU-1 Surface Fire (vegetation or landfill fire)
- West Lake Landfill OU-1 Personal Injury – Man Down / Personnel Contamination
- West Lake Landfill Sudden Waste Movement

INCIDENT – INCOMING CALL TO 911 / EPA SPILL LINE / MDNR SPILL LINE REGARDING BRIDGETON / WEST LAKE LANDFILLS

INITIAL ASSESSMENT (by 911 / Spill Line Operators)

Incoming Call Regarding Bridgeton / West Lake Landfill

1. 911, EPA spill line, and/or MDNR spill line operator receives an emergency call regarding Bridgeton or West Lake Landfill

RESPONSE

1. Call Bridgeton Landfill management staff to notify them of the situation

CONTACT INFORMATION

Bridgeton Landfill

- Facility Emergency Coordinator Erin Fanning cell: 209-227-9531
- Alternate Emergency Facility Coordinator Michael Lambrich cell: 314-683-3921
- Alternate Emergency Facility Coordinator Matthew Stewart cell: 314-477-6140
- Alternate Emergency Facility Coordinator Dana Sincox cell: 314-313-0838

INCIDENT – BRIDGETON LANDFILL SURFACE FIRE

INITIAL ASSESSMENT (by Facility Emergency Coordinator)

- Level 0***
- Small affected area, or
 - Minor smoke plume, and
 - Equipment and personnel on-site sufficient to resolve incident.

RESPONSE

1. Notify on-site personnel
2. Notify MDNR SWMP, MDNR DHSS, St. Louis Co. DoH, and EPA R7
3. Notify Pattonville FD On-Duty Battalion Chief and Assistant Chief
4. Notify Robertson FD Assistant Fire Chief
5. Notify Bridgeton PD
6. Coordinate extinguishment (use heavy equipment to smother with dirt or extinguish with water truck spray)
7. Implement measures to control run-on and run-off from any areas where water is applied
8. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
9. Monitor continuously for one hour to ensure fire has been extinguished
10. Assess potential damage to systems and make repairs

CONTACT INFORMATION

- Pattonville FD
- On-Duty Battalion Chief: 314-393-4802
 - Assistant Chief: 314-393-4807
- Robertson FD
- Assistant Fire Chief: 314-575-5011
- Bridgeton PD
- Chief Hood: 314-420-9112
 - Major Mossotti: 314-602-3632

- MDNR SWMP
- Chris Nagel cell: 573-750-5401 or
 - Mike Parris cell: 573-680-6669
- MDNR DHSS
- Keith Henke: 573-645-8943
- St. Louis Co. DoH
- Mark Milward cell: 314-520-1373
- EPA Region 7
- Tom Mahler cell: 816-604-0546

- Level 1***
- After normal business hours, or
 - Insufficient on-site resources, or
 - Flame/smoke visible from off-site, or
 - Large affected area

RESPONSE

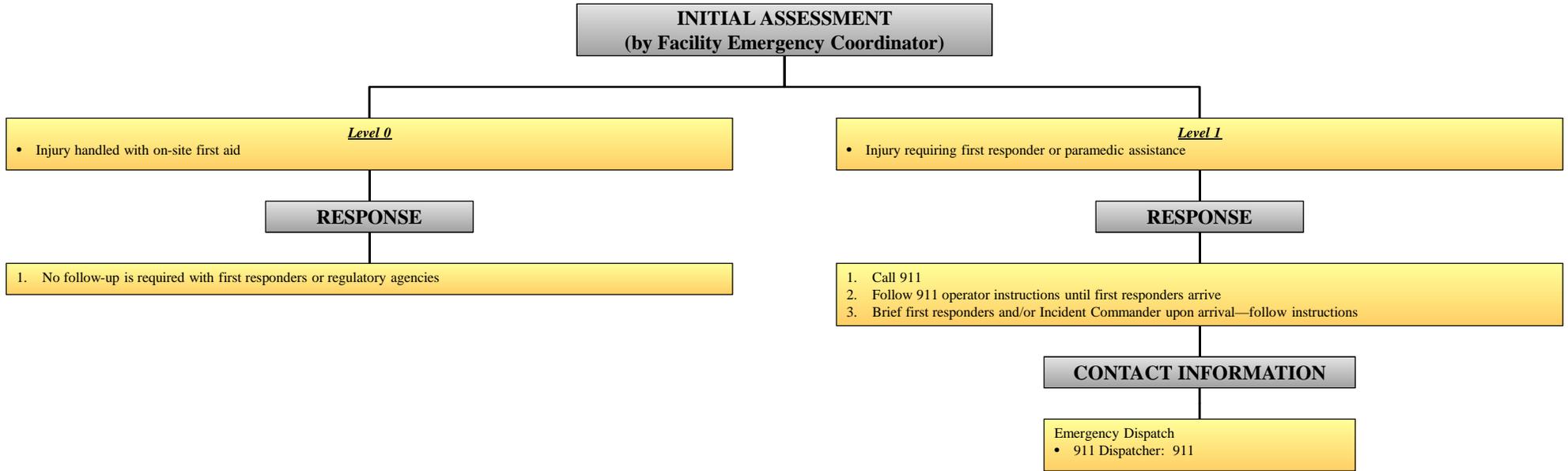
1. Notify on-site personnel
2. Call 911
3. Call Pattonville FD On-Duty Battalion Chief and Assistant Chief
4. Call Robertson FD Assistant Fire Chief
5. Call Bridgeton PD
6. Notify MDNR SWMP, MDNR DHSS, St. Louis Co. DoH, and EPA R7
7. Suspend impacted, non-critical operations (unless such operation minimizes incident)
8. Coordinate extinguishment with Incident Commander
9. Implement measures to control run-on and run-off from any areas where water is applied
10. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
11. Monitor continuously for 48 hours to assure extinguishment
12. Assess potential damage to systems and make repairs
13. Resume regular operations with consent of Incident Commander

CONTACT INFORMATION

- Emergency Dispatch
- 911 Dispatcher: 911
- Pattonville FD
- On-Duty Battalion Chief: 314-393-4802
 - Assistant Chief: 314-393-4807
- Robertson FD
- Assistant Fire Chief: 314-575-5011
- Bridgeton PD
- Chief Hood: 314-420-9112
 - Major Mossotti: 314-602-3632

- MDNR SWMP
- Chris Nagel cell: 573-750-5401 or
 - Mike Parris cell: 573-680-6669
- MDNR DHSS
- Keith Henke: 573-645-8943
- St. Louis Co. DoH
- Mark Milward cell: 314-520-1373
- EPA Region 7
- Tom Mahler cell: 816-604-0546

INCIDENT – BRIDGETON LANDFILL PERSONAL INJURY MAN DOWN / PERSONNEL CONTAMINATION



INCIDENT – BRIDGETON LANDFILL SUDDEN WASTE MOVEMENT/EXPOSED WASTE

INITIAL ASSESSMENT (by Facility Emergency Coordinator)

- Level 0
- Movement within limits of temporary cap or
 - Little or no exposed waste, and
 - Minor odor release

RESPONSE

1. Place soil at the toe of any areas where waste movement occurs in order to stabilize the area(s)
2. Turn off gas extraction wells within 200 feet of area of concern
3. Lightly cover tension cracks with clean, clayey soil
4. Notify MDNR SWMP, MDNR DHSS, St. Louis Co. DoH, and EPA R7
5. Notify Pattonville FD On-duty Battalion Chief and Assistant Chief
6. Notify Robertson FD Assistant Fire Chief
7. Notify Bridgeton PD
8. Inspect infrastructure for any damage, leaks or failures
9. Implement measures to control run-on and run-off from any areas where waste materials are exposed
10. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
11. Monitor for one week; if no further movement, implement relocation of waste material and restoration

CONTACT INFORMATION

- Pattonville FD
- On-Duty Battalion Chief: 314-393-4802
 - Assistant Chief: 314-393-4807
- Robertson FD
- Assistant Fire Chief: 314-575-5011
- Bridgeton PD
- Chief Hood: 314-420-9112
 - Major Mossotti: 314-602-3632

- MDNR SWMP
- Chris Nagel cell: 573-750-5401 or
 - Mike Parris cell: 573-680-6669
- MDNR DHSS
- Keith Henke: 573-645-8943
- St. Louis Co. DoH
- Mark Milward cell: 314-520-1373
- EPA Region 7
- Tom Mahler cell: 816-604-0546

- Level 1
- Massive movement, slope failure, erosion, flooding, tornado or other event that exposes waste material
 - Large exposure of waste material or
 - Hot (steaming) or burning waste exposed
 - Extensive release of gas and/or odors

