**Penn Yan Former Manufactured Gas Plant Site**

**YATES COUNTY**

**PENN YAN, NEW YORK**

# SITE MANAGEMENT PLAN

**NYSDEC Site Number: 862009**

**Prepared for:**

New York State Electric and Gas Corp

18 Link Drive, PO Box 5224, Binghamton, NY 13902

**Prepared by:**

AECOM

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518-951-2200

**Revisions to Final Approved Site Management Plan:**

| Revision No. | Date Submitted | Summary of Revision | NYSDEC Approval Date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

**JANUARY 2023**

# CERTIFICATION STATEMENT

I certify that I am currently a NYS registered professional engineer as in defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Carsten H. Floess P.E.

1/13/2023 DATE

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## List of Acronyms

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|---|---|
| AA | Access Agreement |
| ACM | Asbestos Containing Material |
| AECOM | AECOM USA, Inc. |
| AS | Air Sparging |
| ASP | Analytical Services Protocol |
| BCA | Brownfield Cleanup Agreement |
| BCP | Brownfield Cleanup Program |
| bgs | Below Ground Surface |
| BMPs | Best Management Practices |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| CAMP | Community Air Monitoring Plan |
| C/D | Construction and Demolition |
| CFR | Code of Federal Regulation |
| CLP | Contract Laboratory Program |
| CLSM | Controlled Low Strength Material |
| COC | Certificate of Completion |
| CO2 | Carbon Dioxide |
| CP | Commissioner Policy |
| DER | Division of Environmental Remediation |
| DUSR | Data Usability Summary Report |
| EC | Engineering Control |
| ECL | Environmental Conservation Law |
| ELAP | Environmental Laboratory Approval Program |
| ERP | Environmental Restoration Program |
| EWP | Excavation Work Plan |
| GHG | Greenhouse Gas |
| GWE&T | Groundwater Extraction and Treatment |
| HASP | Health and Safety Plan |
| IC | Institutional Control |
| NAPL | Non-Aqueous Phase Liquid |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health |
| NYSEG | New York State Electric and Gas Corp |
| NYCRR | New York Codes, Rules and Regulations |
| O&M | Operation and Maintenance |
| OM&M | Operation, Maintenance and Monitoring |
| OSHA | Occupational Safety and Health Administration |
| OU | Operable Unit |
| tPAH | Total Polycyclic Aromatic Hydrocarbon |
| PDI | Pre-Design Investigation |
| PDIWP | Pre-Design Investigation Work Plan |
| P.E. or PE | Professional Engineer |
| PFAS | Per- and Polyfluoroalkyl Substances |

| | |
|---|---|
| PID | Photoionization Detector |
| PRP | Potentially Responsible Party |
| PRR | Periodic Review Report |
| QA/QC | Quality Assurance/Quality Control |
| QAPP | Quality Assurance Project Plan |
| QEP | Qualified Environmental Professional |
| RAO | Remedial Action Objective |
| RAWP | Remedial Action Work Plan |
| RDWP | Remedial Design Work Plan |
| RCRA | Resource Conservation and Recovery Act |
| RI/FS | Remedial Investigation/Feasibility Study |
| ROD | Record of Decision |
| RP | Remedial Party |
| RSO | Remedial System Optimization |
| SAC | State Assistance Contract |
| SCG | Standards, Criteria and Guidelines |
| SCO | Soil Cleanup Objective |
| SI | Supplemental Investigation |
| SMP | Site Management Plan |
| SOP | Standard Operating Procedures |
| SOW | Statement of Work |
| SPDES | State Pollutant Discharge Elimination System |
| SSD | Sub-slab Depressurization |
| SVE | Soil Vapor Extraction |
| SVI | Soil Vapor Intrusion |
| SVOC | Semi-Volatile Organic Compound |
| TAL | Target Analyte List |
| TCL | Target Compound List |
| TCLP | Toxicity Characteristic Leachate Procedure |
| USEPA | United States Environmental Protection Agency |
| UST | Underground Storage Tank |
| VCA | Voluntary Cleanup Agreement |
| VCP | Voluntary Cleanup Program |
| VOC | Volatile Organic Compound |

# ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification: NYSDEC Site #862009, Penn Yan Former MGP Site Penn Yan, New York

| | |
|---|---|
| Institutional Controls: | 1. The property may be used for restricted residential use; |
| | 2. Maintain ECs, restriction on use of groundwater, annual inspections, notification of ownership or usage change for the properties, implementation of SMP, environmental easement, and future intrusive activities to follow excavation work plan. |
| | 3. All ECs must be inspected at a frequency and in a manner defined in the SMP. |
| Engineering Controls: | 1. Soil and engineered cover system<br>2. Controlled Low Strength Material (CLSM) |

| Inspections: | Frequency |
|---|---|
| 1. Soil and engineered cover system inspection | Annually |
| 2. Periodic Review | Annually |
| Monitoring: | |
| 1. Groundwater Monitoring | Quarterly |
| 2. Soil Vapor Intrusion evaluations for New Buildings. | As needed |
| Maintenance: | |
| 1. Soil and engineered cover system maintenance | As needed |
| 2. Groundwater monitoring well maintenance | As needed |
| Reporting: | |
| 1. Groundwater Monitoring Report | Quarterly |

Site Identification: NYSDEC Site #862009, Penn Yan Former MGP Site Penn Yan, New York

| | |
|---|---|
| 2. Periodic Review Report | Annually for the first 5 years |

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

# 1.0 INTRODUCTION

## 1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Penn Yan Former Manufactured Gas Plant Site located in Village of Penn Yan, Town of Milo, New York (hereinafter referred to as the "Site"). See Figure 1. The Site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program Site No. 862009 which is administered by New York State Department of Environmental Conservation (NYSDEC or Department).

New York State Electric and Gas Corporation (NYSEG) entered into an Order on Consent on March 30,1994 with the NYSDEC to remediate the Site. Figures showing the site location and boundaries of this Site are provided in Figures 2A and 2B. The boundaries of the Site are more fully described in the metes and bounds Site description that is part of the Environmental Easement provided in Appendix A.

After completion of the remedial work, some contamination was left at this Site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement will be granted to the NYSDEC, and recorded with the Yates County Clerk, requires compliance with this SMP and all ECs and ICs placed on the Site.

This SMP was prepared to manage remaining contamination at the Site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6 NYCRR Part 375 and the Order on Consent (Index # DO-0002-9309; Site #862009) for the Site, and thereby subject to applicable penalties.

All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the Site is provided in Appendix B of this SMP.

This SMP was prepared by AECOM USA, Inc. (AECOM), on behalf of NYSEG, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and ECs that are required by the Environmental Easement for the Site.

## 1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. The NYSDEC can also make changes to the SMP or request revisions from the remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the Site, the NYSDEC project manager will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

## 1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC and NYSEG, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

1. 60-day advance notice of any proposed changes in Site use that are required under the terms of the Order on Consent, 6 NYCRR Part 375 and/or Environmental Conservation Law.

2. 7-day advance notice of any field activity associated with the remedial program.

3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan. If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.

4. Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.

5. Notice within 48 hours of any non-routine maintenance activities.

6. Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

7. Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

8. At least 60 days prior to the change, the NYSDEC and NYSEG will be notified in writing by the property owner of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Order on Consent, and all approved work plans and reports, including this SMP.

9. Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 includes contact information for the above notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

# 2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

## 2.1 Site Location and Description

The Site is located in the Village of Penn Yan, Town of Milo, Yates County, New York and is composed of two contiguous parcels of land (see Figure 2A). The larger parcel is identified as Section/Block/Lot #049.75-1-55 and the smaller parcel is identified as Section/Block/Lot #049.75-1-56 on the Yates County Tax Map. The Site is an approximately 0.815-acre area. The larger parcel is approximately 0.805 acres and the smaller parcel is approximately 0.01 acres. The Site is bounded to the north by Water Street, the Keuka Lake Outlet, a Class C waterway, to the south, a commercial property located at 128 Liberty Street to the west, and a mixed commercial/residential property consisting of a three-story commercial building occupied by a wine store and a private residence to the east (see Figure 2A – Site Layout Map) . Further to the east is the mixed commercial/residential Birkett Landing development adjacent to the outlet. The boundaries of the Site are more fully described in Appendix A – Environmental Easement. The owner of the Site parcel at the time of issuance of this SMP is/are:

New York State Electric and Gas (NYSEG)

The off-site Area consists of an approximate 1.7-acre portion of the Keuka Lake Outlet, a Class C waterway. The off-site Area consists of submerged sediments beneath the Keuka Lake Outlet claimed by the State of New York.

## 2.2 Physical Setting

### 2.2.1 Land Use

The Site consists of the following: a currently vacant masonry “gas house” building which was formerly used for gas manufacturing operations. This building is located within

the historic district of the Village of Penn Yan as defined by the New York State Department of Parks and Recreation. The remaining areas of the parcel consist of a mowed, grass-covered area, driveways and parking area, and a grass/brush covered riparian strip of land along Keuka Lake outlet. The smaller parcel is located adjacent to Water Street, to the northeast of the former MGP process area. A small building is currently present on the parcel, housing the natural gas regulator servicing the Village of Penn Yan. The Site is zoned Waterfront Development and Conservation (WDC) District, which permits commercial and residential uses. The properties adjoining the Site, and in the neighborhood surrounding the Site, primarily include commercial and residential properties. The Keuka Lake Outlet is south of the Site; immediately north of the Site is Water Street; immediately West of the Site is a commercial property at 128 Liberty Street. One building is present at this property which is currently being renovated for commercial use. The properties immediately east of the Site include commercial and residential properties. Immediately east of the Site is a three-story mixed commercial/residential building occupied by a wine store and a private residence. Further to the east is the mixed commercial/residential Birkett Landing development adjacent to the Outlet.

### 2.2.2 Geology

Three soil units have been identified in the subsurface beneath the Site. From the ground surface downward, these are a manmade fill unit, a silt and clay unit, and a sand unit. The fill unit is found across the Site and generally ranges from 4 feet thick (around the MGP building) to 13 feet thick (adjacent to Water St). The thickness of the fill unit adjacent to the Keuka Lake Outlet is approximately 8 feet.

Beneath the fill is a silt and clay unit that ranges in thickness between 10 and 20 feet. This silt unit appears to act as a potential aquitard beneath the Site, limiting movement of groundwater and contaminants from the Site. A sand unit of unknown thickness is present below the silt. The depth to bedrock is unknown; however, it is likely greater than 300 feet bgs in the area of the Site (NYSDEC, 2012).

The Keuka Lake Outlet has an organic silt sediment unit approximately 4 feet thick. Beneath the silt is a clay unit of unknown thickness.

Geologic cross sections are shown in Figures 3A and 3B. Site specific boring logs associated with the monitoring wells are provided in Appendix C.

### 2.2.3 Hydrogeology

The groundwater table has historically been present between 3 and 15 feet below ground surface (bgs) at the Site. Groundwater flows from the northwest to the southeast across the Site towards the Keuka Lake Outlet. Horizontal hydraulic conductivity testing was performed for six wells in 1990 by TRC Companies, Inc. (TRC). The hydraulic conductivity measurements ranged from $1 \times 10^{-3}$ cm/sec to $7 \times 10^{-5}$ cm/sec.

Groundwater contour maps are shown in Figures 4A and 4B. Quarterly groundwater elevation data from first quarter 2021 through third quarter 2022 is provided in Table 2. Groundwater monitoring well construction logs are provided in Appendix C.

## 2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

The Site was initially developed as a malt house and wood storage facility, operating from the 1840's to the late 1890's. The MGP was constructed in 1899 and operated until 1931. During this period gas was manufactured using a coal gasification process using coal, coke, and water. The operating companies included the Penn Yan Gas Light Company (1889–1926) and the New York State Central Electric Corporation (1927–1931). Gas was distributed to consumers through buried mains and used primarily for illumination. Several byproducts from the MGP process including coal tar, ash, and purifier waste were stored on-Site and either sold or disposed off-Site.

The previous remedial activities at the Site are listed below:

- Between 1986 and 1990, TRC performed fieldwork at the Site that included the excavation of test pits; the completion of soil borings; the installation of monitoring wells; and the analyses of soil, surface water, groundwater, and sediment samples (TRC, 1986, 1990a).
- Between September 1991 and May 1992, SLC Consultants/Constructors, Inc. (SLC) performed remedial work at the Site (SLC, 1991 and 1992). Subsurface Tar Tank A was uncovered and cleaned out. The 3,000-gallon underground storage tank (UST) located between the warehouse/garage building and the Outlet (Tar Tank B) was also decommissioned, cleaned-out and removed. Tar-impacted soil was excavated from the tank pit area.
- A Supplemental Investigation (SI) was performed by Geraghty and Miller, Inc. in June 1994 (Geraghty and Miller, 1994b). The SI included the completion of three soil borings and the collection of additional sediment samples. Following the SI, eight rounds of groundwater sampling were performed including sampling in November 1991, November 1992, November 1993, July 1994, April 1995, April 1996, April 1997, and April 1998.
- AECOM conducted a remedial investigation (RI) and submitted a RI report to NYSDEC in November of 2008 (AECOM, 2008). The scope of the RI included subsurface utility clearing, surface and subsurface soil sampling, test pit excavation, soil boring installation, monitoring well installation and development, groundwater sampling, sediment probing and sampling, bathymetric surveys and site surveys.
- In November 2012, AECOM submitted a Feasibility Study (FS) Report assessing remedial alternatives for the Site (AECOM, 2012). The recommended alternative included excavation and dredging of contaminated materials on-site and in the Outlet.
- In December 2012, NYSDEC issued a Record of Decision (ROD) for the Site, which established a remedial action for the on-site and off-site impacted materials (NYSDEC, 2012). The selected remedial action includes excavation of on-site soils and sediments in the Outlet. The remedial action objectives (RAOs) established by the ROD are summarized in Section 2.3.
- The Remedial Design Work Plan (RDWP) was submitted on March 13, 2013 and approved by the NYSDEC on May 28, 2013.
- The Pre-Design Investigation Work Plan (PDIWP) was submitted on March 13, 2013 and approved by the NYSDEC on May 28, 2013. Addendum No. 1 of the PDIWP was submitted on October 7, 2013, to change the location of two geotechnical borings, and approved by the NYSDEC on October 7, 2013. Addendum No. 2 of the PDIWP was submitted on January 23, 2014, to excavate test pits and expose the building foundation and perform a hazardous building materials survey and approved by the NYSDEC on January 24, 2014.
- AECOM conducted the pre-design investigation (PDI) during two mobilizations to the Site. The initial mobilization occurred from July 9, 2013 to July 18, 2013. The second mobilization to the Site occurred from February 3, 2014 to February 7, 2014.

- AECOM submitted the Remedial Design Report in June 2014. The remedial activities, executed from July 2015-November 2019, included the following:
    - Asbestos containing material (ACM) and hazardous materials abatement of the Former MGP Building.
    - Structural repairs and reinforcement of the Former MGP Building.
    - Removal of sediment in the Keuka Lake Outlet which contains visible non-aqueous phase liquid (NAPL), sheen, or which produce a visible sheen when agitated.
    - Removal of sediment in the Keuka Lake Outlet adjacent to the Site and downstream of the Site to the downstream control structure with concentrations of total polycyclic aromatic hydrocarbon (tPAH) compounds at levels above the Site-specific background concentration of 43 milligrams per kilogram (mg/kg) tPAH17 (NYSDEC, 2012) to a depth no greater than two feet.
    - Backfill areas where sediment was removed to re-establish bottom elevations and provide habitat for aquatic organisms.
    - Excavation of sub-surface soil with concentrations of total semi-volatile organic compounds (SVOCs) greater than 500 mg/kg, concentrations of volatile organic compounds (VOCs) greater than 10 mg/kg, or soils which are visually impacted with NAPL and/or NAPL sheens.
    - Removal of former MGP structures, debris, piping, and major obstructions which remain in the subsurface to the extent practicable.
    - Excavation of surface soil exceeding restricted-residential soil cleanup objectives (SCOs).
    - Backfilling excavations to re-establish original Site grades.
    - Placement of Site cover consisting of pavement, sidewalks, buildings, or two feet of clean soil.
    - Transportation of excavated soil and sediment to the temporary fabric structure (TFS) for amendment and dewatering. Restore Restoration of the Site with topsoil and gravel; re-building the bank adjacent to the Site with riprap, topsoil and plantings, planting grass in Upland areas, and planting subaquatic vegetation in selected Outlet areas.
    - Off-Site transportation and disposal or treatment of soil and sediment removed from the Site at a permitted waste management facility.

## 2.4 Remedial Action Objectives

The RAOs for the Site as listed in the Record of Decision dated December 2012 are as follows:

### Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

### Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

### Sediment

RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments.

RAOs for Environmental Protection

- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain.
- Restore sediments to pre-release/background conditions to the extent feasible.

**Soil Vapor**

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

## 2.5 Remaining Contamination

This section presents a summary of impacts remaining at the Site and off-Site areas following remediation.

### 2.5.1 Soil

In areas of the building where the building's foundation was shallower than anticipated, MGP impacts (soils and coal tar) remain on or below the original foundation between the newly installed grade beams. Due to building stability issues and the impracticality of removing these materials, it became necessary to remove impacted materials from under the wall/grade beams and backfill with Controlled Low Strength Material (CLSM). The material was removed until visually clean at which point confirmation bottom samples were collected and the area was backfilled with CLSM with NYSDEC approval. In conjunction with the newly installed grade beams the CLSM encased any remaining impacted material within cementous material (grade beams and CLSM). In-place containment of impacted materials in these areas was approved by NYSDEC.

Table 3 and Figure 5 summarize the results of all soil samples collected that exceed the Unrestricted Use SCOs and the restricted residential Use SCOs at the Site after completion of remedial action.

### 2.5.2 Sediment

In accordance with the ROD, the remediation goal for sediment was tPAH17 of 43 mg/kg. This goal was exceeded at 4 sample locations in the Keuka Lake Outlet. A minimum of two feet of clean habitat fill was installed above these locations. All visual contamination was removed per the NYSDEC-approved visual screening process.

Table 4 and Figures 6A and 6B summarize the results of all sediment samples collected that exceed the Site Criteria Guidances (SCGs) after completion of the remedial action.

# 3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

## 3.1 General

Since remaining contamination exists at the Site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs both on and off-Site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC project manager.

This plan provides:

- A description of all on-Site and off-Site IC/ECs;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix D) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site and in the off-Site areas; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the Site remedy, as determined by the NYSDEC project manager.

## 3.2 Institutional Controls

A series of ICs is required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the Site to restricted residential uses only. Adherence to these ICs on the Site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figures 8A and 8B. These ICs are:

- The property may be used for: restricted residential use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Yates Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;
- Groundwater monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any physical component of the remedy shall be performed as defined in this SMP;
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;

- The potential for vapor intrusion must be evaluated for the building redeveloped in the area within the IC boundaries noted on Figure 7, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the Site are prohibited and
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

For the off-Site areas the Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- Groundwater and soil vapor monitoring must be performed as defined, and applicable, in this SMP;
- Data and information pertinent to site management must be reported to the NYSDEC at the frequency and manner defined in this SMP;
- ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for its intended use, as determine and pre-approved by the NYSDEC, New York State Department of Health (NYSDOH), and Yates County Department of Health;
- The potential for vapor intrusion must be evaluated for any buildings developed on the property, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited;
- Require the remedial party or Site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3); and
- Allow the use and development of the controlled property for restricted residential uses, though land use is subject to local zoning laws.

## 3.3 Engineering Controls

### 3.3.1 Soil Engineered Cover System

Exposure to remaining contamination at the Site is prevented by a soil and engineered cover system placed over the Site. On the Water Street side of the Site, this soil and engineered cover system is comprised of a minimum of 24 inches of clean soil. On the Outlet Bank side of the building, this system is comprised of a six-inch thick geoweb infilled with a one-inch layer of AquaGate overlain by a five-inch layer of AquaBlok, all overlain by a geotextile demarcation layer and a minimum of 12 inches of clean soil off-Site.

Figures 9A and 9B present the location of the two cover systems and applicable demarcation layers. The off-Site cover system comprised of the AquaGate and AquaBlok is located along the bank between the former gas house and the Keuka Lake Outlet.

The Excavation Work Plan (EWP) provided in Appendix D outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the Site and provided in Appendix E. Any disturbance of the Site's cover system must be overseen by a qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

### 3.3.2 Controlled Low Strength Material

Controlled Low Strength Material (CLSM) is present in the area of the building foundation as described in Section 2.5. The CLSM shall not be removed without prior approval from NYSDEC. The EWP provided in Appendix D outlines the procedures required to be implemented in the event the EC is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a HASP and associated CAMP prepared for the Site and provided in Appendix E.

### 3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. Unless waived by the NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the Site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

As discussed below, the NYSDEC may approve termination of a groundwater monitoring program. When a remedial party receives this approval, the remedial party will decommission all site-related monitoring, injection and recovery wells as per the NYSDEC CP-43 policy.

The remedial party will also conduct any needed site restoration activities, such as asphalt patching and decommissioning treatment system equipment. In addition, the remedial party will conduct any necessary restoration of vegetation coverage, trees and wetlands, and will comply with NYSDEC and United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the Site.

#### 3.3.3.1 – Soil and Engineered Cover System

The cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

#### 3.3.3.2 – Controlled Low Strength Material

The CLSM is a permanent control and the integrity of system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

# 4.0 MONITORING AND SAMPLING PLAN

## 4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC project manager. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the Site are included in the Quality Assurance Project Plan provided in Appendix F.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

## 4.2 Site – wide Inspection

Site-wide inspections of the on-Site and off-Site areas will be performed at a minimum of once per year. These periodic inspections must be conducted when the ground surface is visible (i.e. no snow cover). Site-wide inspections will be performed by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State. Modification to the frequency or duration of the inspections will require approval from the NYSDEC project manager. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix G – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage of on-Site and off-Site areas;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions of on-Site and off-Site areas at the time of the inspection;
- Whether stormwater management systems, such as basins and outfalls, are working as designed;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that Site records are up to date.

Inspections of all remedial components installed at the Site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the

SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC project manager must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the Site by a qualified environmental professional, as defined in 6 NYCRR Part 375. Written confirmation must be provided to the NYSDEC project manager within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

### 4.3 Treatment System Monitoring and Sampling

Samples shall be collected from the monitoring wells on a routine basis. Sampling locations, required analytical parameters and schedule are provided in Table 5. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The remedial party will properly dispose of all wastes generated during sampling the groundwater monitoring well network, at off-site disposal facilities, according to local,

state, and federal laws and regulations. Wastes will be tested before disposal to comply with the permit conditions of the disposal facility. Wastes generated at this Site include: groundwater.

Detailed sample collection and analytical procedures and protocols are provided in Appendix H– Field Sampling Plan and Appendix F – Quality Assurance Project Plan.

### 4.3.1 Groundwater Sampling

Groundwater monitoring will be performed quarterly to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The network of monitoring wells has been installed to monitor upgradient, on-site and downgradient groundwater conditions at the Site. Table 6 summarizes the wells identification number, as well as the purpose, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, 12 wells (six deep and six shallow) are sampled to evaluate the effectiveness of the remedial system. Eleven wells are located on-site and one well is located off-site, as shown in Figure 10. The remedial party will measure depth to the water table for each monitoring well in the network before sampling.

Monitoring well construction logs are included in Appendix C of this document.

If biofouling or silt accumulation occurs in the on-Site and/or off-Site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC project manager will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC project manager. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC project manager.

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

#### 4.3.2 Sediment Sampling (Keuka Lake Outlet Visual Monitoring)

Annual inspection will include visually monitoring for the presence of sheen and/or coal tar NAPL on the surface of the Keuka Lake Outlet near the Outlet Control Structure (flood control gates) at the Main Street bridge. Historically sheen and/or NAPL was only visible on the water surface during the warmest months of the year (i.e. June through August) so this visual monitoring will take place during summer months only.

A one-time post-remediation inspection for assessment of the reestablishment of the biotic community within the remediated portion of the Keuka Lake Outlet will be performed for inclusion in the first PRR.

### 4.3.3 Soil Vapor Intrusion Sampling

Prior to the construction of any enclosed structures located over areas that contain remaining contamination (Figure 8A and Figure 8B), a soil vapor intrusion (SVI) evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first investigating. This mitigation system may include a vapor barrier and/or passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH project managers for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York" (NYSDOH, 2006). Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH project managers for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation.

If conducted, SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report. The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the soil vapor intrusion sampling program are specified in Section 7.0 – Reporting Requirements.

#### 4.3.4 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix G - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Sampling Plan provided as Appendix H of this document.

## 4.4 Soil and Engineered Cover System Monitoring

Exposure of the residual contamination to people has been eliminated by the engineered controls implemented in areas where contamination may remain. The soil and engineered cover area should be observed during the annual Site inspection. The IC/EC certification in the PRR should include language regarding the status and condition of the engineered cover system consisting of pavement and/or soil cover and confirm that no excavation has been performed in the area without prior approval by the NYSDEC.

# 5.0 OPERATION AND MAINTENANCE PLAN

## 5.1 General

The Site remedy, also including the remedy for the adjacent off-Site area and the remediated portion of the Keuka Lake Outlet, does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

# 6.0 PERIODIC ASSESSMENTS/EVALUATIONS

## 6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the Site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or engineering controls to severe storms/weather events and associated flooding.

A narrow portion of the bank is in the FEMA 100-year flood plain as depicted on Figures 2A and 2B. However, the Site does not have any active remediation systems that would be susceptible to potential vulnerabilities due to power outage or flooding. Stormwater management is provided by the Village of Penn Yan stormwater management system. At this time there are not any Site components that would be susceptible to damage from high winds or erosion. Since this is not an active site, there are no remedial systems or site elements that could contribute to spill/release of contaminants. Since no potential vulnerabilities have been identified at the Site a vulnerability assessment is not needed for this SMP. In the future, if Site conditions change, the potential vulnerabilities will be reassessed and the SMP will be updated accordingly.

## 6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the Site during site management, and as reported in the Periodic Review Report (PRR).

Since the Site is in the post remedial phase, and there are no active remediation systems operating at the Site, the green remediation evaluation is limited to items relating to the monitoring and sampling activities at the Site. During the sampling and maintenance activities green remediation best management practices (BMPs) will be implemented at the Site. GSRx, a green and sustainable remediation tool developed by AECOM includes the following list of BMPs related to monitoring and sampling that will be considered:

- Consider the long-term effects of monitoring versus the short-term effects of source removal.
- Perform non-intrusive surveys to determine delineation boundaries (e.g. geophysical survey of USTs).
- Consider the use of direct sensing technologies to obtain geological, geotechnical, and hydrogeological information.
- Use long-term monitoring optimization approaches to eliminate redundant or otherwise unnecessary sampling.
- Consider the use of direct push technologies versus rotary technologies.
- Consider the use of data loggers to monitor groundwater levels.
- Consider the use of dedicated sampling equipment.
- Conduct investigation work with the use of real-time monitoring/sampling equipment to encourage in-field decisions for further investigation requirements.
- Specify laboratory analytical methods generating less waste and solvents, for solids and fluids, if comparable accuracies can be achieved.

- Consider the use of field testing and field screening methods.
- Use certified mobile laboratories to analyze collected samples.
- Consider the distance of the laboratory from the Site when evaluating qualified laboratories for testing that cannot be completed on-Site.
- Limit the number and size of shipments to off-Site laboratories.
- Encourage electronic deliverables from laboratories; discourage hard copy deliverables.

In addition, the following green and sustainable remediation BMPs will also be considered throughout the monitoring and sampling program implementation:

- Site visits will be coordinated such that multiple activities (e.g. groundwater sampling and Site inspections) will be conducted during the same visit in order to minimize travel.
- Rechargeable batteries will be used for field instruments versus disposable batteries.
- Field work will be conducted such that waste materials will be minimized.
- Noise impacts to off-site receptors will be minimized.
- Work and traffic patterns will be sequenced to minimize local traffic congestion.
- An idle reduction plan will be implemented for all on-site vehicles and machinery.
- Efficient traffic patterns will be established on-site to minimize local disturbance and noise.
- Equipment will be suitably sized to perform the work.
- Routine and on-time maintenance to equipment will be performed to improve fuel efficiency (i.e., oil changes).
- All vehicles and equipment that consume diesel fuel will use Low Sulfur Diesel Fuel.

### 6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the NYSDEC project manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

### 6.2.2 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site, use of consumables in relation to visiting the Site in order to conduct system checks and/or collect samples, and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

### 6.2.3 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix G – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits. A set of metrics has been developed.

## 6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC project manager or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the Site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focus on overall Site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to Site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

# 7.0. REPORTING REQUIREMENTS

## 7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix G. These forms are subject to NYSDEC revision. All site management inspection, maintenance, and monitoring events will be conducted by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 8 and summarized in the Periodic Review Report.

All monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;

- Copies of all laboratory data sheets, and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

## 7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the NYSDEC project manager beginning sixteen (16) months after the approval of this SMP is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually for five years to the NYSDEC project manager or at another frequency as may be required by the NYSDEC project manager. In the event that the Site and adjacent off-site area is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the Site described in Appendix A -Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site and off-site area.
- Results of the required annual Site and off-site area inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the Site and off-site area during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- Identification of any wastes generated during the reporting period, along with waste characterization data, manifests, and disposal documentation.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.

- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These tables and figures will include a presentation of past data as part of an evaluation of contaminant concentration trends, including but not limited to:
  - Trend monitoring graphs that present groundwater contaminant levels from before the start of the remedy implementation to the most current sampling data;

  - Trend monitoring graphs depicting system influent analytical data on a per event and cumulative basis;
  - O&M data summary tables;
  - A current plume map for sites with remaining groundwater contamination; and
  - A groundwater elevation contour map for each gauging event.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

- A Site and off-site area evaluation, which includes the following:

  - The compliance of the remedy with the requirements of the site-specific Remedial Action Work Plan (RAWP), ROD or Decision Document;
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
  - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan;
  - An evaluation of trends in contaminant levels in the affected media to determine if the remedy continues to be effective in achieving remedial goals as specified by the RAWP, ROD or Decision Document; and
  - The overall performance and effectiveness of the remedy.

#### 7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

*"For each institutional or engineering control identified for the Site and off-site area, I certify that all of the following statements are true:*

- *The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The inspection of the adjacent off-site area to confirm the effectiveness of the engineered cover system required by the remedial program was performed under my direction;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program.*
- *The ICs/ECs employed at this Site and adjacent off-site area are unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the Site and adjacent off-site area will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the Site and adjacent off-site area is compliant with the environmental easement ;*
- *The information presented in this report is accurate and complete.*

*I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] for the Site."*

*"I certify that the New York State Education Department has granted a Certificate of Authorization to provide Professional Engineering services to the firm that prepared this Periodic Review Report."*

The signed certification will be included in the Periodic Review Report.

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager. The Periodic Review Report may also need to be submitted in hard-copy format, if requested by the NYSDEC project manager.

## 7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control or failure to conduct site management activities, a Corrective Measures Work Plan will be submitted to the NYSDEC project manager for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC project manager.

## 7.4 Remedial Site Optimization Report

If an RSO is to be performed (see Section 6.3), upon completion of an RSO, an RSO report must be submitted to the NYSDEC project manager for approval. A general outline for the RSO report is provided in Appendix I. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the

recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager.

## 8.0 REFERENCES

6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

AECOM, 2008. Remedial Investigation Report, Penn Yan Water Street MGP Site, Penn Yan, New York, NYSDEC Site No., 8-62-009, Index # D0-000-9309. November 20, 2008.

AECOM, 2014. Remedial Design Report, Penn Yan Water Street MGP Site, Penn Yan, New York, NYSDEC Site No., 8-62-009, Index # D0-000-9309. August 2014.

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

NYSDEC, 2012. Record of Decision, NYSEG, Penn Yan Water Street MGP, Penn Yan, Yates County, New York, Site No. 8-62-009. December 2012.

Table 1: Notifications

| Name | Contact Information | Required Notification** |
|---|---|---|
| Gerald Pratt<br>NYSDEC Project Manager<br>Division of Environmental Remediation<br>Section C Bureau C Geologist | 518-402-9667<br>gerald.pratt@dec.ny.gov | All Notifications |
| Kiera Thompson<br>NYSDEC GW | 518-402-9663<br>kiera.thompson@dec.ny.gov | All Notifications |
| John Ruspantini<br>NYSEG Project Manager | 607-725-3801<br>jjruspantini@nyseg.com | Notifications 1 and 8 |
| Steve Mullin<br>NYSEG Manager<br>Environmental Remediation Program | 585-771-4556<br>steve_mullin@rge.com | Notifications 4, 6, and 7 |

**Notes:**

Notifications are subject to change and will be updated as necessary.

**Numbers in this column refernce the numbered bullets in the notificaiton list in this section 1.3.

Table 2: Groundwater Elevation Measurements

| Well ID | Measuring Point Elevation | Actual Depth to Bottom | Screen Interval | Date | Depth to Water (feet TOC) | Groundwater Elevation |
|---|---|---|---|---|---|---|
| PRMW-1S | 731.11 | 29.90 | 20 - 30 | February 22, 2021 | 15.40 | 715.71 |
| | | | | May 24, 2021 | 11.23 | 719.88 |
| | | | | August 23, 2021 | 6.52 | 724.59 |
| | | | | November 29, 2021 | 10.10 | 721.01 |
| | | | | February 24, 2022 | 10.20 | 720.91 |
| | | | | May 31, 2022 | 10.86 | 720.25 |
| | | | | August 3, 2022 | 10.84 | 720.27 |
| PRMW-2S | 734.55 | 23.09 | 10 - 20 | February 22, 2021 | 16.10 | 718.45 |
| | | | | May 24, 2021 | 15.63 | 718.92 |
| | | | | August 23, 2021 | 14.19 | 720.36 |
| | | | | November 29, 2021 | 12.13 | 722.42 |
| | | | | February 24, 2022 | 14.87 | 719.68 |
| | | | | May 31, 2022 | 15.71 | 718.84 |
| | | | | August 3, 2022 | 16.26 | 718.29 |
| PRMW-2D | 734.64 | 38.55 | 25 - 35 | February 22, 2021 | 16.47 | 718.17 |
| | | | | May 24, 2021 | 15.84 | 718.80 |
| | | | | August 23, 2021 | 14.59 | 720.05 |
| | | | | November 29, 2021 | 15.14 | 719.50 |
| | | | | February 24, 2022 | 15.08 | 719.56 |
| | | | | May 31, 2022 | 15.68 | 718.96 |
| | | | | August 3, 2022 | 15.89 | 718.75 |
| PRMW-3S | 723.73 | 22.90 | 10 - 20 | February 22, 2021 | 7.72 | 716.01 |
| | | | | May 24, 2021 | 7.42 | 716.31 |
| | | | | August 23, 2021 | 6.31 | 717.42 |
| | | | | November 29, 2021 | 6.90 | 716.83 |
| | | | | February 24, 2022 | 6.88 | 716.85 |
| | | | | May 31, 2022 | 7.18 | 716.55 |
| | | | | August 3, 2022 | 7.25 | 716.48 |
| PRMW-3D | 723.81 | 36.25 | 25 - 35 | February 22, 2021 | 6.80 | 717.01 |
| | | | | May 24, 2021 | 5.64 | 718.17 |
| | | | | August 23, 2021 | 4.89 | 718.92 |
| | | | | November 29, 2021 | 4.94 | 718.87 |
| | | | | February 24, 2022 | 4.93 | 718.88 |
| | | | | May 31, 2022 | 5.04 | 718.77 |
| | | | | August 3, 2022 | 5.85 | 717.96 |
| PRMW-4S | 721.92 | 27.30 | 14 - 24 | February 22, 2021 | 7.52 | 714.40 |
| | | | | May 24, 2021 | 7.26 | 714.66 |
| | | | | August 23, 2021 | 6.00 | 715.92 |
| | | | | November 29, 2021 | 6.89 | 715.03 |
| | | | | February 24, 2022 | 6.26 | 715.66 |
| | | | | May 31, 2022 | 7.16 | 714.76 |
| | | | | August 3, 2022 | 7.20 | 714.72 |
| PRMW-5S | 720.72 | 22.70 | 10 - 20 | February 22, 2021 | 7.10 | 713.62 |
| | | | | May 24, 2021 | 6.66 | 714.06 |
| | | | | August 23, 2021 | 6.17 | 714.55 |
| | | | | November 29, 2021 | 6.88 | 713.84 |
| | | | | February 24, 2022 | 6.48 | 714.24 |
| | | | | May 31, 2022 | 6.45 | 714.27 |
| | | | | August 3, 2022 | 6.84 | 713.88 |
| PRMW-5D | 720.74 | 33.27 | 20 - 30 | February 22, 2021 | 4.32 | 716.42 |
| | | | | May 24, 2021 | 3.24 | 717.50 |
| | | | | August 23, 2021 | 2.62 | 718.12 |
| | | | | November 29, 2021 | 2.63 | 718.11 |
| | | | | February 24, 2022 | 3.30 | 717.44 |
| | | | | May 31, 2022 | 2.80 | 717.94 |
| | | | | August 3, 2022 | 3.58 | 717.16 |

See Notes on Page 2.

Table 2: Groundwater Elevation Measurements

| Well ID | Measuring Point Elevation | Actual Depth to Bottom | Screen Interval | Date | Depth to Water (feet TOC) | Groundwater Elevation |
|---|---|---|---|---|---|---|
| PRMW-6S | 721.10 | 23.20 | 10 - 20 | February 22, 2021 | 6.52 | 714.58 |
| | | | | May 24, 2021 | 6.28 | 714.82 |
| | | | | August 23, 2021 | 6.05 | 715.05 |
| | | | | November 29, 2021 | 6.04 | 715.06 |
| | | | | February 24, 2022 | 6.13 | 714.97 |
| | | | | May 31, 2022 | 6.09 | 715.01 |
| | | | | August 3, 2022 | 6.08 | 715.02 |
| PRMW-6D | 721.22 | 37.05 | 24 - 34 | February 22, 2021 | 4.85 | 716.37 |
| | | | | May 24, 2021 | 3.75 | 717.47 |
| | | | | August 23, 2021 | 2.99 | 718.23 |
| | | | | November 29, 2021 | 3.06 | 718.16 |
| | | | | February 24, 2022 | 3.97 | 717.25 |
| | | | | May 31, 2022 | 3.17 | 718.05 |
| | | | | August 3, 2022 | 3.82 | 717.40 |
| TMW-1D | 723.45 | - | 54 - 64 | May 24, 2021 | 5.17 | 718.28 |
| | | | | August 23, 2021 | 3.07 | 720.38 |
| | | | | November 29, 2021 | 4.40 | 719.05 |
| | | | | February 24, 2022 | 4.43 | 719.02 |
| | | | | May 31, 2022 | 4.76 | 718.69 |
| | | | | August 3, 2022 | 5.45 | 718.00 |
| TMW-2D | 719.24 | - | 50 - 60 | February 22, 2021 | 2.03 | 717.21 |
| | | | | May 24, 2021 | 0.79 | 718.45 |
| | | | | August 23, 2021 | 0.40 | 718.84 |
| | | | | November 29, 2021 | 0.09 | 719.15 |
| | | | | February 24, 2022 | 0.15 | 719.09 |
| | | | | May 31, 2022 | 0.15 | 719.09 |
| | | | | August 3, 2022 | 1.07 | 718.17 |
| TMW-2DR | 719.23 | - | 50 - 60 | August 3, 2022 | 1.17 | 718.06 |

**Notes:**
1. All measurements from Top of Casing (TOC).
2. "-" Indicates measurement not taken or not available.
3. Elevations in feet above mean sea level, 1929 National Geodetic Vertical Datum.
4. Depth calculated based on survey and well installation information provided by AECOM.

Table 3: Remaining Soil Contamination

| Location ID<br>Sample Date<br>Sample ID | NYSDEC Part 375-6 Restricted-Residential | *SOUTHEAST ROOM* | | | | |
|---|---|---|---|---|---|---|
| | | PWEXSWNA076<br>4/3/2019<br>480-151412-1 | PWEXSWNA080<br>4/4/2019<br>480-151412-5 | PWEXSWNA081<br>4/4/2019<br>480-151412-6 | PWEXSWNA082<br>4/4/2019<br>480-151412-7 | PWEXSWNA127<br>4/4/2019<br>480-151436-3 |
| **Semivolatile Organic Compounds (ppm)** | | | | | | |
| 2,4,5-Trichlorophenol | | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | | ND | ND | ND | ND | ND |
| 2,4-Dichlorophenol | | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | | ND | ND | ND | ND | ND |
| 2,4-Dinitrotoluene | | ND | ND | ND | ND | ND |
| 2,6-Dinitrotoluene | | ND | ND | ND | ND | ND |
| 2-Chloronaphthalene | | ND | ND | ND | ND | ND |
| 2-Chlorophenol | | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | | ND | **0.48** | ND | **0.11** | **0.073** |
| 2-Methylphenol | | ND | ND | ND | ND | ND |
| 2-Nitroaniline | | ND | ND | ND | ND | ND |
| 2-Nitrophenol | | ND | ND | ND | ND | ND |
| 3,3'-Dichlorobenzidine | | ND | ND | ND | ND | ND |
| 3-Nitroaniline | | ND | ND | ND | ND | ND |
| 4,6-Dinitro-2-methylphenol | | ND | ND | ND | ND | ND |
| 4-Bromophenyl phenyl ether | | ND | ND | ND | ND | ND |
| 4-Chloro-3-methylphenol | | ND | ND | ND | ND | ND |
| 4-Chloroaniline | | ND | ND | ND | ND | ND |
| 4-Chlorophenyl phenyl ether | | ND | ND | ND | ND | ND |
| 4-Methylphenol | | ND | ND | ND | ND | ND |
| 4-Nitroaniline | | ND | ND | ND | ND | ND |
| 4-Nitrophenol | | ND | ND | ND | ND | ND |
| Acenaphthylene | 100 | **0.76** | **4.9** | **0.15** | **0.49** | **0.12** |
| Acetophenone | | ND | ND | ND | ND | ND |
| Anthracene | 100 | **2.6** | **19** | **1.4** | **1.6** | **0.17** |
| Atrazine | | ND | ND | ND | ND | ND |
| Benzaldehyde | | ND | ND | ND | ND | ND |
| Benzo[a]anthracene | 1 | **1.7** | **22** | **2.7** | **1.3** | **0.86** |
| Benzo[a]pyrene | 1 | **1.7** | **15** | **2** | **1** | **0.73** |
| Benzo[b]fluoranthene | 1 | **1.7** | **17** | **2.1** | **1.1** | **0.68** |
| Benzo[g,h,i]perylene | 100 | **1.2** | **8.1** | **1.1** | **0.56** | **0.66** |
| Benzo[k]fluoranthene | 3.9 | **0.88** | **8.7** | **1.1** | **0.53** | **0.4** |
| bis (2-chloroisopropyl) ether | | ND | ND | ND | ND | ND |
| Bis(2-chloroethoxy)methane | | ND | ND | ND | ND | ND |
| Bis(2-chloroethyl)ether | | ND | ND | ND | ND | ND |
| Bis(2-ethylhexyl) phthalate | | ND | ND | ND | ND | ND |
| Butyl benzyl phthalate | | ND | ND | ND | ND | ND |
| Acenaphthene | 100 | **4.6** | **3.2** | **0.034** | **0.42** | ND |
| Biphenyl | | **1.1** | **0.66** | **0.21** | **0.31** | **0.057** |
| Caprolactam | | ND | ND | ND | ND | ND |
| Carbazole | | **5** | **4** | **0.27** | **0.5** | **0.074** |
| Chrysene | 3.9 | **1.6** | **18** | **2.1** | **1** | **0.92** |
| Dibenz(a,h)anthracene | 0.33 | ND | **2.6** | ND | **0.17** | ND |
| Dibenzofuran | 59 | **5** | **12** | **1.1** | **1.2** | **0.12** |
| Diethyl phthalate | | ND | ND | ND | ND | ND |
| Dimethyl phthalate | | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | | ND | ND | ND | ND | ND |
| Fluoranthene | 100 | **5.9** | **53** | **5.2** | **2.6** | **0.9** |
| Fluorene | 100 | **4.4** | **19** | **0.62** | **1.3** | **0.055** |
| Hexachlorobenzene | | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | | ND | ND | ND | ND | ND |
| Hexachlorocyclopentadiene | | ND | ND | ND | ND | ND |
| Hexachloroethane | | ND | ND | ND | ND | ND |
| Indeno[1,2,3-cd]pyrene | 0.5 | **0.96** | **8.2** | **1.1** | **0.54** | **0.55** |
| Isophorone | | ND | ND | ND | ND | ND |
| Naphthalene | 100 | **0.47** | **5.3** | **0.1** | **1.9** | **0.42** |
| Nitrobenzene | | ND | ND | ND | ND | ND |
| N-Nitrosodi-n-propylamine | | ND | ND | ND | ND | ND |
| N-Nitrosodiphenylamine | | ND | ND | ND | ND | ND |
| Pentachlorophenol | 6.7 | ND | ND | ND | ND | ND |
| Phenanthrene | 100 | **13** | **75 D** | **3.2** | **5** | **0.47** |
| Phenol | 100 | ND | ND | ND | ND | ND |
| Pyrene | 100 | **4.9** | **43** | **5.2** | **2.1** | **1.5** |
| Total Conc | | **57.47** | **339.14** | **29.684** | **23.73** | **8.759** |
| Total Estimated Conc. (TICs) | | **16.6** | **242.6** | **16.18** | **17.86** | **4.81** |

**Notes:**

Results are pending data validation and DUSR preparation.