RESPONSE

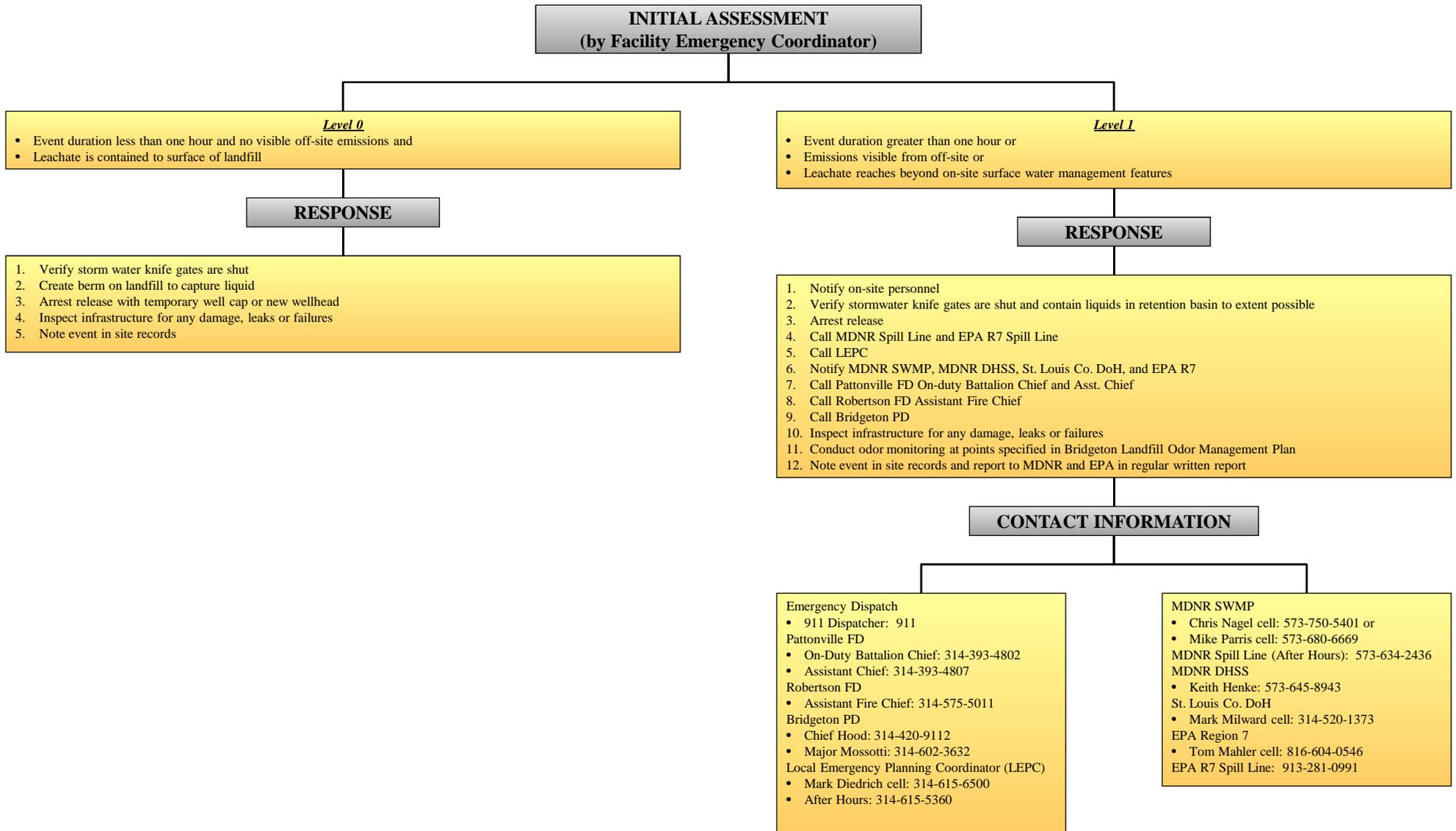
1. Notify on-site personnel
2. Turn off gas extraction wells within 500 feet of area of concern
3. Call Pattonville FD On-Duty Battalion Chief and Assistant Chief
4. Call Robertson FD Assistant Fire Chief
5. Call Bridgeton PD
6. Call EPA R7 Spill Line
7. Notify MDNR SWMP, MDNR DHSS, St. Louis Co. DoH, and EPA R7
8. Place soil at the toe of any areas where waste movement occurs in order to stabilize the area(s)
9. Implement measures to control run-on and run-off from any areas where waste materials are exposed
10. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
11. Lightly cover exposed waste with clean, clayey soil while buttressing toe at direction of professional engineer
12. Monitor for one month; if no further movement, implement relocation of waste material and restoration

CONTACT INFORMATION

- Emergency Dispatch
- 911 Dispatcher: 911
- Pattonville FD
- On-Duty Battalion Chief: 314-393-4802
 - Assistant Chief: 314-393-4807
- Robertson FD
- Assistant Fire Chief: 314-575-5011
- Bridgeton PD
- Chief Hood: 314-420-9112
 - Major Mossotti: 314-602-3632

- MDNR SWMP
- Chris Nagel cell: 573-750-5401 or
 - Mike Parris cell: 573-680-6669
- MDNR DHSS
- Keith Henke: 573-645-8943
- St. Louis Co. DoH
- Mark Milward cell: 314-520-1373
- EPA Region 7
- Tom Mahler cell: 816-604-0546
- EPA R7 Spill Line: 913-281-0991

INCIDENT – BRIDGETON LANDFILL LEACHATE RELEASE



INCIDENT – WEST LAKE LANDFILL OU-1 SURFACE FIRE

INITIAL ASSESSMENT (by Facility Emergency Coordinator)

Level 0

- Small affected area, or
- Minor smoke plume, and
- Equipment and personnel on-site sufficient to resolve incident.

RESPONSE

1. Notify on-site personnel
2. Notify EPA R7, OU-1 personnel, MDNR SWMP, MDNR DHSS, and St. Louis Co. DoH
3. Notify Pattonville FD On-Duty Battalion Chief and Assistant Chief
4. Notify Robertson FD Assistant Fire Chief
5. Notify Bridgeton PD
6. Notify EPA R7 Spill Line
7. Coordinate extinguishment (use heavy equipment to smother with dirt or extinguish with water truck spray)
8. Implement measures to control run-on and run-off from any areas where water is applied
9. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
10. Monitor continuously for one hour to ensure fire has been extinguished
11. Assess potential damage to systems and make repairs

CONTACT INFORMATION

Pattonville FD

- On-Duty Battalion Chief: 314-393-4802
- Assistant Chief: 314-393-4807

Robertson FD

- Assistant Fire Chief: 314-575-5011

Bridgeton PD

- Chief Hood: 314-420-9112
- Major Mossotti: 314-602-3632

MDNR SWMP

- Chris Nagel cell: 573-750-5401 or
- Mike Parris cell: 573-680-6669

MDNR DHSS

- Keith Henke: 573-645-8943

St. Louis Co. DoH

- Mark Milward cell: 314-520-1373

EPA Region 7

- Tom Mahler cell: 816-604-0546

EPA R7 Spill Line: 913-281-0991

OU-1 Personnel

- Paul Rosasco cell: 303-808-7227
- Dan Feezor cell: 217-836-8842
- Bill Abernathy cell: 314-502-1299
- Jon Wilkinson cell: 636-578-8635

Level 1

- After normal business hours, or
- Insufficient on-site resources, or
- Flame/smoke visible from off-site, or
- Large affected area

RESPONSE

1. Notify on-site personnel
2. Call 911
3. Call Pattonville FD On-Duty Battalion Chief and Assistant Chief
4. Call Robertson FD Assistant Fire Chief
5. Call Bridgeton PD
6. Call EPA R7 Spill Line
7. Notify EPA R7, OU-1 personnel, MDNR SWMP, MDNR DHSS, and St. Louis Co. DoH
8. Suspend impacted, non-critical operations (unless such operation minimizes incident)
9. Coordinate extinguishment with Incident Commander
10. Implement measures to control run-on and run-off from any areas where water is applied
11. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
12. Monitor continuously for 48 hours to assure extinguishment
13. Assess potential damage to systems and make repairs
14. Resume regular operations with consent of Incident Commander

CONTACT INFORMATION

Emergency Dispatch

- 911 Dispatcher: 911

Pattonville FD

- On-Duty Battalion Chief: 314-393-4802
- Assistant Chief: 314-393-4807

Robertson FD

- Assistant Fire Chief: 314-575-5011

Bridgeton PD

- Chief Hood: 314-420-9112
- Major Mossotti: 314-602-3632

MDNR SWMP

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MDNR DHSS

- Keith Henke: 573-645-8943

St. Louis Co. DoH

- Mark Milward cell: 314-520-1373

EPA Region 7

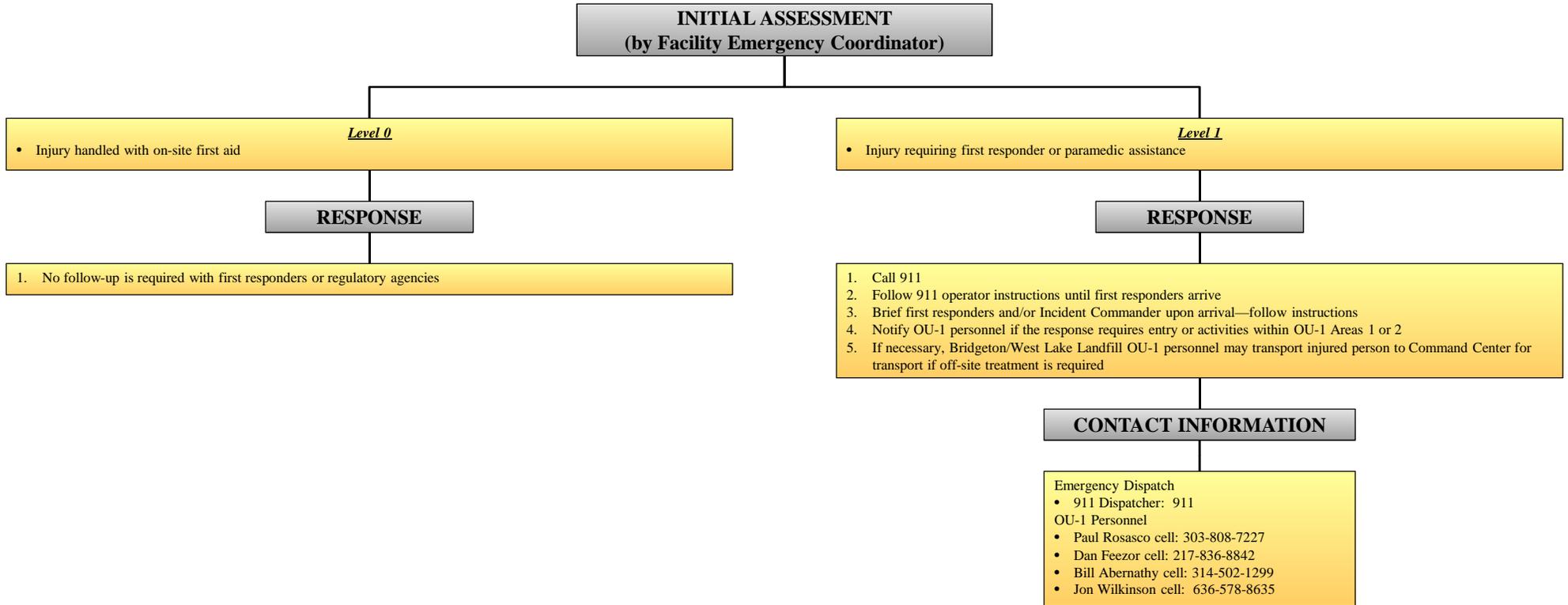
- Tom Mahler cell: 816-604-0546

EPA R7 Spill Line: 913-281-0991

OU-1 Personnel

- Paul Rosasco cell: 303-808-7227
- Dan Feezor cell: 217-836-8842
- Bill Abernathy cell: 314-502-1299
- Jon Wilkinson cell: 636-578-8635

INCIDENT – WEST LAKE LANDFILL OU-1 PERSONAL INJURY MAN DOWN / PERSONNEL CONTAMINATION



INCIDENT – WEST LAKE LANDFILL OU-1 SUDDEN WASTE MOVEMENT/EXPOSED WASTE

INITIAL ASSESSMENT (by Facility Emergency Coordinator)

- Level 0
- Movement within limits of temporary cap or
 - Little or no exposed waste, and
 - Minor odor release

RESPONSE

1. Place soil at the toe of any areas where waste movement occurs in order to stabilize the area(s)
2. Lightly cover tension cracks with clean, clayey soil
3. Notify EPA R7, OU-1 personnel, MDNR SWMP, MDNR DHSS, and St. Louis Co. DoH
4. Notify EPA Region 7 Spill Line
5. Notify Pattonville FD On-duty Battalion Chief and Assistant Chief
6. Notify Robertson FD Assistant Fire Chief
7. Notify Bridgeton PD
8. Inspect infrastructure for any damage, leaks or failures
9. Implement measures to control run-on and run-off from any areas where waste materials are exposed
10. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
11. Monitor for one week; if no further movement, implement relocation of waste material and restoration

CONTACT INFORMATION

- Pattonville FD
- On-Duty Battalion Chief: 314-393-4802
 - Assistant Chief: 314-393-4807
- Robertson FD
- Assistant Fire Chief: 314-575-5011
- Bridgeton PD
- Chief Hood: 314-420-9112
 - Major Mossotti: 314-602-3632

- MDNR SWMP
- Chris Nagel cell: 573-750-5401 or
 - Mike Parris cell: 573-680-6669
- MDNR DHSS
- Keith Henke: 573-645-8943
- St. Louis Co. DoH
- Mark Milward cell: 314-520-1373
- EPA Region 7
- Tom Mahler cell: 816-604-0546
- EPA R7 Spill Line: 913-281-0991
- OU-1 Personnel
- Paul Rosasco cell: 303-808-7227
 - Dan Feezor cell: 217-836-8842
 - Bill Abernathy cell: 314-502-1299
 - Jon Wilkinson cell: 636-578-8635

- Level 1
- Massive movement, slope failure, erosion, flooding, tornado or other event that exposes waste material
 - Large exposure of waste material or
 - Hot (steaming) or burning waste exposed
 - Extensive release of gas and/or odors

RESPONSE

1. Notify on-site personnel
2. Call 911
3. Call Pattonville FD On-Duty Battalion Chief and Assistant Chief
4. Call Robertson FD Assistant Fire Chief
5. Call Bridgeton PD
6. Notify EPA Region 7 Spill Line
7. Notify EPA R7, OU-1 personnel, MDNR SWMP, MDNR DHSS, and St. Louis Co. DoH
8. Place soil at the toe of any areas where waste movement occurs in order to stabilize the area(s)
9. Implement measures to control run-on and run-off from any areas where waste materials are exposed
10. Conduct odor monitoring at locations specified in Bridgeton Landfill Odor Management Plan
11. Lightly cover exposed waste with clean, clayey soil while buttressing toe at direction of professional engineer
12. Monitor for one month; if no further movement, implement relocation of waste material and restoration

CONTACT INFORMATION

- Emergency Dispatch
- 911 Dispatcher: 911
- Pattonville FD
- On-Duty Battalion Chief: 314-393-4802
 - Assistant Chief: 314-393-4807
- Robertson FD
- Assistant Fire Chief: 314-575-5011
- Bridgeton PD
- Chief Hood: 314-420-9112
 - Major Mossotti: 314-602-3632

- MDNR SWMP
- Chris Nagel cell: 573-750-5401 or
 - Mike Parris cell: 573-680-6669
- MDNR DHSS
- Keith Henke: 573-645-8943
- St. Louis Co. DoH
- Mark Milward cell: 314-520-1373
- EPA Region 7
- Tom Mahler cell: 816-604-0546
- EPA R7 Spill Line: 913-281-0991
- OU-1 Personnel
- Paul Rosasco cell: 303-808-7227
 - Dan Feezor cell: 217-836-8842
 - Bill Abernathy cell: 314-502-1299
 - Jon Wilkinson cell: 636-578-8635

ATTACHMENT B

**FACILITY EMERGENCY COORDINATOR CHECKLIST / EMERGENCY RESPONDER
COMMUNICATION**

BRIDGETON LANDFILL

Incident Management Plan

FACILITY EMERGENCY COORDINATOR CHECKLIST / EMERGENCY RESPONDER COMMUNICATION

- a. Make initial classification and categorize incident
- b. Initiate proper response strategy (Section 5). For notifications, collect the following information and communicate it to notified parties:
 - Location of the incident (by Quadrant)
 - Gate location closest to the incident
 - Incident Type and Level (0 or 1)
- c. Account for facility personnel
- d. Assure appropriate access gates are open
- e. Determine if environmental release is occurring and contain
- f. Restore and resume normal operation

INCIDENT DETAIL

Date and Time of Incident: _____

Facility Coordinator: _____

Description of Incident: _____

Date and Time Resume Normal Activity: _____

ATTACHMENT C

SPILL PREVENTION AND RESPONSE FOR LEACHATE

Spill Prevention and Response for Leachate

Spill Prevention

Leachate is collected from collection wells sumps throughout the landfill. The leachate is piped to collection tanks either directly or via internal lift stations. There are currently 4 lift stations. Under normal operations, leachate is pumped to Tank 200, (the 316K gallon equalization tank) mixed and aerated and then transferred to the pre-treatment plant for treatment. Aeration Tank 307A can also be used as an equalization tank if Tank 200 is not used. Treated or partially treated leachate can be transferred to hauling trucks at the leachate load-out station if necessary. Table 1 lists the devices and practices in place to prevent spills of leachate.

Table 1: Spill Prevention Devices and Practices

Spill Prevention Devices and Practices	Tank 600	Tank 200 and Tanks 307A-D	Frac Tanks	Pumps and Lift Stations	Leachate Piping	Truck Load-out Station
SCADA level sensor	*	*		*	NA	NA
Minimum freeboard	*	*	*	*	NA	NA
High level alarm light	*	*		*	NA	NA
Overfill prevention feed shutoffs		*		*		
Bypass valves				*		
Secondary tank containment	*	*	*	*	NA	*
Underground dual containment piping	*	*	*	*	*	*
Pumps turned off during maintenance	*	*	*	*	*	*
Dry disconnect couplings	NA	NA	*	NA	*	
Drip pans			*		*	
Vac Truck available to clean containment	*	*	*	*	*	*
Daily inspection	*	*	*	*	*	* ¹

¹ Loading is monitored continuously by driver

Leachate Piping

- All leachate conveyance piping is dual containment with the exception of the pressurized well manifolds. This piping lies entirely on top of the flexible membrane line and is connected to dual containment sumps. Single walled piping may be used in temporary applications when necessary.
- There are no hose flanges or connections in piping. The only connections are at pumps, valves, and tanks, all of which have containment systems.
- During maintenance involving pipe disconnection, pipes are vacuumed with a vac truck as needed to avoid spillage: there are two vac trucks on site.

- Drip pans are used as needed during pipe disconnection while performing maintenance.

Leachate Pumps and Lift Station

- Each lift station is equipped with a high level alarm that activates a second pump to reduce volume quickly. If necessary, a second high-high level alarm triggers an automatic by-pass of the lift station and sends leachate directly to Tank 200.
- The lift stations and LCSs are equipped with SCADA monitoring and controls.
- Pumps and valve connections are within dual containment vaults.
- During maintenance, affected pumps are shut off and/or squeeze-off tools/valves are used to redirect leachate.
- After maintenance, leachate is removed from vaults and containments with a vacuum truck.

Tank 200 and Tanks 307A-D

- Tanks are in secondary containment systems capable of holding 110% of the capacity of the tank.
- Tank filling is conducted automatically and controlled from overflowing by level instruments connected to the SCADA system with high and high-high level alarms which turn off flow to the tanks and is also monitored by on-site staff, 24 hours per day, 7 days per week.
- Tank levels are monitored via SCADA equipment and on local digital readout.
- There is a 22' maximum fill height in Tank 200, when this level is exceeded the SCADA system displays a high level alarm on the computer screen.
- The SCADA system generates a phone text and/or email message to designated users when the high level point is reached.
- There is a local high level alarm light on the SCADA panel at the tank.
- All tanks and containments are inspected daily, the staff is on site 24 hours per day, 7 days per week.

Tank 600

- The tank has a secondary containment system capable of holding 110% of the capacity of the tank.
- There is an overflow bypass system to the secondary containment with a sump to the MSD lift station.
- Tank filling is conducted automatically and controlled from overflowing by level instruments connected to the SCADA system with high and high-high level alarms which turn off flow to the tank and is also monitored by on-site staff, 24 hours per day, 7 days per week.
- Tanks are monitored via SCADA equipment and on local digital readout.
- There is a 29' 1" maximum fill height; when the freeboard is exceeded the SCADA system displays a high level on-screen alarm.
- The SCADA system generates a phone text and/or email message to designated users when the high level point is reached.
- There is a local high level alarm light on the SCADA panel at the tank.

- All tanks and containments are inspected daily, the staff is on site 24 hours per day, 7 days per week.

Truck Load-out Station

- The load-out station has a concrete containment.
- The containment drains to a sump which pumps the liquid into Tank 200.
- Truck loading is monitored continuously by the truck driver in an overhead safety cage; engineering controls prevent the driver from leaving the area during filling.

Frac Tanks

- Each frac tank has an isolation/shut off valve.
- Each frac tank has a polyethylene containment system and on-site vac trucks are available to enable quick response to remove any spills.
- During piping changes or maintenance, pipes are vacuumed empty with a vac truck to avoid spillage.

ATTACHMENT D

ON-SITE FIRE HYDRANT FLOW TEST REPORTS

WATER FLOW TEST REPORT



359 Shockdrake Court Wentzville, MO 63385 Phone 636-332-9578 Email tonyh@hfsdesign.net

Residual Hydrant Readings	
Static pressure (psi)	140
Residual pressure (psi)	62

Flow Hydrant 1	
Pitot pressure (psi)	58
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	1278.308

Flow Hydrant 2	
Pitot pressure (psi)	0
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	0

Total Flow (gpm)	1278.308
------------------	----------

Minimum desired pressure (psi):	20
Expected flow at min. pressure (gpm):	1613.103