Results do not include laboratory data qualifier codes.

ND = Not detected above given laboratory reporting limit.

NR = Not reported

ppm = Parts per million

**Bold = Detected above reporting limit.**

Grey highlighted cells exceed the NYSDEC Part 375-6 Restricted Residential Use Level

Table 3: Remaining Soil Contamination

| Location ID<br>Sample Date<br>Sample ID | NYSDEC Part 375-6 Restricted-Residential | *SOUTHWEST ROOM* | | *SMALL NE ROOM* | *LARGE NORTHEAST ROOM* | |
|---|---|---|---|---|---|---|
| | | **PWEXSWNA120<br>4/8/2019<br>480-151556-6** | **PWEXSWNA121<br>4/9/2019<br>480-151605-4** | **PWEXSWNA088<br>4/9/2019<br>480-151605-16** | **PWEXSWNA152<br>4/9/2019<br>480-151605-13** | **PWEXSWNA093<br>4/9/2019<br>480-151605-9** |
| **Semivolatile Organic Compounds (ppm)** | | | | | | |
| 2,4,5-Trichlorophenol | | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | | ND | ND | ND | ND | ND |
| 2,4-Dichlorophenol | | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | | ND | ND | ND | ND | ND |
| 2,4-Dinitrotoluene | | ND | ND | ND | ND | ND |
| 2,6-Dinitrotoluene | | ND | ND | ND | ND | ND |
| 2-Chloronaphthalene | | ND | ND | ND | ND | ND |
| 2-Chlorophenol | | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | | ND | ND | **0.2** | ND | ND |
| 2-Methylphenol | | ND | ND | ND | ND | ND |
| 2-Nitroaniline | | ND | ND | ND | ND | ND |
| 2-Nitrophenol | | ND | ND | ND | ND | ND |
| 3,3'-Dichlorobenzidine | | ND | ND | ND | ND | ND |
| 3-Nitroaniline | | ND | ND | ND | ND | ND |
| 4,6-Dinitro-2-methylphenol | | ND | ND | ND | ND | ND |
| 4-Bromophenyl phenyl ether | | ND | ND | ND | ND | ND |
| 4-Chloro-3-methylphenol | | ND | ND | ND | ND | ND |
| 4-Chloroaniline | | ND | ND | ND | ND | ND |
| 4-Chlorophenyl phenyl ether | | ND | ND | ND | ND | ND |
| 4-Methylphenol | | ND | ND | ND | ND | ND |
| 4-Nitroaniline | | ND | ND | ND | ND | ND |
| 4-Nitrophenol | | ND | ND | ND | ND | ND |
| Acenaphthylene | 100 | **11** | **1.1** | **0.31** | **0.11** | **0.73** |
| Acetophenone | | ND | ND | ND | ND | ND |
| Anthracene | 100 | **49** | **9.7** | **2.6** | **0.71** | **2.3** |
| Atrazine | | ND | ND | ND | ND | ND |
| Benzaldehyde | | ND | ND | ND | ND | ND |
| Benzo[a]anthracene | 1 | **46** | **13** | **2.1** | **1** | **2.2** |
| Benzo[a]pyrene | 1 | **31** | **9.6** | **1.3** | **0.79** | **1.7** |
| Benzo[b]fluoranthene | 1 | **32** | **11** | **1.8** | **0.9** | **2.2** |
| Benzo[g,h,i]perylene | 100 | **15** | **5.7** | **0.66** | **0.41** | **1.1** |
| Benzo[k]fluoranthene | 3.9 | **15** | **5.7** | **0.73** | **0.51** | **0.86** |
| bis (2-chloroisopropyl) ether | | ND | ND | ND | ND | ND |
| Bis(2-chloroethoxy)methane | | ND | ND | ND | ND | ND |
| Bis(2-chloroethyl)ether | | ND | ND | ND | ND | ND |
| Bis(2-ethylhexyl) phthalate | | ND | ND | ND | ND | ND |
| Butyl benzyl phthalate | | ND | ND | ND | ND | ND |
| Acenaphthene | 100 | **4.1** | **0.33** | **1.4** | **0.082** | **0.4** |
| Biphenyl | | **3.5** | ND | **0.71** | **0.24** | **0.54** |
| Caprolactam | | ND | ND | ND | ND | ND |
| Carbazole | | **4.8** | **0.8** | **0.48** | **0.29** | **0.64** |
| Chrysene | 3.9 | **37** | **9.5** | **1.5** | **0.74** | **1.8** |
| Dibenz(a,h)anthracene | 0.33 | ND | ND | ND | ND | **0.32** |
| Dibenzofuran | 59 | **24** | **2.1** | **2.7** | **0.84** | **2.1** |
| Diethyl phthalate | | ND | ND | ND | ND | ND |
| Dimethyl phthalate | | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | | ND | ND | ND | ND | ND |
| Fluoranthene | 100 | **120 D** | **28** | **5.1** | **1.5** | **5.4** |
| Fluorene | 100 | **30** | **2.1** | **3.1** | **0.67** | **2** |
| Hexachlorobenzene | | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | | ND | ND | ND | ND | ND |
| Hexachlorocyclopentadiene | | ND | ND | ND | ND | ND |
| Hexachloroethane | | ND | ND | ND | ND | ND |
| Indeno[1,2,3-cd]pyrene | 0.5 | **15** | **5.5** | **0.68** | **0.41** | **1** |
| Isophorone | | ND | ND | ND | ND | ND |
| Naphthalene | 100 | **1.5** | **0.33** | **10D** | **0.16** | **0.46** |
| Nitrobenzene | | ND | ND | ND | ND | ND |
| N-Nitrosodi-n-propylamine | | ND | ND | ND | ND | ND |
| N-Nitrosodiphenylamine | | ND | ND | ND | ND | ND |
| Pentachlorophenol | 6.7 | ND | ND | ND | ND | ND |
| Phenanthrene | 100 | **160 D** | **20** | **10D** | **2.9** | **9.7D** |
| Phenol | 100 | ND | ND | ND | ND | ND |
| Pyrene | 100 | **77 D** | **25** | **4** | **1.4** | **4.4** |
| Total Conc | | **675.9** | **149.46** | **51.17** | **13.662** | **40** |
| Total Estimated Conc. (TICs) | | **2644.7** | **46** | **44.75** | **15.61** | **31.14** |

**Notes:**

Results are pending data validation and DUSR preparation.

Results do not include laboratory data qualifier codes.

ND = Not detected above given laboratory reporting limit.

NR = Not reported

ppm = Parts per million

**Bold = Detected above reporting limit.**

Grey highlighted cells exceed the NYSDEC Part 375-6 Restricted F

Table 3: Remaining Soil Contamination

| Location ID<br>Sample Date<br>Sample ID | NYSDEC Part 375-6 Restricted-Residential | *NW ROOM*<br>PWEXSWNA101*<br>4/10/2019<br>480-151836-7 | *OUTSIDE E WALL OF NE/SE ROOMS*<br>PWEXSWNA150<br>4/10/2019<br>480-151836-6 | *WEST CORRIDOR*<br>PWEXSWNA109<br>4/11/2019<br>480-151821-2 | *WEST CORRIDOR*<br>PWEXSWNA114<br>4/11/2019<br>480-151821-5 | *Upland/TFS*<br>PWEXBM07174<br>9/11/2019<br>460-191058-1 |
|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds (ppm)** | | | | | | |
| 2,4,5-Trichlorophenol | | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | | ND | ND | ND | ND | ND |
| 2,4-Dichlorophenol | | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | | ND | ND | ND | ND | ND |
| 2,4-Dinitrotoluene | | ND | ND | ND | ND | ND |
| 2,6-Dinitrotoluene | | ND | ND | ND | ND | ND |
| 2-Chloronaphthalene | | ND | ND | ND | ND | ND |
| 2-Chlorophenol | | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | | **14** | ND | ND | **2.4** | **10** |
| 2-Methylphenol | | ND | ND | ND | ND | ND |
| 2-Nitroaniline | | ND | ND | ND | ND | ND |
| 2-Nitrophenol | | ND | ND | ND | ND | ND |
| 3,3'-Dichlorobenzidine | | ND | ND | ND | ND | ND |
| 3-Nitroaniline | | ND | ND | ND | ND | ND |
| 4,6-Dinitro-2-methylphenol | | ND | ND | ND | ND | ND |
| 4-Bromophenyl phenyl ether | | ND | ND | ND | ND | ND |
| 4-Chloro-3-methylphenol | | ND | ND | ND | ND | ND |
| 4-Chloroaniline | | ND | ND | ND | ND | ND |
| 4-Chlorophenyl phenyl ether | | ND | ND | ND | ND | ND |
| 4-Methylphenol | | ND | ND | ND | ND | **0.067** |
| 4-Nitroaniline | | ND | ND | ND | ND | ND |
| 4-Nitrophenol | | ND | ND | ND | ND | ND |
| Acenaphthylene | 100 | **14** | **0.13** | **0.57** | **1.1** | **7.9** |
| Acetophenone | | ND | ND | ND | ND | **0.92** |
| Anthracene | 100 | **35** | **0.24** | **1.6** | **1.6** | ND |
| Atrazine | | ND | ND | ND | ND | **6.4** |
| Benzaldehyde | | ND | ND | ND | ND | ND |
| Benzo[a]anthracene | 1 | **25** | **0.89** | **2.3** | **1.8** | ND |
| Benzo[a]pyrene | 1 | **17** | **0.75** | **1.9** | **1.1** | **5.5** |
| Benzo[b]fluoranthene | 1 | **20** | **1.1** | **2.1** | **1.4** | **3.6** |
| Benzo[g,h,i]perylene | 100 | **8.1** | **0.63** | **1.5** | **0.6** | **4.2** |
| Benzo[k]fluoranthene | 3.9 | **6.9** | **0.38** | **1.2** | **0.68** | **1.8** |
| bis (2-chloroisopropyl) ether | | ND | ND | ND | ND | **2.4** |
| Bis(2-chloroethoxy)methane | | ND | ND | ND | ND | **1.7** |
| Bis(2-chloroethyl)ether | | ND | ND | ND | ND | ND |
| Bis(2-ethylhexyl) phthalate | | ND | ND | ND | ND | ND |
| Butyl benzyl phthalate | | ND | ND | ND | ND | ND |
| Acenaphthene | 100 | **13** | ND | **0.26** | **0.37** | ND |
| Biphenyl | | **9.2** | ND | 100 | **0.45** | ND |
| Caprolactam | | ND | ND | ND | ND | ND |
| Carbazole | | **12** | ND | **0.14** | **0.62** | **2.2** |
| Chrysene | 3.9 | **23** | **0.85** | **1.8** | **1.2** | **4.6** |
| Dibenz(a,h)anthracene | 0.33 | ND | ND | **0.3** | ND | **0.67** |
| Dibenzofuran | 59 | **32** | **0.065** | **1.1** | **1.7** | **6.4** |
| Diethyl phthalate | | ND | ND | ND | ND | ND |
| Dimethyl phthalate | | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | | ND | ND | ND | ND | ND |
| Fluoranthene | 100 | **58** | **1.6** | **5.6D** | **3.5** | **12** |
| Fluorene | 100 | **32** | **0.081** | **0.81** | **2** | **7.4** |
| Hexachlorobenzene | | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | | ND | ND | ND | ND | ND |
| Hexachlorocyclopentadiene | | ND | ND | ND | ND | ND |
| Hexachloroethane | | ND | ND | ND | ND | ND |
| Indeno[1,2,3-cd]pyrene | 0.5 | **8** | **0.49** | **1.3** | **0.62** | **2.2** |
| Isophorone | | ND | ND | ND | ND | ND |
| Naphthalene | 100 | **180 D** | **0.074** | **0.043** | **5.5D** | **27** |
| Nitrobenzene | | ND | ND | ND | ND | ND |
| N-Nitrosodi-n-propylamine | | ND | ND | ND | ND | ND |
| N-Nitrosodiphenylamine | | ND | ND | ND | ND | ND |
| Pentachlorophenol | 6.7 | ND | ND | ND | ND | ND |
| Phenanthrene | 100 | **99** | **1** | **6D** | **5.3D** | **19** |
| Phenol | 100 | ND | ND | ND | ND | ND |
| Pyrene | 100 | **46** | **1.5** | **5.4** | **2.8** | **10** |
| Total Conc | | **652.2** | **9.78** | **34.023** | **34.74** | **135.957** |
| Total Estimated Conc. (TICs) | | **336.8** | **7.71** | **53.39** | **60.05** | **23.1** |

**Notes:**

Results are pending data validation and DUSR preparation.

Results do not include laboratory data qualifier codes.

ND = Not detected above given laboratory reporting limit.