Minimum desired flow (gpm):	1500
Expected pressure at min. flow (psi):	35.11421

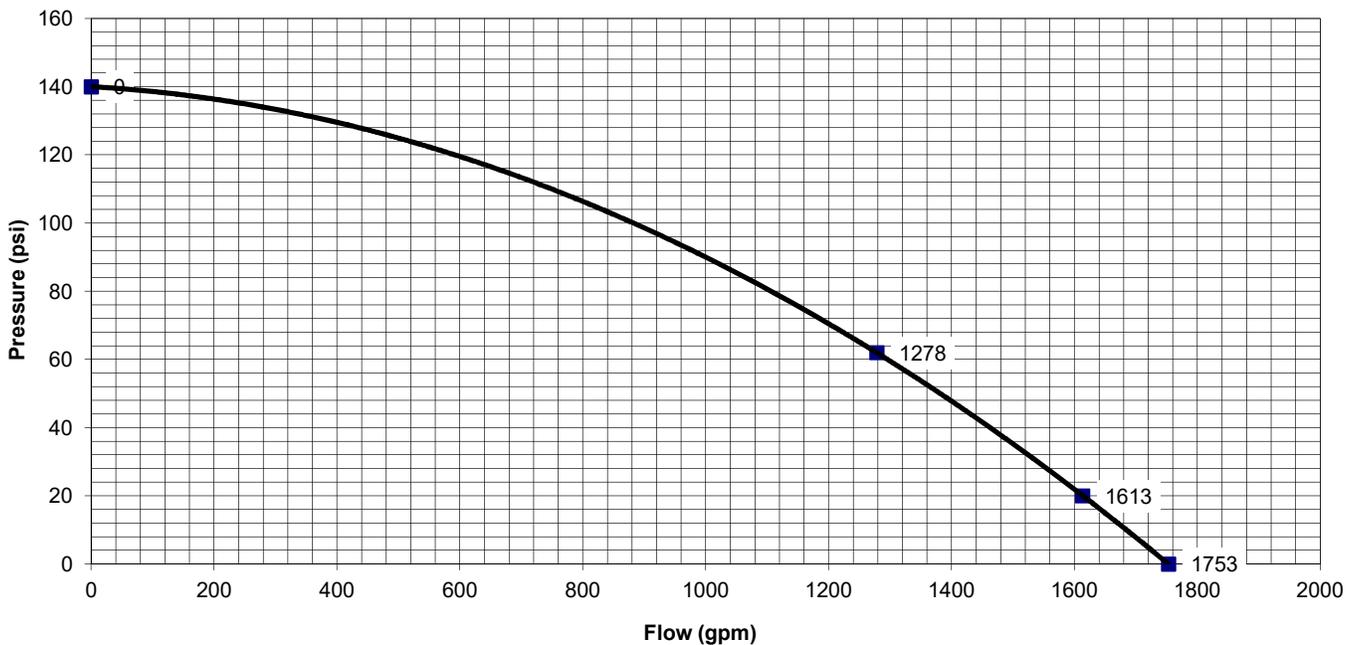
Expected flow at 0 psi:	1753.127
-------------------------	----------

Pumper Outlet Coefficients (NFPA 291 Table 4.8.2)	
Pitot reading (psi)	Coefficient
2	0.97
3	0.92
4	0.89
5	0.86
6	0.84
7+	0.83

Project Name: Bridgeton Landfill
 Project Address: 13570 St. Charles Rock Road
 Bridgeton, MO 63044

Flow Test No.: 1 of 4
 Date and Time: Wednesday August 9, 2017 at 8:00 a.m.
 Performed by: HFS Design
 Map provided: Yes

Notes: Fire hydrant #3 was gauged and fire hydrant #4 was flowed.



WATER FLOW TEST REPORT



359 Shockdrake Court Wentzville, MO 63385 Phone 636-332-9578 Email tonyh@hfsdesign.net

Residual Hydrant Readings	
Static pressure (psi)	140
Residual pressure (psi)	116

Flow Hydrant 1	
Pitot pressure (psi)	43
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	1100.666

Flow Hydrant 2	
Pitot pressure (psi)	0
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	0

Total Flow (gpm)	1100.666
------------------	----------

Minimum desired pressure (psi):	20
Expected flow at min. pressure (gpm):	2624.819

Minimum desired flow (gpm):	1500
Expected pressure at min. flow (psi):	97.42387

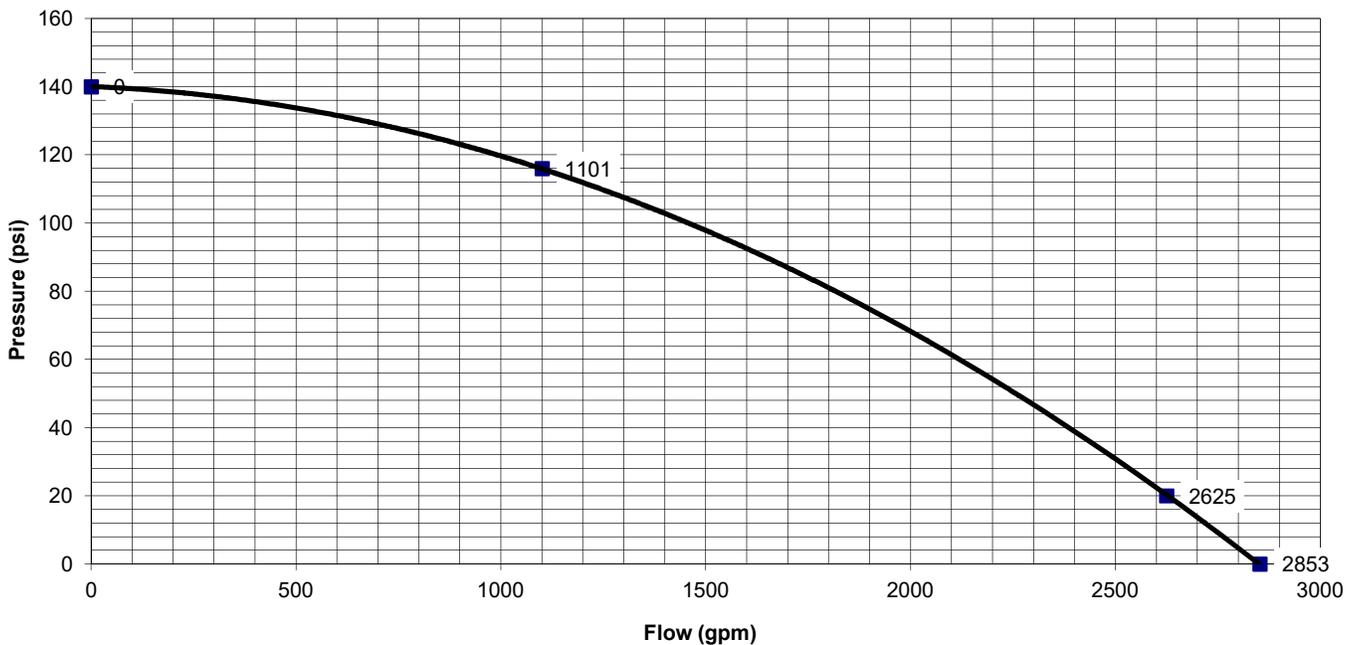
Expected flow at 0 psi:	2852.664
-------------------------	----------

Pumper Outlet Coefficients (NFPA 291 Table 4.8.2)	
Pitot reading (psi)	Coefficient
2	0.97
3	0.92
4	0.89
5	0.86
6	0.84
7+	0.83

Project Name: Bridgeton Landfill
 Project Address: 13570 St. Charles Rock Road
 Bridgeton, MO 63044

Flow Test No.: 2 of 4
 Date and Time: Wednesday August 9, 2017 at 8:15 a.m.
 Performed by: HFS Design
 Map provided: Yes

Notes: Fire hydrant #2 was gauged and fire hydrant #3 was flowed.



WATER FLOW TEST REPORT



359 Shockdrake Court Wentzville, MO 63385 Phone 636-332-9578 Email tonyh@hfsdesign.net

Residual Hydrant Readings	
Static pressure (psi)	140
Residual pressure (psi)	102

Flow Hydrant 1	
Pitot pressure (psi)	85
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	1547.501

Flow Hydrant 2	
Pitot pressure (psi)	0
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	0

Total Flow (gpm)	1547.501
------------------	----------

Minimum desired pressure (psi):	20
Expected flow at min. pressure (gpm):	2879.423

Minimum desired flow (gpm):	1500
Expected pressure at min. flow (psi):	104.1317

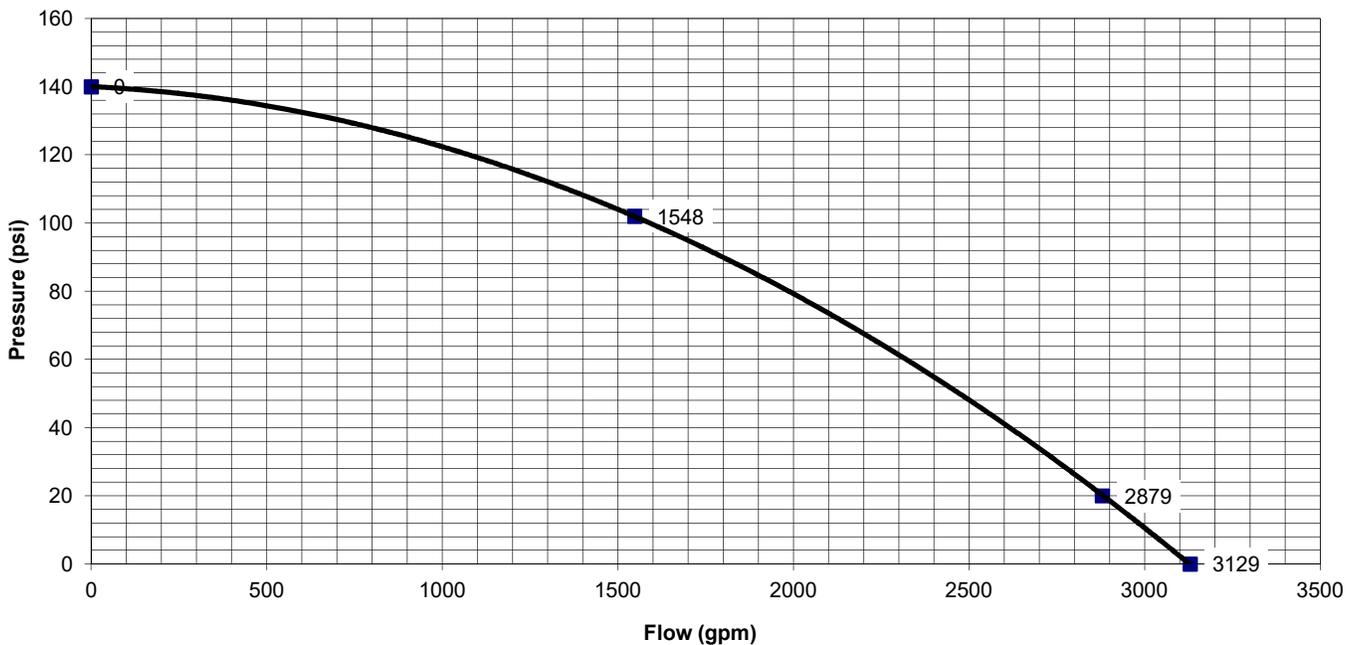
Expected flow at 0 psi:	3129.369
-------------------------	----------

Pumper Outlet Coefficients (NFPA 291 Table 4.8.2)	
Pitot reading (psi)	Coefficient
2	0.97
3	0.92
4	0.89
5	0.86
6	0.84
7+	0.83

Project Name: Bridgeton Landfill
 Project Address: 13570 St. Charles Rock Road
 Bridgeton, MO 63044

Flow Test No.: 3 of 4
 Date and Time: Wednesday August 9, 2017 at 8:30 a.m.
 Performed by: HFS Design
 Map provided: Yes

Notes: Fire hydrant #1 was gauged and fire hydrant #2 was flowed.



WATER FLOW TEST REPORT



359 Shockdrake Court Wentzville, MO 63385 Phone 636-332-9578 Email tonyh@hfsdesign.net

Residual Hydrant Readings	
Static pressure (psi)	140
Residual pressure (psi)	97

Flow Hydrant 1	
Pitot pressure (psi)	82
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	1519.946

Flow Hydrant 2	
Pitot pressure (psi)	0
Outlet diameter (in.)	2 1/2
Outlet coefficient	0.9
Pumper coefficient	1
Adjusted coefficient	0.9
Flow (gpm)	0

Total Flow (gpm)	1519.946
------------------	----------

Minimum desired pressure (psi):	20
Expected flow at min. pressure (gpm):	2645.533

Minimum desired flow (gpm):	1500
Expected pressure at min. flow (psi):	98.03914

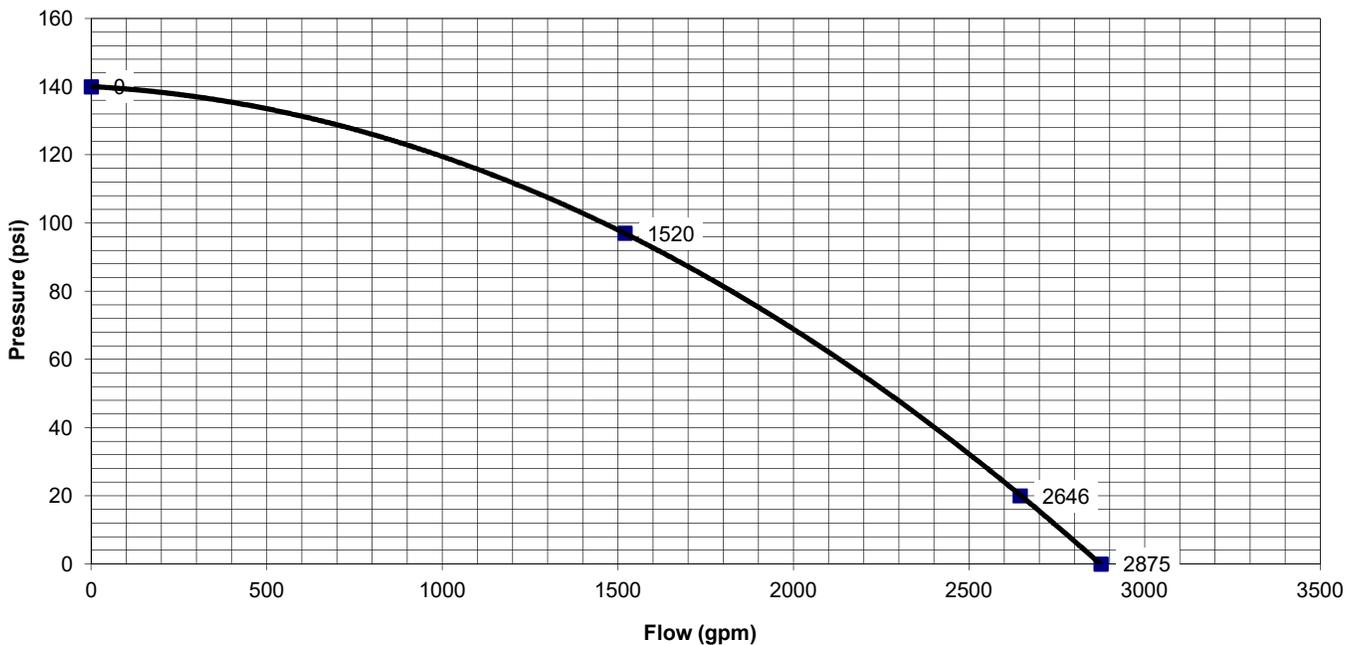
Expected flow at 0 psi:	2875.176
-------------------------	----------

Pumper Outlet Coefficients (NFPA 291 Table 4.8.2)	
Pitot reading (psi)	Coefficient
2	0.97
3	0.92
4	0.89
5	0.86
6	0.84
7+	0.83

Project Name: Bridgeton Landfill
 Project Address: 13570 St. Charles Rock Road
 Bridgeton, MO 63044

Flow Test No.: 4 of 4
 Date and Time: Wednesday August 9, 2017 at 8:45 a.m.
 Performed by: HFS Design
 Map provided: Yes

Notes: Fire hydrant #4 was gauged and fire hydrant #1 was flowed.



ATTACHMENT E

SDS

(Provided Separately)

Attachment 1 – Coronavirus Disease 2019 (COVID-19)



Coronavirus Disease 2019 (COVID-19)

What is Coronavirus disease 2019?

Coronavirus disease 2019 (COVID-19) is a respiratory illness that can spread from person to person. The virus that causes COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China.

Can I get COVID-19?

Yes. COVID-19 is spreading from person to person in many parts of the world, including in the United States. Risk of infection from the virus that causes COVID-19 is higher for people who are close contacts of someone known to have COVID-19, for example, healthcare workers, or household members. Other people at higher risk for infection are those who live in or have recently been in an area with ongoing spread of COVID-19. The measures listed below are designed to prevent infection transmission, but also to reduce viral load if infected which can reduce severity of the disease.

How does COVID-19 spread?

The virus is thought to spread mainly between people who are in close contact with one another (within about 6 feet) through respiratory droplets and aerosols produced when an infected person coughs or sneezes, or when they speak or shout. Aerosol spread in a poorly ventilated indoor space may result in infections of people that are more than 6 feet apart. It also may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

What are the symptoms of COVID-19?

Patients with COVID-19 have had mild to severe respiratory illness with symptoms of:

- fever
- cough
- shortness of breath
- pneumonia in both lungs and other severe complications

Additional symptoms may include the following:

- Fatigue

- Muscle/body aches
- Headache
- New loss of taste/smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting

The listings above do not include all of the possible symptoms; for current information, please see <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>

People can help protect themselves from COVID-19 and other respiratory illnesses with everyday preventive actions.

- Avoid close contact with people who are sick.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Wash your hands often with soap and water for at least 20 seconds.
- Use an alcohol-based hand sanitizer that contains at least 60% ethyl alcohol or 70% isopropyl alcohol, if soap and water are not available.
- Practice social distancing – stay 6’ away from other people. Avoid handshakes and hugs.
- Imagine everyone around you smokes. Your goal is to avoid their smoke plume.
- All Parsons employees will check in daily, prior to start of work, on their ProtectWell app on their Parsons phone. It will also be required that all employees take their temperature with the handheld thermometers prior to the start of their workday.
- Employees that are working in an office or trailer or driving in a vehicle by themselves are not required to wear face coverings.
- If multiple employees are working in an office or trailer or driving in a vehicle, face coverings will be required along with social distancing.
- Where air purifiers or other ventilation devices are provided in trailers or offices, employees present should ensure that they are turned on and functioning when the space is occupied.
- Open windows to improve ventilation whenever feasible.
- Employees working out in the field are required to wear face coverings if social distancing is not possible. i.e. 6 feet or less.
- Asymptomatic carriers can spread the disease, so it is critical that people who feel fine still follow social distancing and masking protocols.

If you are sick, to keep from spreading COVID-19 and other respiratory illnesses to others, you should

- Stay home when you are sick.
 - Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
 - Clean and disinfect frequently touched objects and surfaces.
 - People are most infectious just before or just after showing symptoms, so it is critical to stay home at the first sign of sickness.
-

What workplace guidance is available to help protect employees and prevent the spread of COVID-19?

- Employees are asked to review Parsons' internal COVID-19 Crisis Response site and Company News Group updates for the latest directives on travel, working/returning to work and other relevant documents.
 - A COVID-19 Prevention Procedure has been developed to offer additional field guidance covering personal hygiene practices, cleaning/sanitation, training and other relevant information.
-

Are there additional resources to learn more about COVID-19?

- Centers for Disease Control - Interim Guidance for Businesses and Employers (<https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>).
 - For hygiene and hand washing best practices, Centers for Disease Control COVID—19 How to Protect Yourself. (<https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html>).
 - World Health Organization Hand Rubbing poster (https://www.who.int/gpsc/5may/How_To_HandRub_Poster.pdf)
 - EPA list of disinfectants (<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>)
-

Appendix 1-2 - Business Travel COVID-19 Pandemic

Parsons Corporate Response Management Team (CRMT) is actively monitoring the outbreak caused by COVID-19 (coronavirus). Updates are being announced in the [Company News Workplace group](#) regularly as conditions change. This Appendix is intended to provide managers with additional information to help manage the crisis during business travel activities.

TRAVEL

All employees are advised to postpone all non-essential business travel, domestic or international, until further notice. This includes non-essential attendance at meetings, conferences, and events.

Essential Travel is defined as:

- Travel to and from client meetings when it is not feasible to conduct the meeting virtually or postpone the meeting.
- Travel required to prevent immediate impacts to the health and safety of the employee and family.
- Travel, that if postponed or cancelled, would cause material impacts to the financial, operational, business development, safety, reputational, legal or compliance status of Parsons.
- When in doubt about what is essential, contact your leadership team.

In general, COVID-19 is believed to be most commonly transmitted via person-to-person contact. There's certainly the chance of contracting the virus through contact with contaminated surfaces, but [according to the CDC](#), this is "not thought to be the main way the virus spreads."

There are several great resources on the [CDC](#) and [WHO](#) websites about precautions we can take to stay healthy and limit exposure to COVID-19. Traveling employees are encouraged to take preventative actions to help stop the spread of germs:

- Wash hands frequently using soap and water.
- Use alcohol-based hand sanitizer frequently as recommended
- Avoid touching your eyes, nose, and mouth with an unwashed hand
- Wearing masks: Are you sick? If so, wearing a mask will protect others. If not, wearing a mask may or may not protect you. Masks are much more effective when placed on an infected person
- Practice social distancing when possible
- Avoid areas of known infection or interactions with known infected

Control Measures are provided in the table below to reduce the likelihood of infection during essential business travel.