NR = Not reported

ppm = Parts per million

**Bold = Detected above reporting limit.**

Grey highlighted cells exceed the NYSDEC Part 375-6 Restricted F

Table 3: Remaining Soil Contamination

| Location ID<br>Sample Date<br>Sample ID | NYSDEC Part 375-6 Restricted-Residential | *Undermining* | | |
|---|---|---|---|---|
| | | PWEXBM04101<br>5/21/2019<br>460-182570-2 | PWEXSWNA096<br>5/21/2019<br>460-182570-3 | PWEXBM04075<br>5/31/2019<br>460-183257-1 |
| **Semivolatile Organic Compounds (ppm)** | | | | |
| 2,4,5-Trichlorophenol | | ND | ND | ND |
| 2,4,6-Trichlorophenol | | ND | ND | ND |
| 2,4-Dichlorophenol | | ND | ND | ND |
| 2,4-Dimethylphenol | | **0.34** | ND | **0.055** |
| 2,4-Dinitrophenol | | ND | ND | ND |
| 2,4-Dinitrotoluene | | ND | ND | ND |
| 2,6-Dinitrotoluene | | ND | ND | ND |
| 2-Chloronaphthalene | | ND | ND | ND |
| 2-Chlorophenol | | ND | ND | ND |
| 2-Methylnaphthalene | | **1** | **2.3** | **0.024** |
| 2-Methylphenol | | ND | ND | ND |
| 2-Nitroaniline | | ND | ND | ND |
| 2-Nitrophenol | | ND | ND | ND |
| 3,3'-Dichlorobenzidine | | ND | ND | ND |
| 3-Nitroaniline | | ND | ND | ND |
| 4,6-Dinitro-2-methylphenol | | ND | ND | ND |
| 4-Bromophenyl phenyl ether | | ND | ND | ND |
| 4-Chloro-3-methylphenol | | ND | ND | ND |
| 4-Chloroaniline | | ND | ND | ND |
| 4-Chlorophenyl phenyl ether | | ND | ND | ND |
| 4-Methylphenol | | **0.12** | ND | **0.014** |
| 4-Nitroaniline | | ND | ND | ND |
| 4-Nitrophenol | | ND | ND | ND |
| Acenaphthylene | 100 | **1.9** | **0.51** | **0.38** |
| Acetophenone | | **3.8** | **0.92** | **0.18** |
| Anthracene | 100 | ND | ND | ND |
| Atrazine | | **12** | **2.9** | **0.67** |
| Benzaldehyde | | ND | ND | ND |
| Benzo[a]anthracene | 1 | ND | ND | ND |
| Benzo[a]pyrene | 1 | **6.1** | **2.7** | **0.48** |
| Benzo[b]fluoranthene | 1 | **4.8** | **2.1** | **0.28** |
| Benzo[g,h,i]perylene | 100 | **5.8** | **2.6** | **0.35** |
| Benzo[k]fluoranthene | 3.9 | **2.3** | **0.97** | **0.11** |
| bis (2-chloroisopropyl) ether | | **2** | **0.9** | **0.17** |
| Bis(2-chloroethoxy)methane | | **2.3** | **0.97** | ND |
| Bis(2-chloroethyl)ether | | ND | ND | ND |
| Bis(2-ethylhexyl) phthalate | | ND | ND | ND |
| Butyl benzyl phthalate | | ND | ND | ND |
| Acenaphthene | 100 | ND | ND | ND |
| Biphenyl | | ND | ND | ND |
| Caprolactam | | ND | ND | **0.23** |
| Carbazole | | **4.7** | **1.6** | **0.4** |
| Chrysene | 3.9 | **5.9** | **2** | **0.031** |
| Dibenz(a,h)anthracene | 0.33 | **0.49** | **0.22** | **0.6** |
| Dibenzofuran | 59 | **8.7** | **3.6** | ND |
| Diethyl phthalate | | ND | ND | ND |
| Dimethyl phthalate | | ND | ND | ND |
| Di-n-butyl phthalate | | ND | ND | **0.13** |
| Di-n-octyl phthalate | | ND | ND | ND |
| Fluoranthene | 100 | **17** | **7.6** | **1.1** |
| Fluorene | 100 | **8** | **2.8** | **0.67** |
| Hexachlorobenzene | | ND | ND | ND |
| Hexachlorobutadiene | | ND | ND | ND |
| Hexachlorocyclopentadiene | | ND | ND | ND |
| Hexachloroethane | | ND | ND | ND |
| Indeno[1,2,3-cd]pyrene | 0.5 | **2.9** | **1.3** | **0.16** |
| Isophorone | | ND | ND | ND |
| Naphthalene | 100 | **48** | **17** | **0.27** |
| Nitrobenzene | | ND | ND | ND |
| N-Nitrosodi-n-propylamine | | ND | ND | ND |
| N-Nitrosodiphenylamine | | ND | ND | ND |
| Pentachlorophenol | 6.7 | ND | ND | ND |
| Phenanthrene | 100 | **29** | **12** | **2** |
| Phenol | 100 | ND | ND | ND |
| Pyrene | 100 | **13** | **5.6** | **0.81** |
| Total Conc | | **180.15** | **70.59** | **9.114** |
| Total Estimated Conc. (TICs) | | **59** | **8.4** | **1.07** |

**Notes:**

Results are pending data validation and DUSR preparation.

Results do not include laboratory data qualifier codes.

ND = Not detected above given laboratory reporting limit.

NR = Not reported

ppm = Parts per million

**Bold = Detected above reporting limit.**

Grey highlighted cells exceed the NYSDEC Part 375-6 Restricted F

Table 4: Remaining Sediment Contamination

| Location ID | PWEXBM02 031 | PWEXBM02 035 | PWEXBM02 042 | PWEXBM02047 |
|---|---|---|---|---|
| **Cell Location** | **Cell 3** | **Cell 4** | **Cell 5A** | **Cell 6A** |
| **Sample Date** | **10/17/2016** | **10/31/2016** | **12/8/2016** | **12/8/2016** |
| **SDG** | **R1611025-003** | **R1611543-004** | **R1612959-001** | **R1700210-002** |
| **Units** | **(ug/kg)** | **(ug/kg)** | **(ug/kg)** | **(ug/kg)** |
| **Parameter** | | | | |
| 2-Methylnaphthalene | 15000 U | **4000** | **25000** | 57000 U |
| Acenaphthene | **30000** | **5500** | **33000** | 57000 U |
| Acenaphthylene | 15000 U | 2400 U | 11000 U | 57000 U |
| Anthracene | **51000** | **3700** | **32000** | **160000** |
| Benzo(a)anthracene | **62000** | 2400 U | **26000** | **260000** |
| Benzo(a)pyrene | **52000** | 2400 U | **21000** | **270000** |
| Benzo(b)fluoranthene | **52000** | 2400 U | **22000** | **290000** |
| Benzo(g,h,i)perylene | **26000** | 2400 U | **12000** | **190000** |
| Benzo(k)fluoranthene | **21000** | 2400 U | 11000 U | **100000** |
| Chrysene | **48000** | 2400 U | **21000** | **260000** |
| Dibenzo(a,h)anthracene | 15000 U | 2400 U | 11000 U | 57000 U |
| Fluoranthene | **150000** | **3800** | **59000** | **740000** |
| Fluorene | **32000** | **3900** | **29000** | **75000** |
| Indeno(1,2,3-cd)pyrene | **33000** | 2400 U | **13000** | **180000** |
| Naphthalene | 15000 U | **8400** | **59000** | 57000 U |
| Phenanthrene | **160000** | **14000** | **94000** | **830000** |
| Pyrene | **110000** | 2400 U | **45000** | **710000** |
| tPAH17 | **827000** | **43300** | **491000** | **4065000** |

**Notes:**

This is a summary table. Only detected analytes are presented.

U = Not detected above given laboratory reporting limit.

**Bold = Detected above reporting limit.**

Orange highlighted cells exceed the Record of Decision (ROD) remediation goal for tPAH17 of 43 mg/kg

ug/kg = Micrograms per kilogram

Table 5: Post Remediation Sampling Requirements and Schedule

| Sampling Location | Analytical Parameters | | | Schedule |
|---|---|---|---|---|
| | **BTEX** | PAHs | Total Cyanide | |
| TMW-1D | X | X | X | Quarterly |
| TMW-2DR | X | X | X | Quarterly |
| PRMW-01S | X | X | X | Quarterly |
| PRMW-02S | X | X | X | Quarterly |
| PRMW-02D | X | X | X | Quarterly |
| PRMW-03S | X | X | X | Quarterly |
| PRMW-03D | X | X | X | Quarterly |
| PRMW-04S | X | X | X | Quarterly |
| PRMW-05S | X | X | X | Quarterly |
| PRMW-05D | X | X | X | Quarterly |
| PRMW-06S | X | X | X | Quarterly |
| PRMW-06D | X | X | X | Quarterly |

**Notes:**

1. BTEX analytical testing SW 846 Method 8260
2. PAHs analytical testing SW 846 Method 8270
3. Total Cyanide analytical testing SW 846 9012

Table 6: Monitoring Well Construction Details

| Monitoring Well ID | Well Location | Well Purpose | Northing | Easting | Well Diameter (inches) | Screened Interval (ft bgs) | Elevation (above mean sea level) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Top of Protective Casing | Top of PVC | Ground Surface | Screen Top | Screen Bottom |
| TMW-1D | Off-Site | Adjacent to building - NE | 969049.3 | 693497.4 | 2 | 54-65 | 723.83 | 723.45 | 723.8 | 669.8 | 658.8 |
| TMW-2DR | On-Site | Adjacent to building - SW | 968990.9 | 693431.1 | 2 | 50-60 | 719.51 | 719.23 | 719.5 | 669.5 | 659.5 |
| PRMW-01S | On-Site | Upgradient | 969029.5 | 693293.4 | 2 | 20-30 | 731.46 | 731.11 | 731.5 | 711.5 | 701.5 |
| PRMW-02S | On-Site | Upgradient | 969080.7 | 693383.5 | 2 | 10-20 | 734.68 | 734.55 | 731.5 | 721.5 | 711.5 |
| PRMW-02D | On-Site | Upgradient | 969084.6 | 693380.3 | 2 | 25-35 | 734.88 | 734.64 | 731.8 | 706.8 | 696.8 |
| PRMW-03S | On-Site | Adjacent to building - NW | 969032.7 | 693434.5 | 2 | 10-20 | 723.91 | 723.73 | 720.9 | 710.9 | 700.9 |
| PRMW-03D | On-Site | Adjacent to building - NW | 969037.7 | 693433.2 | 2 | 25-35 | 723.95 | 723.81 | 721.0 | 696.0 | 686.0 |
| PRMW-04S | On-Site | Downgradient | 968897.4 | 693373.3 | 2 | 14-24 | 722.07 | 721.92 | 719.1 | 705.1 | 695.1 |
| PRMW-05S | On-Site | Downgradient | 968943.5 | 693460.2 | 2 | 10-20 | 720.94 | 720.72 | 718.1 | 708.1 | 698.1 |
| PRMW-05D | On-Site | Downgradient | 968946.6 | 693464.3 | 2 | 20-30 | 720.86 | 720.74 | 718.0 | 698.0 | 688.0 |
| PRMW-06S | On-Site | Downgradient | 968993.9 | 693519.0 | 2 | 10-20 | 721.28 | 721.10 | 717.9 | 707.9 | 697.9 |
| PRMW-06D | On-Site | Downgradient | 968997.6 | 693516.1 | 2 | 24-34 | 721.37 | 721.22 | 718.5 | 694.5 | 684.5 |

Table 7: Soil and Engineered Cover System Monitoring Requirement and Schedule

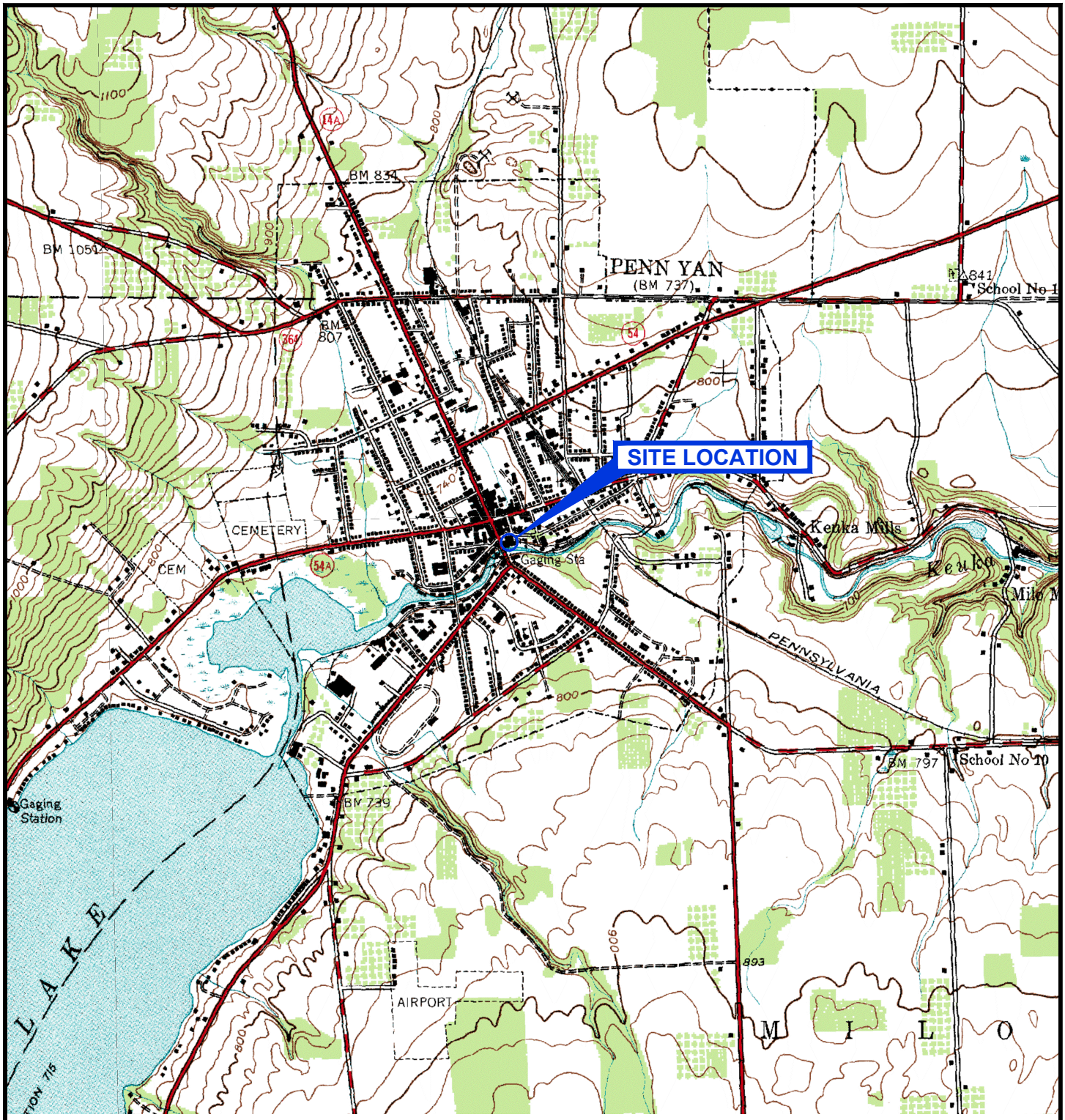
| Monitoring Event | Frequency | Monitoring Locations | Measurment/Analysis |
|---|---|---|---|
| Soil and engineered cover | Annual | On the cover areas as shown on Figure 8A and 8B | Visual inspect road surface, sidewalk surface, as well as the site surface for signs of unauthorized excavations |

Table 8: Schedule of Monitoring/Inspection Reports

| Task/Report | Reporting Frequency |
|---|---|
| Groundwater Monitoring Reports | Quarterly, for the first five years, after five years the frequency will be revised in consultation with the Department |
| Sediment Monitoring Report | Biennially, for the first five years, after five years the frequency will be revised in consultation with the Department |
| Periodic Review Report | Annually, for the first five years, after five years the frequency will be revised in consultation with the Department |

**Notes:**

The frequency of events will be conducted as specifed until otherwise approved by the NYSDEC.