Appendix 1-2 - Business Travel COVID-19 Pandemic

Table 1: Protection Against COVID-19 During Business Related Travel

ACTIVITY	HAZARD	CONTROL
Airline Travel	<p>Transmission Through Person to Person Contact</p> <ul style="list-style-type: none"> • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects 	<p>Airline travel is permitted if considered essential (see definition above)</p> <p>Employees are encouraged to wash their hands after passing through the security checkpoint and before eating or drinking</p> <p>Avoid touching your eyes, nose or mouth with unwashed hands</p> <p>Travel with disinfecting wipes if possible and clean frequently touched surfaces (tray table, armrest, and seatback display)</p> <p>If carrying hand sanitizer, apply before takeoff and after disinfecting surfaces</p> <p>Avoid aisle seats as you are exposed to more passengers during the flight.</p>
Staying in Hotels	<p>Transmission Through Person to Person Contact</p> <ul style="list-style-type: none"> • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects 	<p>Top tier and other hotel chains have established COVID-19 response plans for protecting guests. Employees should not stay in hotels or hotel chains in which a COVID-19 response plan has not been published</p> <p>Employees are encouraged to wash their hands immediately upon entering the room</p> <p>Travel with disinfecting wipes if possible and clean frequently touched surfaces in room (remote control, light switches, bedside lamp switches, the alarm clock, the phone, the bathroom sink)</p> <p>Remove the comforter to avoid potential contact with lingering bodily fluids that can harbor germs</p> <p>Employees are asked to practice social distancing when possible and should discuss accommodation options (e.g. kitchenette) with their manager prior to booking.</p>
Carpooling (Parsons Vehicles)	<p>Transmission Through Person to Person Contact</p> <ul style="list-style-type: none"> • Between people who are in close contact with one another (within about 6 feet). 	<p>Carpooling in Parsons vehicles is permitted if travel is considered essential (see definition above).</p> <p>Carpooling or ridesharing with strangers or non-essential passengers <i>in Parsons vehicles</i> is prohibited.</p> <p>Don't carpool if you or other passengers are symptomatic (fever, cough, or shortness of breath) or have been in close proximity to someone who has contracted the virus within the last 14 days.</p>

Appendix 1-2 - Business Travel COVID-19 Pandemic

ACTIVITY	HAZARD	CONTROL
<p>Carpooling (Parsons Vehicles)</p>	<ul style="list-style-type: none"> • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects 	<p><u>Regularly clean and disinfect your vehicle:</u></p> <ul style="list-style-type: none"> • The steering wheel is constantly touched. They should be wiped down with a disinfectant wipe or spray daily. • Don't forget the exterior and interior door handles, your gear shifter, the climate control buttons and radio knobs or buttons, the rearview mirror, and your center console including the cupholders. • Look for specific wipes available made for cleaning your car's leather. • Use microfiber cloths to wipe down touchscreens. <p><u>Things to keep in your vehicle:</u></p> <ul style="list-style-type: none"> • Box of tissues along with a small trash bag to gather the used tissues. Empty it daily. • Hand sanitizer: According to the Centers for Disease Control, use a hand sanitizer that contains at least 60% alcohol. • Sanitary wipes or spray
<p>Traveling to Remote Locations</p>	<p>Transmission Through Person to Person Contact</p> <ul style="list-style-type: none"> • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects 	<p>Work in remote locations is permitted if travel is considered essential (see definition above). Employees should never perform remote field activities alone</p> <p>Ensure reasonable quantities of food, water, medicines and essentials in the event of travel restrictions, quarantine or limited local supplies.</p> <p>For field work, pack adequate supplies of disinfectants, sanitizing products, trash bags, and nitrile gloves. Disinfect equipment and shared tools before and after use</p> <p>Identify nearest healthcare providers along route and at designation to assist with any medical needs or severe sickness prior to trip</p> <p>Ensure availability and/or ability to use communication devices. Contact Parsons Global Hotline: 1-667-225-6153 for business travel emergencies</p>

Attachment 1-3 – COVID-19 Self-Declaration Form

To prevent the spread of COVID-19 and reduce the potential risk of exposure to our employees and others, we are conducting a simple screening questionnaire. The questionnaire should be reviewed daily. Your participation is important to help us take precautionary measures to protect you and everyone at your project location. Thank you for your time.

Name:	Contact Number:
Company/Organization:	Parsons POC:
Project Name:	City/State:

Self-Declaration

1. Have you returned from any of the Level 3 countries listed on the CDC website <https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html> within the last 14 days, or are you traveling to Missouri from a state which is subject to a listed quarantine (as applicable)?

Yes

No

2. Have you had close contact with or cared for someone diagnosed with COVID-19 within the last 14 days?

Yes

No

3. Have you been in close contact with anyone who has traveled within the last 14 days to one of the Level 3 countries listed on <https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html> .

Yes

No

4. Have you experienced any cold or flu-like symptoms in the last 14 days (including fever, cough, sore throat, respiratory illness, difficulty breathing)?

Yes

No

If the answer is “yes” to any of the following questions, access to the field project location is not permitted.

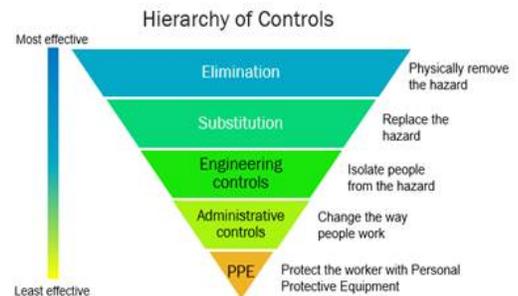
Signature (visitor): _____ Date: _____

1. Purpose

This document provides guidance to reduce the potential for contracting or spreading Coronavirus Disease 2019 (COVID-19).

2. Procedure

- 2.1. Parsons Corporate Response Management Team (CRMT) actively monitors the outbreak and impacts COVID-19 may have on our employees and customers.
- 2.2. Project Managers are asked to refer to Parsons internal COVID-19 Crisis Responses site and Company News Group updates for the latest directives on travel, working/returning to work and other relevant documents/resources. Project Managers shall modify this procedure as updates are made to internal guidance.
- 2.3. Project Managers are encouraged to collaborate with customers, subcontractors, and partners on crisis guidelines and contingency/preparedness plans. Our customers, subcontractors, and partners may provide different guidelines to their employees, ultimately impacting Parsons employees. In cases where local site guidelines are stricter, the strictest will apply.
- 2.4. The potential exposure to COVID-19 will be incorporated into each project's risk register, risk planning meetings and mitigation documents, as appropriate.
- 2.5. Exposure mitigations will be based on the hierarchy of controls, with PPE serving as the last line of protection.
 - 2.5.1. **Elimination:** We must eliminate all non-critical-path work/travel until further notice (i.e., work that may be conducted remotely must be).
 - 2.5.2. **Administrative Control:** We must ensure that our people are effectively isolated from COVID-19 exposure, utilizing social distancing and perimeter barricading, when possible. Symptomatic employees must not be allowed to enter the work zone – with no exceptions.
 - 2.5.3. **Administrative control:** All employees must be required to frequently wash and disinfect their hands per CDC guidelines. This will require dedicated staffing to reinforce this control among all work groups in all work zones.
 - 2.5.4. **Administrative control:** All common areas, breakrooms, restrooms, and working surfaces used by Parsons employees must be cleaned and disinfected per CDC guidelines. Each project should establish their own sanitation schedule based upon usage but no less than daily.
 - 2.5.5. **Administrative Control:** All onsite workers must complete COVID-19 awareness training before being allowed to work on site.
 - 2.5.6. **Administrative Control:** Breaks and lunches can be staggered in order to minimize employee contact and interaction. Site specific guidelines must implemented to ensure that guidelines related to social distancing, handwashing and sanitation are adhered to.



2.5.7. **PPE:** Where social distancing guidelines, general hygiene and surface sanitation practices cannot be adhered to, then appropriate respiratory protection must be provided and worn. Additionally, workers and worksite visitors must always wear medical grade gloves. All OSHA requirements related to the use of respiratory protection training (e.g., training, fit testing, medical screening, etc.) must be followed.

2.6. For additional information, please refer to the Centers for Disease Control - Interim Guidance for Businesses and Employers (<https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>).

3. Personal Hygiene

- 3.1. Frequently wash your hands with soap and water for at least 20 seconds and always before/after eating and arriving/departing the site.
- 3.2. If soap and running water are not available, use an alcohol-based hand rub that contains at least 60% ethyl alcohol or at least 70% isopropyl alcohol.
- 3.3. Avoid touching your eyes, nose, or mouth with unwashed hands.
- 3.4. Use respiratory etiquette, including covering coughs and sneezes. Wash hands or use hand sanitizer after each time you cough or sneeze.
- 3.5. Minimize contact among employees, contractors, and other stakeholders by replacing face-to-face meetings with virtual communications and implementing telework if feasible.
- 3.6. Utilize disinfectants from the EPA list (<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>) by wiping down surfaces you touch prior to starting work and routinely throughout the day, including shared vehicles as appropriate.
- 3.7. Clean and disinfect all supplies (pens, clipboards, etc.), tablets, cellphones, reusable equipment (meters, pumps, etc.), and non-disposable PPE (hardhats, safety glasses, earmuffs) at the end of each day. Avoid using other employee's phones and personal work items, when possible.
- 3.8. Practice social distancing – stay 6' away from other people. Avoid handshakes.
- 3.9. Do not come to work if you are sick or exhibiting any symptoms of COVID-19. Refer to internal COVID-19 site for additional guidance on returning to work.
- 3.10. If another person onsite comes into work or to the site sick, isolate them, and send them home, if Parsons is the controlling employer. If Parsons is not the controlling employer, isolate employees from the person, and inform the controlling employer accordingly.
- 3.11. For additional guidance on hygiene and hand washing best practices, please refer to the Centers for Disease Control COVID-19 How to Protect Yourself (<https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html>).

4. Field Trailer Cleaning/Sanitation

The following steps should be taken if site employees are utilizing common areas for meetings and breaks.

- 4.1. Each Parsons managed location must designate responsible person(s) for cleaning all common areas within a field trailer. This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.
- 4.2. If Parsons employees have work areas in a shared field trailer controlled by others, obtain information from controlling employer on sanitation practices.
- 4.3. To clean common areas, use disinfectants found on the EPA list.
- 4.4. Labels contain instructions for safe and effective use of the cleaning product, including manner of application, precautions to be taken when applying the product, such as wearing gloves (Personal Protective Equipment), and using good ventilation during use of the product. Gloves should be discarded after each cleaning and disinfection.
- 4.5. Provide disposable disinfecting wipes for staff to use on commonly used surfaces (for example, keyboards, desks, etc.) which can be wiped down by staff at their own workstations. Throw disinfecting wipes away after one use.
- 4.6. Have hand sanitizer available at common areas for employee use. Post the World Health Organization Hand Rubbing poster (https://www.who.int/gpsc/5may/How_To_HandRub_Poster.pdf) near shared sanitizers.

5. Screening Employees – Pandemic Conditions

Parsons may encounter Customer requests or higher risk field locations (e.g., craft projects, multi-employer) that require additional steps to support the separation of symptomatic employees from the healthy population. The objective is to reduce risk and potential COVID-19 exposures to those entering the facility and/or field location.

- 5.1. Self-declaration questionnaires (See Appendix 9.3) can be used as a means to pre-screen employees prior to accessing a locations point of entry. **Note:** Project Managers may need to update this questionnaire as local conditions and requirements change (e.g., updates to Customer quarantine requirements). Any changes to the self-declaration questionnaire must be cleared by Parsons Legal. Employees are encouraged to self-monitor their body temperature at home prior to completing the self-declaration questionnaire when feasible.
- 5.2. Onsite temperature screenings are permitted under the following conditions:
 - 5.2.1. The agent conducting the screening has a health service background with the requisite training, equipment, and knowledge necessary to effectively assess worker suitability to enter the work zone. For Parsons controlled sites, this will require contracting through a local health service provider.
 - 5.2.2. A visible barricade has been established around the perimeter of all Parsons work areas to ensure that no “non-cleared” personnel enter these work zones at any time. Cleared personnel are those who have been assessed as asymptomatic for COVID-19 infection by an agent who has been expressly trained to recognize and test persons for symptoms.

- 5.2.3. All workers must be assessed and cleared prior to entering these work zones.
- 5.2.4. Workers must line up a minimum of 6 ft. apart in advance of these work zones prior to being assessed.

6. Training

- 6.1. COVID-19 awareness training is included on the project training matrix. Subcontractors must train their own employees.
- 6.2. At a minimum, the following information and training is provided:
 - 6.2.1. Sources of exposure to the COVID-19
 - 6.2.2. The hazards associated with that exposure, and appropriate workplace protocols in place to prevent or reduce the likelihood of exposure
 - 6.2.3. Information regarding where employees can go to obtain more knowledgeProject Managers can utilize Appendix 9.1 COVID-19 Factsheet to assist with employee awareness training.
- 6.3. Supervisors must brief employees on any applicable updates to internal COVID-19 guidance during daily huddles/toolbox meetings before beginning work.
- 6.4. Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employees.

7. Responsibilities

- 7.1. **Corporate SH&E:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; support and guidance to help ensure the success of this procedure; and auditing its effectiveness.
- 7.2. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; implementing and enforcing this procedure, and designating a records custodian for the project.
- 7.3. **Records Custodian:** Responsible for documenting and maintaining employee training.
- 7.4. **Subcontractor:** Complies with all Parsons' requirements. Submit subcontractor COVID-19 preparedness documentation. Trains subcontractor employees.

8. Exceptions

- 8.1. The Project Manager may request or require a more stringent process if required by the contract or is beneficial to the project.

9. Attachments

- 9.1. COVID-19 Factsheet

- 9.2. Business Travel COVID-19 Pandemic
- 9.3. COVID 19 Self-declaration Form

Revision History

Revision	Changes	Approver	Approval Date
0	Original Issue	Barker, John	3/20/2020
1	Added Section 2.5 and Section 5. Added Appendix 9.2 and 9.3	Barker, John	3/31/2020

Attachment 2 - Worker's Compensation Information



- Parsons uses WorkCare as our Corporate Medical Director and Occupational Health Consultant. Parsons is committed to the health and well-being of its employees. Work Care’s role is to ensure that Parsons employees receive timely, appropriate, high-quality medical care and that necessary work restrictions are accommodated.
- WorkCare must be contacted when a Parsons employee comes to the clinic, prior to treatment in all non-emergency cases. WorkCare will make every effort to also call the clinic prior to the employee’s arrival. If you have not been contacted by WorkCare, please call 1-888-449-7787 and identify what clinic you are from, the nature of your concern, and ask to speak to a WorkCare clinician.
- Please note that Parsons expects WorkCare to assist in the process of developing a course of treatment.
- Please also note that you may receive calls from both Parsons and WorkCare.
- A “Work Status Report” form is attached so that you can make recommendations regarding the injured employee’s work capacity. The medical provider’s role is to identify any activity restrictions that will allow the injured body part to heal. These activity restrictions should be adhered to 24/7. Parsons responsibility is to determine what work can be done safely with these activity restrictions. Parsons is committed to providing temporary modified duty (transitional work) for those employees who are unable to return to work on full duty. **WorkCare requests that Parsons employees return-to-work unless their injury is so severe that they are confined to bed rest with no activity permitted.**
- Parsons is also committed to reducing OSHA recordable injuries. We request that you keep these OSHA recordability guidelines in mind when treating Parsons employees. We are not in any way encouraging under treatment of employees but at the same time, over treatment should be avoided. For example, use of steri-strips instead of sutures is preferred if such treatment is proper for a given laceration. Use of over-the-counter (OTC) medications at OTC dosages is also preferred if deemed adequate for treatment. Provide prescription level medication to employees if it is required for proper medical treatment
- IMMEDIATELY upon conclusion of EVERY medical evaluation (initial and all follow-up evaluations), place phone call and/or email and/or fax to Donna Miller to provide diagnosis and return-to-work restrictions, as long as jurisdiction requirements permit such. Also, provide copy to injured worker.
- WorkCare is available 24/7, 365 days a year at: 1-888-449-7787
- Parsons Workers’ Compensation Claims Manager
Donna P. Miller
Office Telephone No. and Cell No.: (661) 904-0978
Fax No.: (866) 293-0114
100 West Walnut Street
Pasadena, CA 91124
Email: donna.miller@parsons.com



Work Status Report Please Fax to Donna Miller (866) 293-0114 and Provide Copy to Employee

Employee Name:					Claim Number:																	
Diagnosis:					Date of Injury:		____/____/____ (mm / dd /yyyy)															
RETURN TO WORK STATUS																						
<input type="checkbox"/> May return to regular work (Date): / / <input type="checkbox"/> Released to full duty with intention given not to aggravate injury (Date): / / <input type="checkbox"/> May return to modified work (Date): / / <input type="checkbox"/> May not return to work until (Estimated Date): / / Estimated Duration of Modified Work:																						
PHYSICAL LIMITATIONS: I certify the employee can perform duties within the capabilities defined as follows:																						
<input type="checkbox"/> Without any restrictions.																						
OTE: In terms of an 8-hour workday, Occas. (Occasionally) equals 1-33%; Freq. (Frequently) equals 34-66%; Contin. (Continuously) equals 67-100%																						
Capabilities	Never	Occas.	Freq.	Contin.	Lifting\Carrying	Never	Occas.	Freq.	Contin.													
Bend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0-5 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Squat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6-10 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Crawl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11-20 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Reach above shoulders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21-25 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Kneel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26-50 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Stoop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	51-100 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Climb stairs, steps and step stools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Repeated push/pull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Climb ladders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Repeated simple grasp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Walk on uneven ground	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Repeated fine manipulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Other (Specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other (Specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
Restrictions of Activities			None	Mild	Moderate	Total	Comments															
Unprotected heights			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
Be around moving machinery			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
Exposure to changes in temperature and humidity			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
Driving automotive equipment			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
Exposure to dust, fumes, and gases			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
In an 8-hour workday, Worker can: (CHECK full capacity for each activity)																						
Total at One Time (Hours)					Total During Entire 8-Hour Day (Hours)																	
Hours	0	1/2	1	2	3	4	5	6	7	8	Hours	0	1/2	1	2	3	4	5	6	7	8	
Sit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sit	<input type="checkbox"/>														
Stand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stand	<input type="checkbox"/>														
Walk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Walk	<input type="checkbox"/>														
<input type="checkbox"/> Job duties were explained to me by (Name/Title):											On (Date):											
											/ /											
<input type="checkbox"/> I have received a written list of job tasks.																						
<input type="checkbox"/> I have NOT received a written list of job tasks, BUT I AGREE THAT DUTIES MAY BE ASSIGNED AND/OR CHANGED, SO LONG AS THEY MATCH THE LIMITS DEFINED BY ME ABOVE. <input type="checkbox"/> No <input type="checkbox"/> Yes																						
PROGNOSIS																						
Permanent Restrictions Likely? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown at this time																						
Medically Stationary? <input type="checkbox"/> No <input type="checkbox"/> Yes Date: / /																						
Physician Name (PRINT):						Telephone No.:																
Signature:						Date: / /																



The employee's Manager must complete an IndustrySafe incident report within (4) hours of his or her knowledge of the incident.

Promptly, i.e. the same day, notify your SH&E Director and Parsons' Workers' Compensation Claims Manager Donna Miller (donna.miller@parsons.com or 661 904 0978).

If the work-related incident is serious/life threatening or requires emergency response, first call 911 or local emergency medical services before contacting your SH&E Director, filing the IndustrySafe online incident report, or involving WorkCare.

For all other work-related injury(s) or illness(s), Parsons' employees shall promptly contact WorkCare, before seeking medical care, as this will provide the greatest opportunity for appropriate intervention.

*After consulting with WorkCare, if medical care is indicated or requested, Manager (preferred) or designated alternate shall accompany injured worker to the office/project's designated occupational medical clinic.

Workcare's Incident Intervention is available for all Parsons employees and agency employees - 24 hours per day, 7 days a week, and 365 days a year (24/7/365).

WorkCare: when dialing from North America: 888-449-7787

When dialing from outside of North America: 714.456.2104

Unless the injury or illness is life threatening, a medical emergency or after-hours at the occupational medical clinic, efforts should be made for the injured employee to be seen at the Occupational Medical Clinic listed above, and not at a hospital emergency room.

The procedures above are intended to enhance our incident reporting and investigation processes, assure quality care for injured employees, and ensure hazards are resolved to prevent recurrence.

*There may be an option for telemedicine virtual visit for some U.S. locations.

Refer to: Option of Telemedicine for Initial New Work-Related Matters U.S. only

The Process:

1. Employee is injured at work and reports injury to manager
2. Manager and employee call WorkCare, if manager and employee are unable to complete call to WorkCare together, manager directs the employee to call WorkCare – available 24/7 1.888.449.7787
3. Manager completes Industrysafe report
4. If WorkCare determines a clinic visit is appropriate and/or if employee requests a clinic visit, if employee does not wish to go to physical clinic location, telemedicine virtual clinic visit with Concentra is option in those states/jurisdictions that permit such*
5. WorkCare notifies Donna Miller/Candice Violante of request for telemedicine visit via WorkCare Incident Intervention email
6. Donna Miller/Candice Violante provides authorization to Concentra for Telemedicine visit (via Concentra portal)
7. For Telemedicine, employee must have:
 - Access to a quiet, private location. The employee will need this for privacy
 - A computer, smartphone, or mobile device with a with a webcam and microphone
 - Concentra Telemed requires video to work
 - An internet connection and active email address. If a Parsons email address is not available, then a personal email address may be used
 - They will need this to connect to their telemedicine visit
8. Employee registers for Concentra:
 - Connect to Concentra via Desktop/laptop
 - www.concentratelemed.com
 - Connect to Concentra via Tablet/smartphone
 - Go to Apple app store or Google Play app
 - Search for the Concentra Telemed app (free) and download the app
 - Open the app
 - Sign up or log in. You'll need to use your email address.