UNITED STATES GEOLOGIC SURVEY
PENN YAN QUADRANGLE
NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHY)

PENN YAN, NY.
1983
PHOTOREVISED 1995

SCALE 1:24000

1 0 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

N

AECOM

| | | | | |
|---|---|---|---|---|
| PENN YAN WATER STREET FORMER MGP SITE<br>SITE MANAGEMENT PLAN | | | **SITE LOCATION MAP** | |
| DATE: DEC. 2022 | DRWN: | | | **FIGURE 1** |

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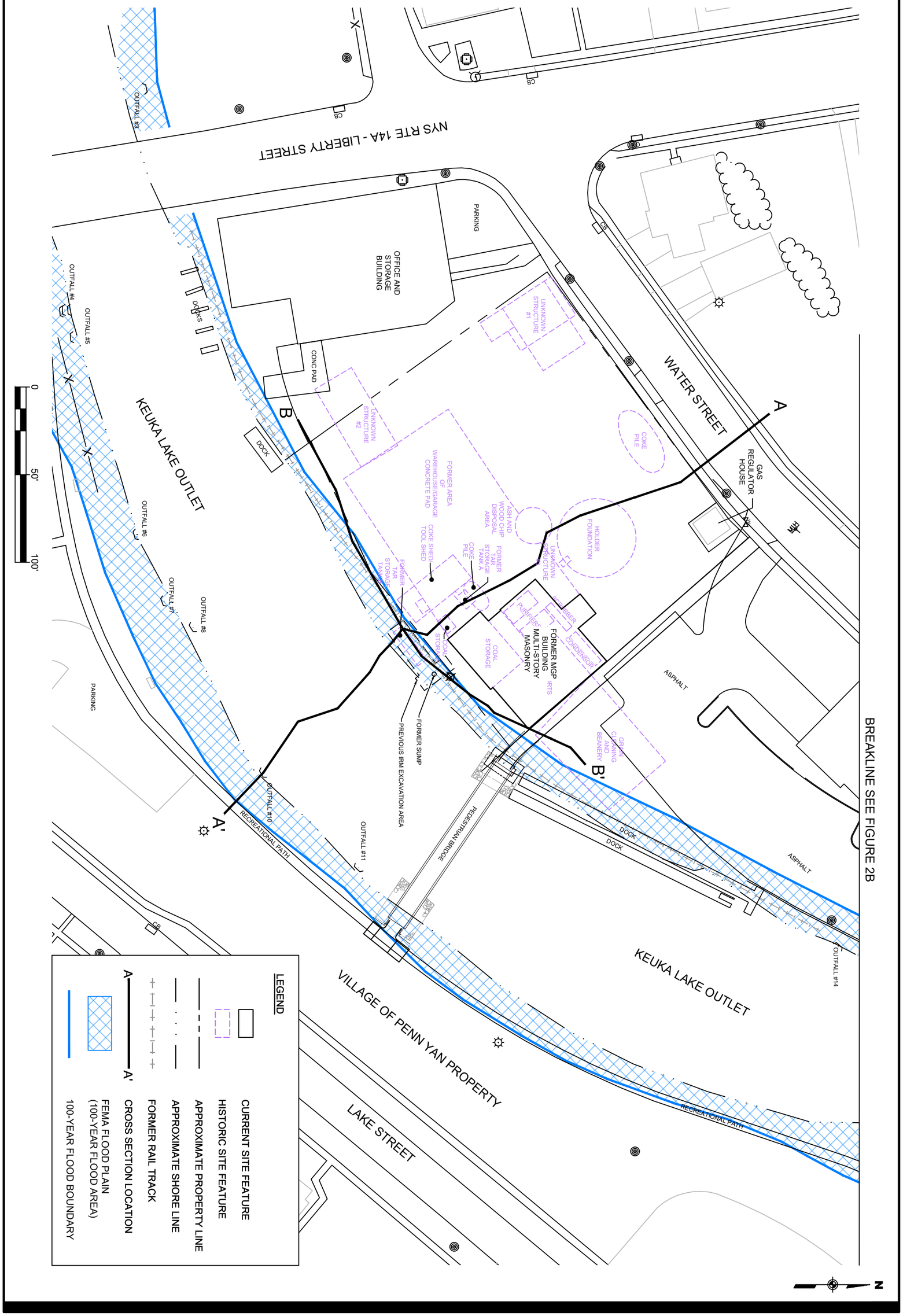


**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**SITE MAP**
**1 OF 2**

AECOM
**Figure: 2A**

LEGEND

- CURRENT SITE FEATURE
- HISTORIC SITE FEATURE
- APPROXIMATE PROPERTY LINE
- APPROXIMATE SHORE LINE
- FORMER RAIL TRACK
- A — A' CROSS SECTION LOCATION
- FEMA FLOOD PLAIN (100-YEAR FLOOD AREA)
- 100-YEAR FLOOD BOUNDARY

WAGNER STREET
MAIN STREET
MAIN STREET BRIDGE
WATER STREET
KEUKA LAKE OUTLET
KEUKA LAKE OUTLET COMPACT
LAKE LEVEL CONTROL GATES
DRIVEWAY
RECREATIONAL PATH
PARKING
CB
MH
OUTFALL #20
OUTFALL #19
OUTFALL #18
OUTFALL #17
OUTFALL #16
OUTFALL #15

BREAKLINE SEE FIGURE 2A

0 50' 100'

N

AECOM

Figure: 2B

SITE MAP
2 OF 2

**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

Project Management Initials: Designer: Checked: Approved: ANSI B 11" x 17"

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NORTH

A

SOUTH

A'

WATER STREET

PROPERTY LINE

MW5S

FORMER GAS HOLDER

FORMER WAREHOUSE GARAGE

ASH AND WOOD CHIP DISPOSAL AREA

TAR STORAGE TANK A

COAL STORAGE

LIMIT OF EXCAVATION

TAR STORAGE TANK B

RECREATION PATH

KEUKA LAKE OUTLET

EDGE OF SHORE

EDGE OF SHORE

SB23

TP1W

SB14

SB29

SB13

SB12

MW3S

TP5

SB21

T31

SDC01

SDC02

SDC03

OUTFALL G

PIPE

OUTFALL

FILL

SILT

CLAY

SAND

SILTY SAND AND GRAVEL

735
730
725
720
715
710
705
700
695
690

0 30 60 90 120 150 180 210 240 270 300 330 360 390

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

LEGEND

- FILL
- SILT
- CLAY
- SAND
- SILTY SAND AND GRAVEL
- CONCRETE
- MONITORING WELL SCREEN
- SOIL BORING OR VIBRACORE SAMPLE
- FORMER STRUCTURE LOCATION
- DIRECT CONTACT
- INFERRED CONTACT
- SEDIMENT SURFACE
- OUTLET ELEVATION
- GROUNDWATER ELEVATION OCTOBER 25, 2006
- LABORATORY SAMPLE RANGE
- SUMP
- SURVEYED LIMITS OF EXCAVATION / DREDGING

NOTES:

1. THE DESCRIPTIONS AND COLORED PORTIONS OF THE FIGURE ARE GENERAL IN NATURE AND ARE BASED ON A LIMITED NUMBER OF SAMPLES. REFER TO THE BORING LOGS AND THE RESULTS OF THE CHEMICAL ANALYSES FOR SPECIFIC INFORMATION REGARDING THE SUBSURFACE GEOLOGICAL UNITS AND THE DISTRIBUTION OF ANALYTICAL COMPOUNDS.
2. SECTION IS POINT TO POINT.

AECOM

Figure: 3A

CROSS-SECTION A-A'

SITE MANAGEMENT PLAN
WATER STREET MANUFACTURED GAS PLANT
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

Project Management Initials: Designer: Checked: Approved: ANSI B 11" x 17"

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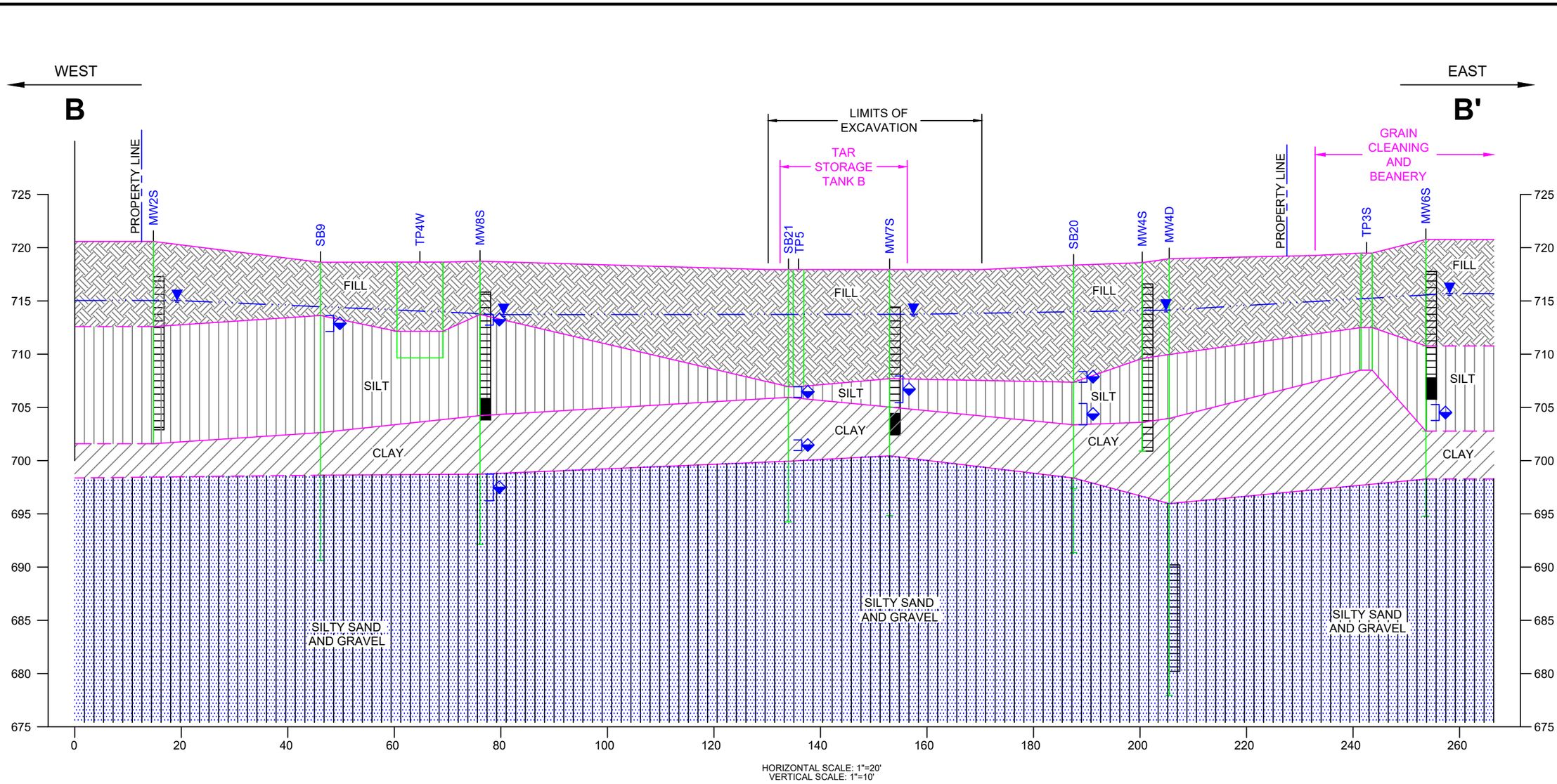



LEGEND

- FILL
- SILT
- CLAY
- SAND
- SILTY SAND AND GRAVEL
- CONCRETE
- MONITORING WELL SCREEN
- SOIL BORING OR VIBRACORE SAMPLE
- FORMER STRUCTURE LOCATION
- DIRECT CONTACT
- INFERRED CONTACT
- SEDIMENT SURFACE
- OUTLET ELEVATION
- GROUNDWATER ELEVATION OCTOBER 25, 2006
- LABORATORY SAMPLE RANGE
- SUMP
- SURVEYED LIMITS OF EXCAVATION / DREDGING