The Visit:

After the injured worker has signed into the system:

1. Select the option to start a visit with an available care coordinator. Depending on the availability, you may be added to a virtual “waiting room” while you wait for them to connect
2. The care coordinator will ask you some questions about your medical history and why you’re visiting.
3. You’ll be queued in a virtual waiting room to see a doctor. If you need to step away, remember to click the box that says TEXT ME so that you’ll be reminded when the clinician is ready.
4. Time for your appointment! Talk to the clinician as much as you need.
5. When you’re done, you’ll check out with your care coordinator. They’ll help you get scheduled for another visit if you need it.

Concentra Telemed uses advanced security software to protect your information and ensure your privacy, and your visit is not recorded.

Need help? Having technical issues? Call Concentra at 1.855.835.6337

*Serious injuries or injuries that need hands-on care, like stitches, will still need to be seen in-person by a clinician. Depending on the severity of an injury, the clinician may refer the employee for in-person medical care.

Concentra Telemedicine is available in: AK, AZ, CA, CO, CT, DE, FL, GA, HI, IL, IA, IN, KS, KY, LA, MA, ME, MD, MI, MN, MO, NE, NH, NJ, NM, NC, OH, OK, OR, PA, RI, SC, TN, TX, UT, VT, VA, WI

Attachment 3 - Respiratory Protection Plan

Name of the person's responsible for maintaining the program and communicating program requirements to employees:

- Ray DHollander – Project Manager
- Anne Burnham – Asst. Project Manager
- Darrell Pruitt – Program Safety Manager

Name(s) of the designated competent persons assigned responsibility for conducting activities within the program:

- Ray DHollander – Project Manager
- Anne Burnham – Asst. Project Manager
- Darrell Pruitt – Program Safety Manager

1.1 Respirator Selection

- 1.1.1 AHAs will identify respiratory hazards on the project. The project management team determines if an exposure assessment by an industrial hygienist is necessary to thoroughly assess the hazards and recommend controls and contacts the program safety manager for further guidance.
- 1.1.2 Engineering control is the most effective means of controlling atmospheric contaminants in the workplace. Agency regulations require the use of engineering control measures as much as is feasible to control atmospheric contaminants. When effective engineering controls are not feasible or while they are being implemented, appropriate respirators will be used.
- 1.1.3 Estimate the anticipated airborne concentrations from any previous monitoring or air sampling in accordance with the Air Monitoring Procedure.
- 1.1.4 The project management team selects the proper respirator according to the Respirator Selection Logic Procedure, Section III from the NIOSH/Centers for Disease Control (CDC) Respirator Selection Logic (NIOSH Publication No. 2005-100) online at www.cdc.gov/niosh/npptl/topics/respirators. Selection requires consideration of the following:
 - 1.1.4.1 Nature of the hazard (including physical properties, physiological effects, etc.)
 - 1.1.4.2 Extent of the hazard
 - 1.1.4.3 Contaminants present and concentrations (in relation to established exposure limit concentrations, and immediately dangerous to life or health (IDLH) concentrations
 - 1.1.4.4 Characteristics and limitations of specific respirators
 - 1.1.4.5 Expected activity of workers
- 1.1.5 Respirators, filters, cartridges, and components must be certified by NIOSH/MSHA.
- 1.1.6 Use respirators only for the purpose intended; do not modify them in any way. Canisters and cartridges are specifically selected for gases/vapors and concentrations that may be encountered.
- 1.1.7 The project management team also selects additional personal protection equipment

(PPE) to protect from dermal or eye hazards, in accordance with the Personal Protective Equipment Procedure.

1.1.7.1 Procedures for medical qualification, in accordance with the Medical Qualification and Surveillance Procedure

1.1.7.2 Contact lens policy, if required

1.2 Respirator Use

1.2.1 The project management team ensures that employees receive a medical evaluation in accordance with the Medical Qualification and Surveillance Procedure before fit testing and using a respirator. **Note: This will be completed through WorkCare and WorkCare Physicians.**

1.2.2 If the employee wears spectacles, goggles, face shield, or welding helmet it must not adversely affect the seal of the respirator facepiece.

1.2.3 Soft and gas permeable contact lenses can be worn with respiratory protection; however, OSHA does not allow non gas-permeable / hard contact lenses to be worn in conjunction with respiratory protection. The project management team must include a site contact lens policy in the project respiratory protection plan, if required by special operations at the project site.

1.2.4 Employees must always maintain an effective communication system while respirators are worn.

1.2.5 To prevent fogging, use antifog compounds in low-temperature or high-humidity climates to coat the inside of the facepiece.

1.2.6 Discard chemical cartridges and/or mechanical filters and replace them as required by end-of use indicators, i.e., at the point of odor detection, initiating effect, or expiration of use time. Discard high- efficiency particulate absorption (HEPA) filters when breathing becomes difficult or if the filters become wet or damaged.

1.2.7 Employees are informed of the cartridge changeout schedule in accordance with the manufacturer's recommendations.

1.3 Respirator Storage

1.3.1 Employees store respirators in a convenient, clean, and sanitary location. At a minimum, store respirators in a protective bag and protect them from the following conditions:

1.3.1.1 Deformation of the facepiece or exhalation valve

1.3.1.2 Sunlight or extreme temperatures or other conditions

1.3.1.3 Contamination such as dust or damaging chemicals

1.3.1.4 Excessive moisture

1.3.2 The designated competent person stores the emergency respirators to meet the following requirements:

1.3.2.1.1 Respirators must be:

- 1.3.2.1.2 Accessible to the work area
- 1.3.2.1.3 Stored in compartments or with covers clearly marked as containing emergency respirators
- 1.3.2.1.4 Stored in accordance with instructions from the respirator manufacturer
- 1.3.2.1.5 An adequate number of emergency respirators must be available in each area where they may be needed

1.4 Respirator Cleaning

1.4.1 The project management team ensures that respirators are kept clean, sanitary, and in good working order and (at no cost to the employee. The employee (or designee) must keep the respirator clean and disinfect it as often as specified below:

1.4.1.1 If the respirator is used exclusively by one employee, clean and disinfect the respirator as often as needed to:

1.4.1.1.1 Keep it clean and functional

1.4.1.1.2 Prevent health hazards such as skin irritation

1.4.1.2 If the respirator is shared for nonemergency use or is used for fit-testing or training, clean and disinfect the respirator before it is worn by another employee.

1.4.1.3 If the respirator is shared for emergency use, clean and disinfect the respirator after each use so the respirator is immediately ready for use at all times.

1.4.2 The project respiratory protection plan details the procedures for cleaning and disinfecting respirators, in accordance with manufacturer's recommendations. These procedures will result in a clean and sanitary respirator and will not damage the respirator or harm the user.

1.4.3 Automated cleaning and disinfecting are permitted. A central facility may clean and disinfect if the respirators provided the facility are clean, sanitary, and function properly. Respirators must be assembled properly after they are cleaned or disinfected.

1.4.4 The Respirator Cleaning Procedure provides a general guideline for cleaning if the respirator manufacturer does not furnish specific cleaning procedures.

- **Respiratory Cleaning Procedure**

- o The most current version of this standard is available for download and use on the Parsons Corporate Policy Center.
 1. Remove filters, cartridges, or canisters. Remove speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
 2. Wash components in warm (110°F maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the

removal of dirt.

3. Rinse components thoroughly in clean, warm (110°F maximum), preferably running water. Drain.
4. If the cleaner used does not contain a disinfecting agent, immerse the respirator components for 2 minutes in one of the following solutions:
 - a. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110°F; OR
 - b. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliter of tincture of iodine (6 to 8 grams ammonium and/or potassium iodide per 100 cc of 45% alcohol) to 1 liter of water at 110°F; OR
 - c. Other commercially available cleansers of equivalent disinfectant quality when used as directed if their use is recommended or approved by the respirator manufacturer.
5. Rinse components thoroughly in clean, warm (110°F maximum), preferably running water. Drain. *The importance of thorough rinsing cannot be overemphasized.* Detergents or disinfectants that dry on facepieces may result in dermatitis. Some disinfectants may also cause deterioration of rubber or corrosion of metal parts if not completely removed.
6. Hand-dry the components with a clean lint-free cloth or air-dry them.
7. Reassemble the facepiece and replace filters, cartridges, and canisters where necessary.
8. Test the respirator to ensure that all components work properly.

1.4.4.1 Methods to be used for fit testing

1.5 Fit Testing

- 1.5.1 The program safety manager will arrange a qualitative fit test for each respirator user before the initial use and annually for each specific (model, size) respirator worn, according to manufacturer's recommendations and the provisions of the project respiratory protection plan. Fit tests are performed and documented through WorkCare and WorkCare facilities. Facial hair cannot come between the sealing periphery of the facepiece and the face or interfere with valve function.
- 1.5.2 Quantitative fit testing, e.g., Porta-Count particle counter, may be required for work with some materials or at certain projects. WorkCare and their Physicians will complete this required fit testing at one of their authorized facilities.
- 1.5.3 The employee must perform a field fit check of respirator's seal each time he dons the

respirator and before he enters a hazardous atmosphere.

1.6 Training

1.6.1 Parsons trains employees in the proper use and care of respirators. The subcontractors must train their own employees.

1.6.2 The project management team arranges employee training at the time of initial assignment and when a new hazard is introduced to the jobsite. This training can be organized and presented to groups or on a work area by work area basis, depending on the operation.

1.6.3 Based on their duties, Parsons' employees will be trained if they:

1.6.3.1 Use respirators

1.6.3.2 Supervise respirator users

1.6.3.3 Issue, repair, or adjust respirators

1.6.3.4 Present effective training in a way that employees understand

1.6.4 Supervisors address and communicate appropriate worker respiratory protection at daily huddles before beginning work. Supervisors are responsible for identifying training needs during risk mitigation planning (2-week look ahead), in accordance with the *Parsons ESHARP Guidebook*, Volume 1, Section 12

1.6.4.1 At a minimum, the information and training includes the following topics:

- Details of the project respiratory protection plan.
- Who to contact for questions regarding chemicals?
- Why the respirator is necessary. For example, include information identifying respiratory hazards such as hazardous chemicals, the extent of the employee's exposure, and potential health effects and symptoms.
- The respirator's capabilities and limitations. For example, include how the respirator provides protection and why air-purifying respirators cannot be used in oxygen-deficient conditions.
- How improper fit, use, or maintenance can compromise the respirator's effectiveness and reliability.
- How to properly inspect, don, seal check, use, and remove the respirator.
- How to know when to change specific air-purifying respirator filters or cartridges.
- How to clean, disinfect, repair, and store the respirator, or how to have this done by someone else.
- How to use the respirator effectively in emergency situations, e.g., what to do when a respirator fails and where emergency respirators are stored.

- Medical signs and symptoms, e.g., shortness of breath or dizziness, which might limit or prevent the effective use of respirators.
- Medical surveillance and fit testing.

1.6.5 Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employee