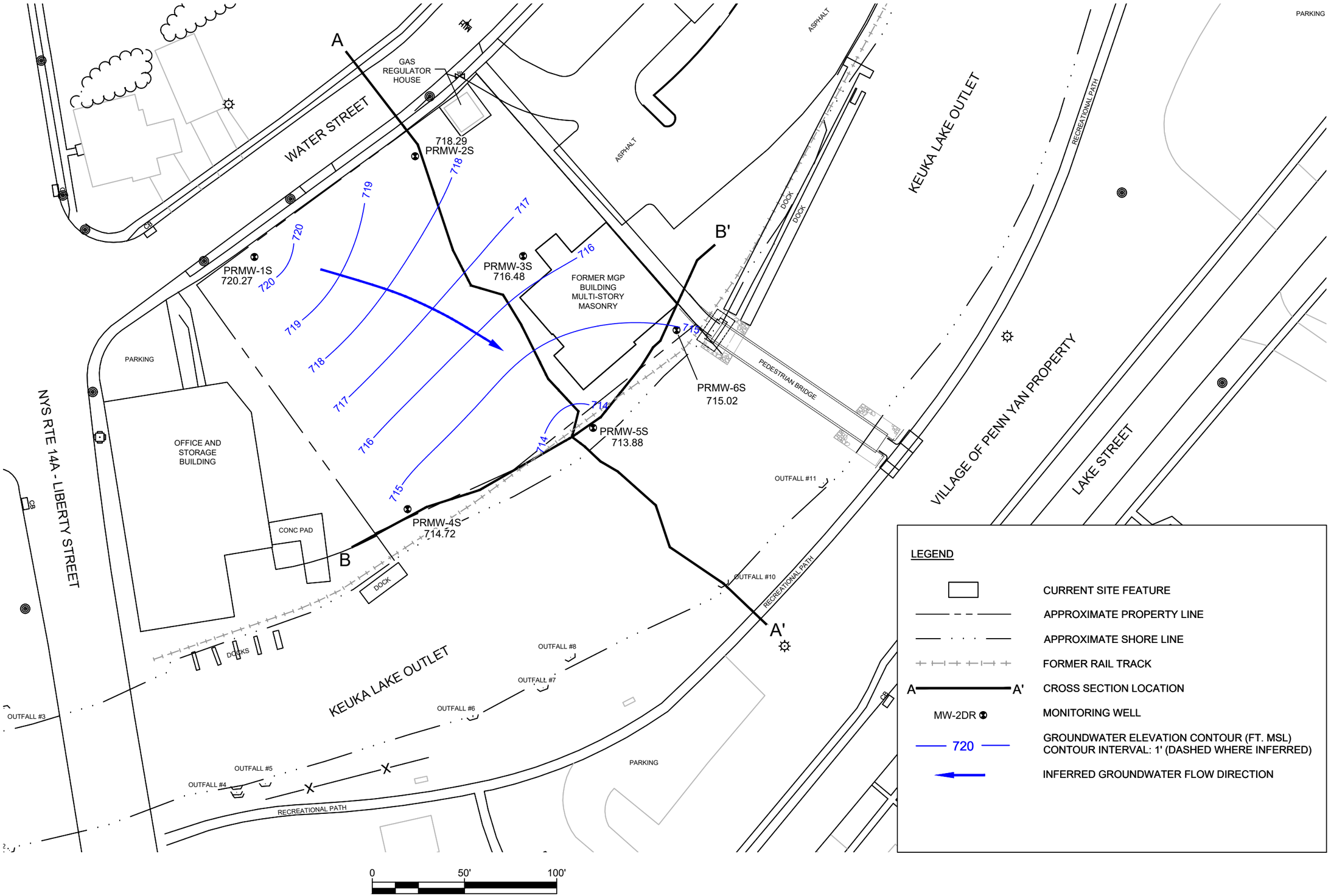
NOTES:
1. THE DESCRIPTIONS AND COLORED PORTIONS OF THE FIGURE ARE GENERAL IN NATURE AND ARE BASED ON A LIMITED NUMBER OF SAMPLES. REFER TO THE BORING LOGS AND THE RESULTS OF THE CHEMICAL ANALYSES FOR SPECIFIC INFORMATION REGARDING THE SUBSURFACE GEOLOGICAL UNITS AND THE DISTRIBUTION OF ANALYTICAL COMPOUNDS.
2. SECTION IS POINT TO POINT.

AECOM

Figure: 3B

CROSS-SECTION B-B'

SITE MANAGEMENT PLAN
WATER STREET MANUFACTURED GAS PLANT
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022




AECOM

**Figure: 4A**

**SHALLOW AQUIFER GROUNDWATER CONTOUR MAP (2022 Q3)**

**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

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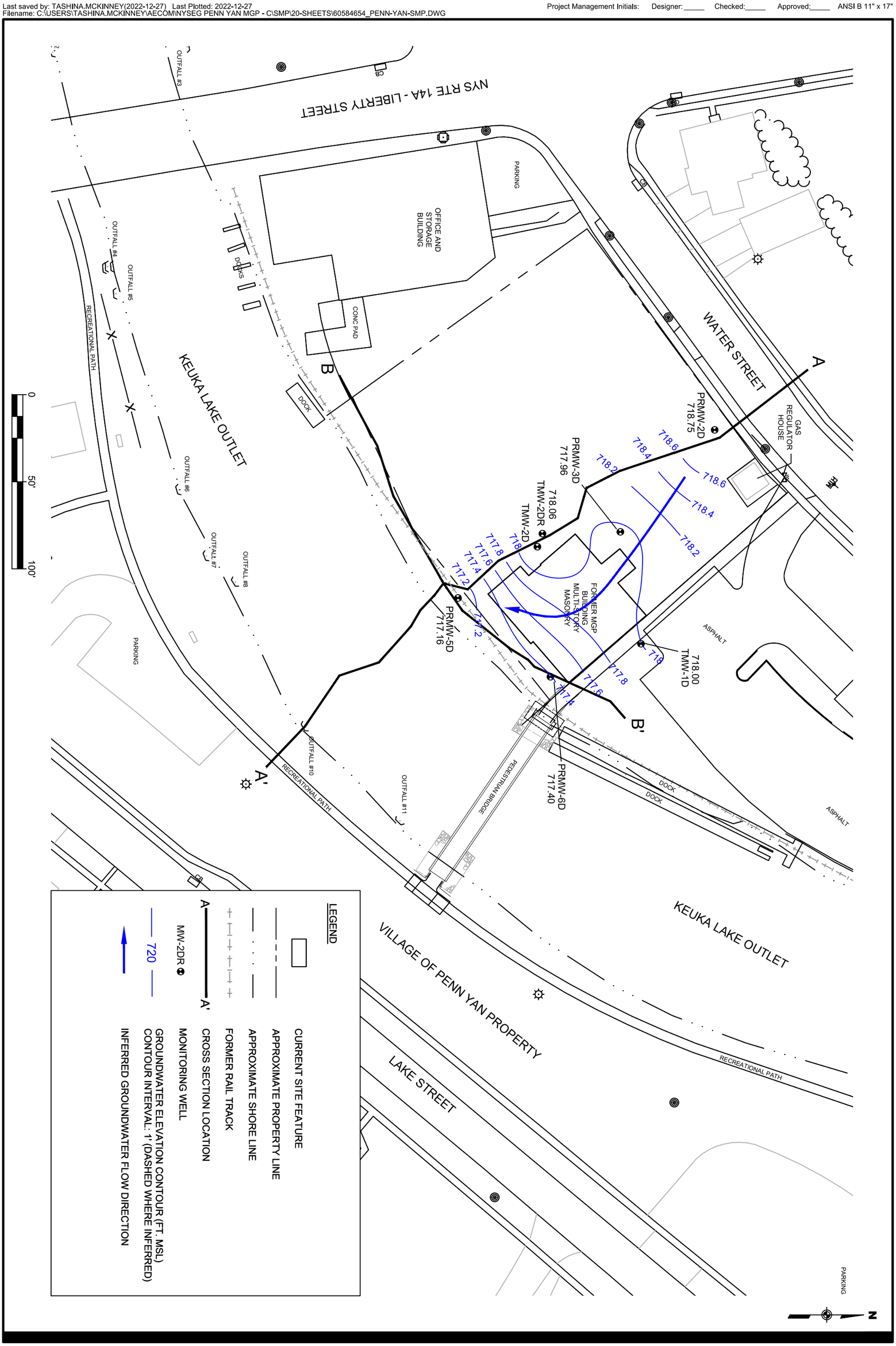


**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**DEEP AQUIFER GROUNDWATER CONTOUR MAP (2022 Q3)**

AECOM

**Figure: 4B**

PRMW-2S
PRMW-2D
ASPHALT
TMW-1D
PWEXBM04075
PWEXSWNA152
PWEXSWNA088
PWEXSWNA080
PRMW-3D
PRMW-3S
PWEXSWNA096
PWEXSWNA093
PWEXSWNA081
PWEXBM04101
PWEXSWNA082
PWEXSWNA101
FORMER MGP BUILDING
MULTI-STORY MASONRY
PWEXSWNA109
PWEXSWNA114
TMW-2DR
TMW-2D
PWEXSWNA120
PWEXSWNA121
PRMW-6D
PWEXSWNA127
PRMW-6S
PWEXSWNA076
PWEXSWNA150
DOCK
DOCK
PWEXBM02 047
KEUKA LAKE OUTLET
PEDESTRIAN BRIDGE
FORMER SUMP
PRMW-5D
PRMW-5S
PREVIOUS IRM EXCAVATION AREA
N
0
20'
40'

LEGEND

- CURRENT SITE FEATURE
- APPROXIMATE PROPERTY LINE
- APPROXIMATE SHORE LINE
- FORMER RAIL TRACK
- PWEXSWNA120 — REMAINING CONTAMINATION IN SOIL LOCATION

AECOM

Figure: 5

REMAINING SOIL CONTAMINATION

SITE MANAGEMENT PLAN
WATER STREET MANUFACTURED GAS PLANT
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

Project Management Initials: Designer:____ Checked:____ Approved:____ ANSI B 11" x 17"

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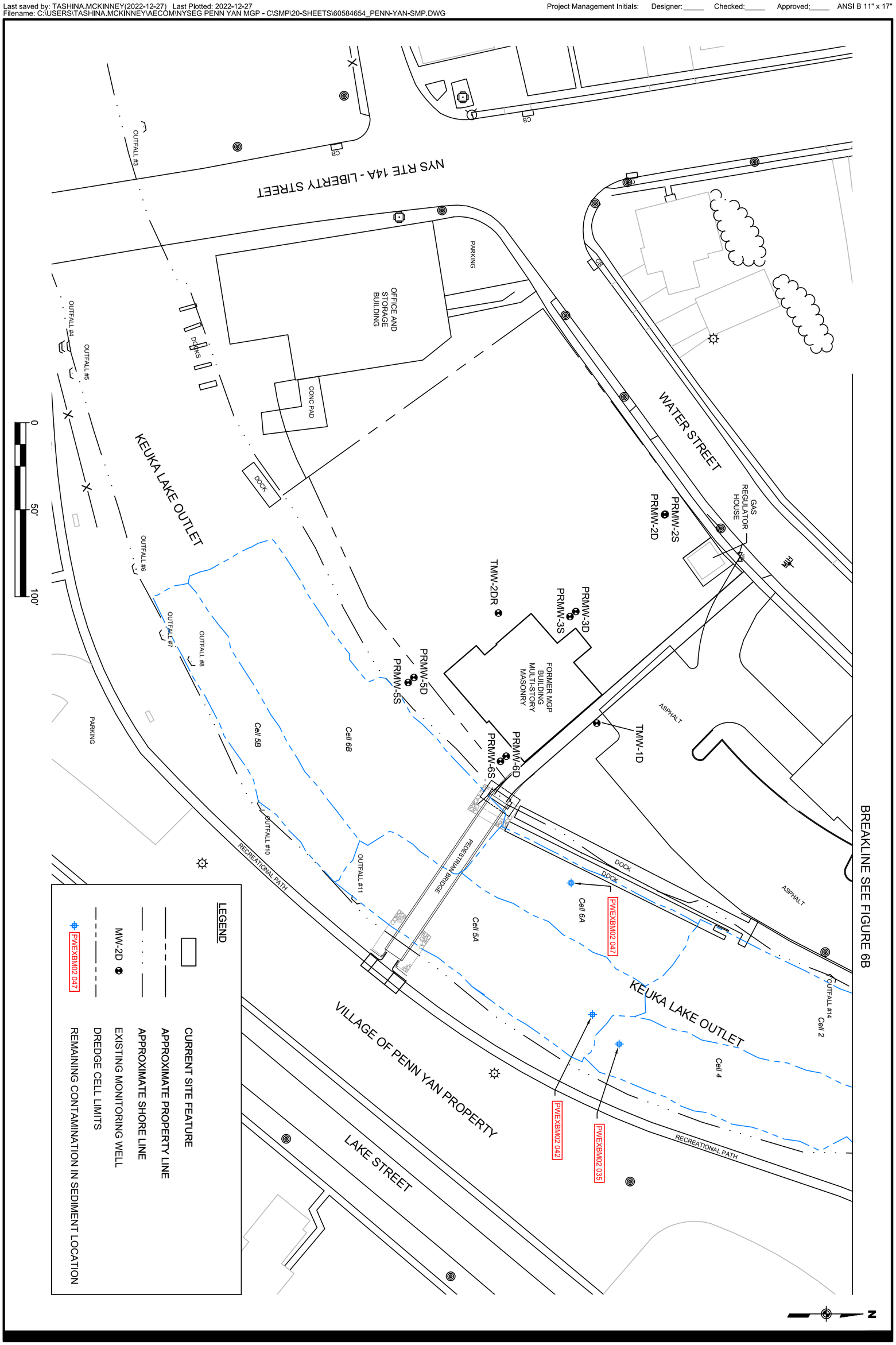
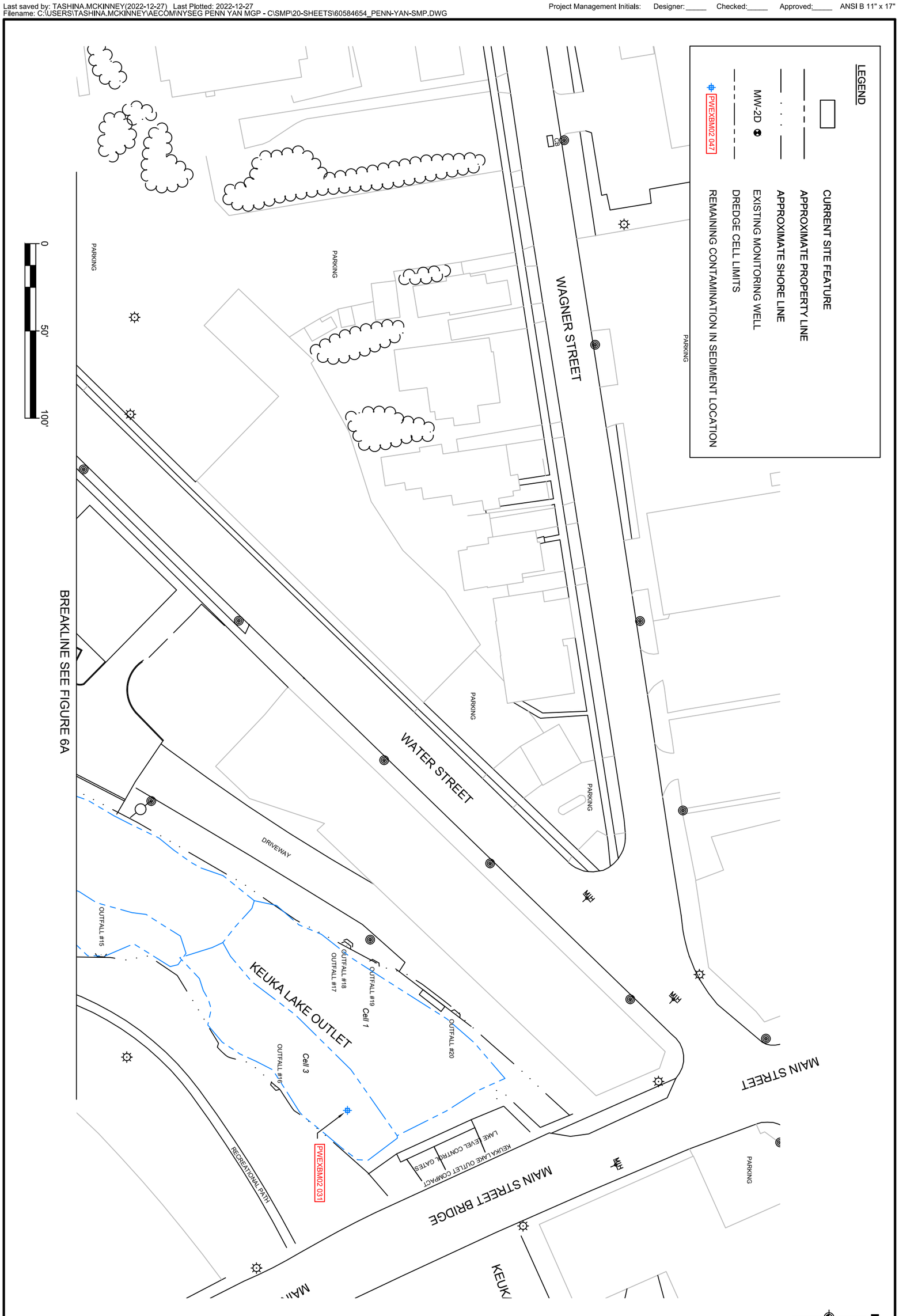



**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**REMAINING SEDIMENT CONTAMINATION**
**1 OF 2**

AECOM
**Figure: 6A**




**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**REMAINING SEDIMENT CONTAMINATION**
**2 OF 2**

AECOM
**Figure: 6B**

PRMW-2S
PRMW-2D
ASPHALT
TMW-1D
PRMW-3D
PRMW-3S
FORMER MGP BUILDING
MULTI-STORY MASONRY
DOCK
DOCK
KEUKA LAKE OUTLET
TMW-2DR
TMW-2D
PRMW-6D
PRMW-6S
PEDESTRIAN BRIDGE
FORMER SUMP
PRMW-5D
PRMW-5S
PREVIOUS IRM EXCAVATION AREA

LEGEND

- CURRENT SITE FEATURE
- APPROXIMATE PROPERTY LINE
- APPROXIMATE SHORE LINE
- FORMER RAIL TRACK
- AREA OF VAPOR INTRUSION CONCERN
- MW-2D — EXISTING MONITORING WELL

0 20' 40'

N

AECOM

**Figure: 7**

**EXISTING STRUCTURE WITH POTENTIAL FOR IMPACTION FROM SOIL VAPOR INTRUSION**

**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

Project Management Initials: Designer:____ Checked:____ Approved:____ ANSI B 11" x 17"

Last saved by: TASHINA.MCKINNEY(2022-12-27) Last Plotted: 2022-12-27
Filename: C:\USERS\TASHINA.MCKINNEY\AECOM\NYSEG PENN YAN MGP - OSMP\20-SHEETS\60584654_PENN-YAN-SMP.DWG

Last saved by: TASHINA.MCKINNEY(2022-12-27) Last Plotted: 2022-12-27
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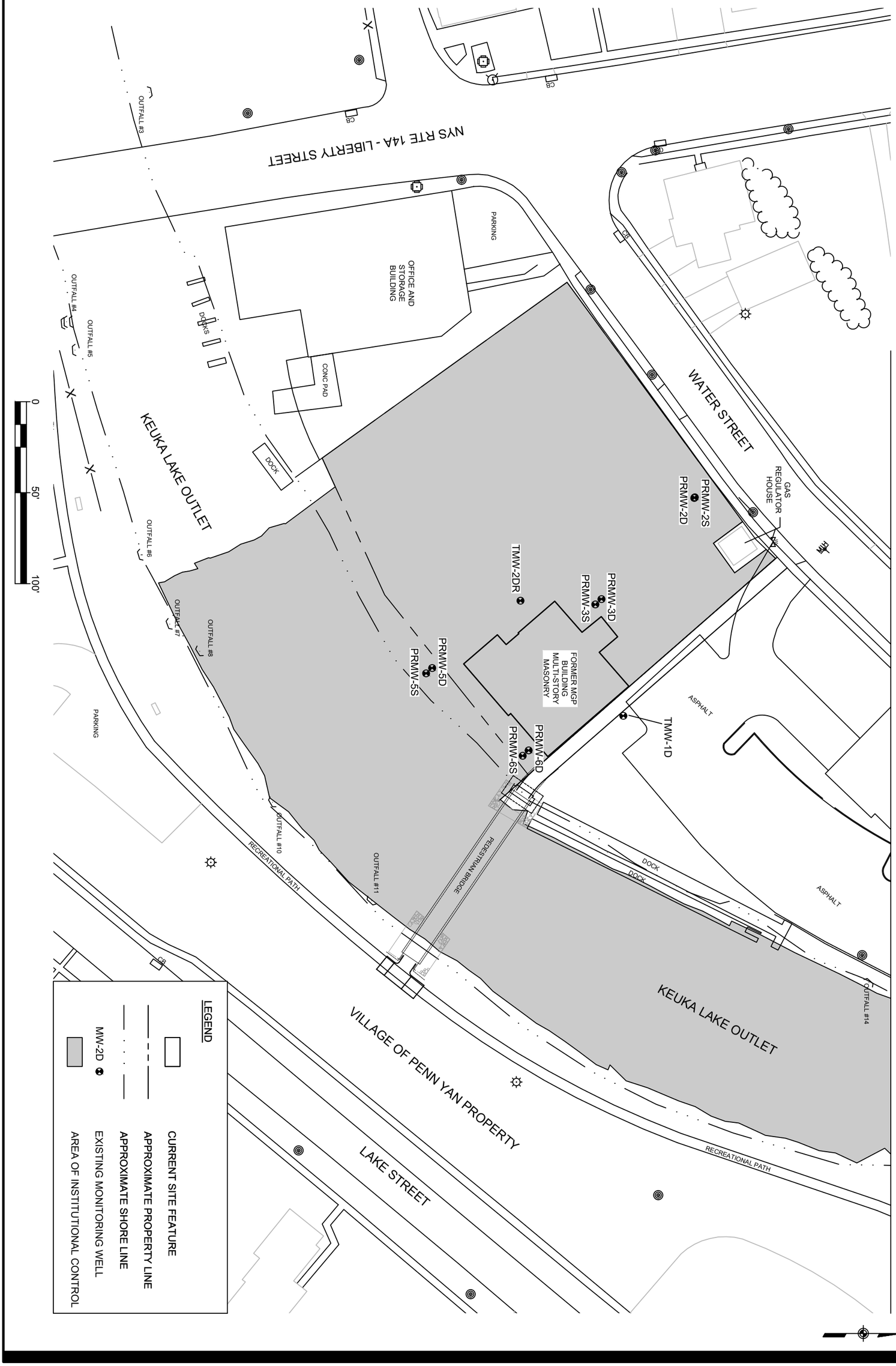
Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI B 11" x 17"



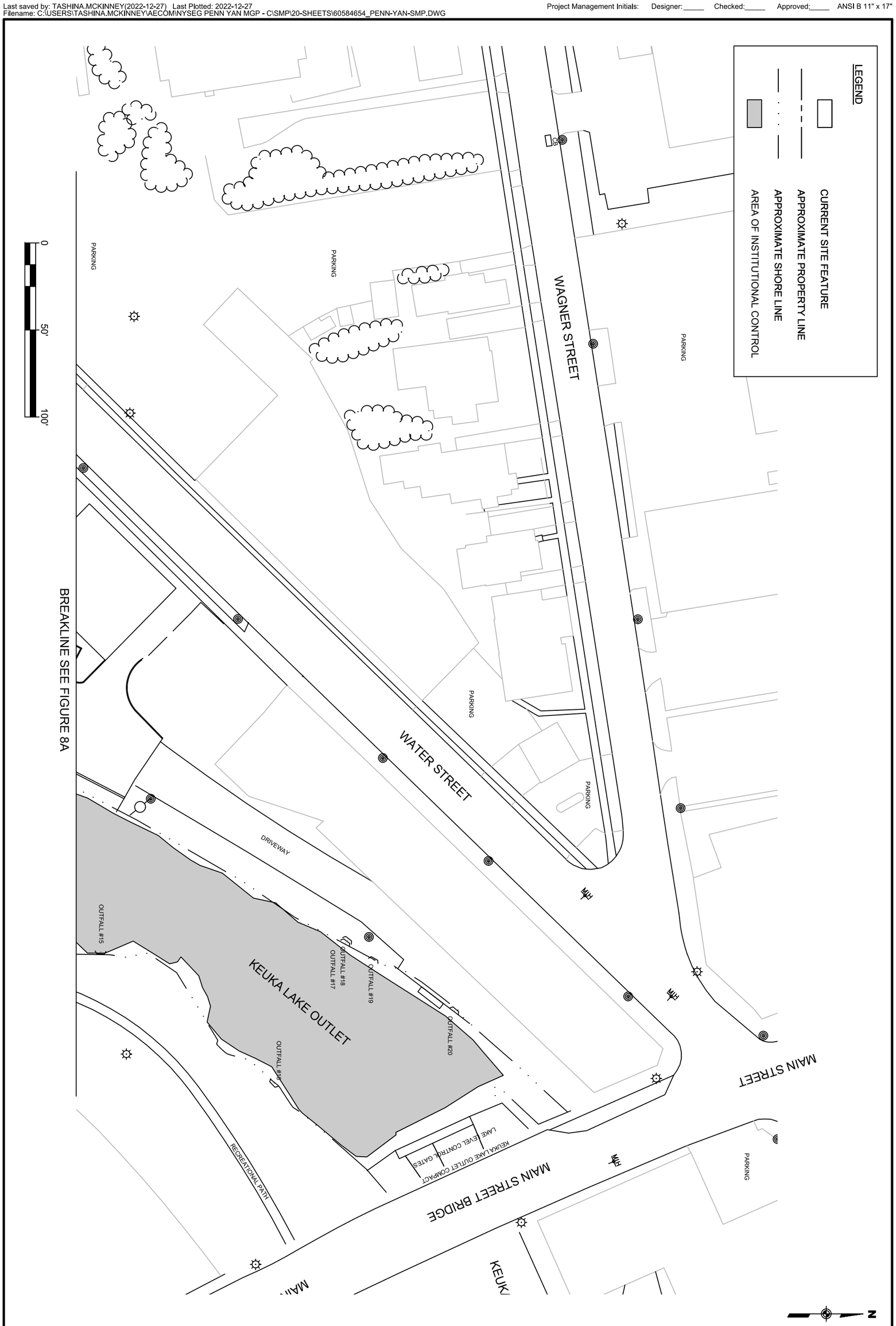

**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**INSTITUTIONAL CONTROL BOUNDARIES**
**1 OF 2**

AECOM
**Figure: 8A**

Last saved by: TASHINA.MCKINNEY(2022-12-27) Last Plotted: 2022-12-27
Filename: C:\USERS\TASHINA.MCKINNEY\AECOM\NYSEG PENN YAN MGP - C\SMP\20-SHEETS\60584654_PENN-YAN-SMP.DWG

Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI B 11" x 17"



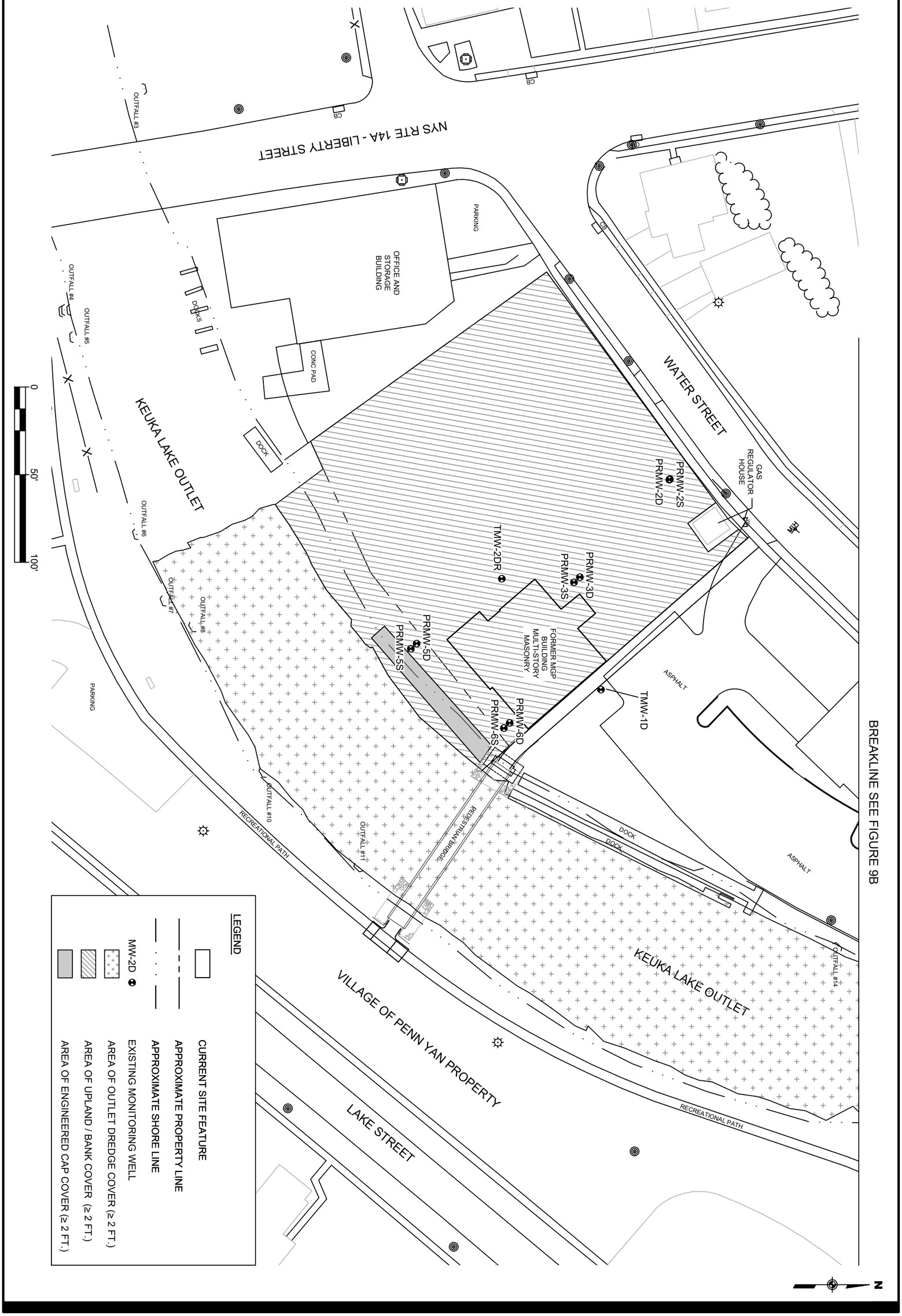

**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**INSTITUTIONAL CONTROL BOUNDARIES**
**2 OF 2**

AECOM
**Figure: 8B**

Last saved by: TASHINA.MCKINNEY(2022-12-27) Last Plotted: 2022-12-27
Filename: C:\USERS\TASHINA.MCKINNEY\AECOM\NYSEG PENN YAN MGP - C\SMP\20-SHEETS\60584654_PENN-YAN-SMP.DWG

Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI B 11" x 17"




**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

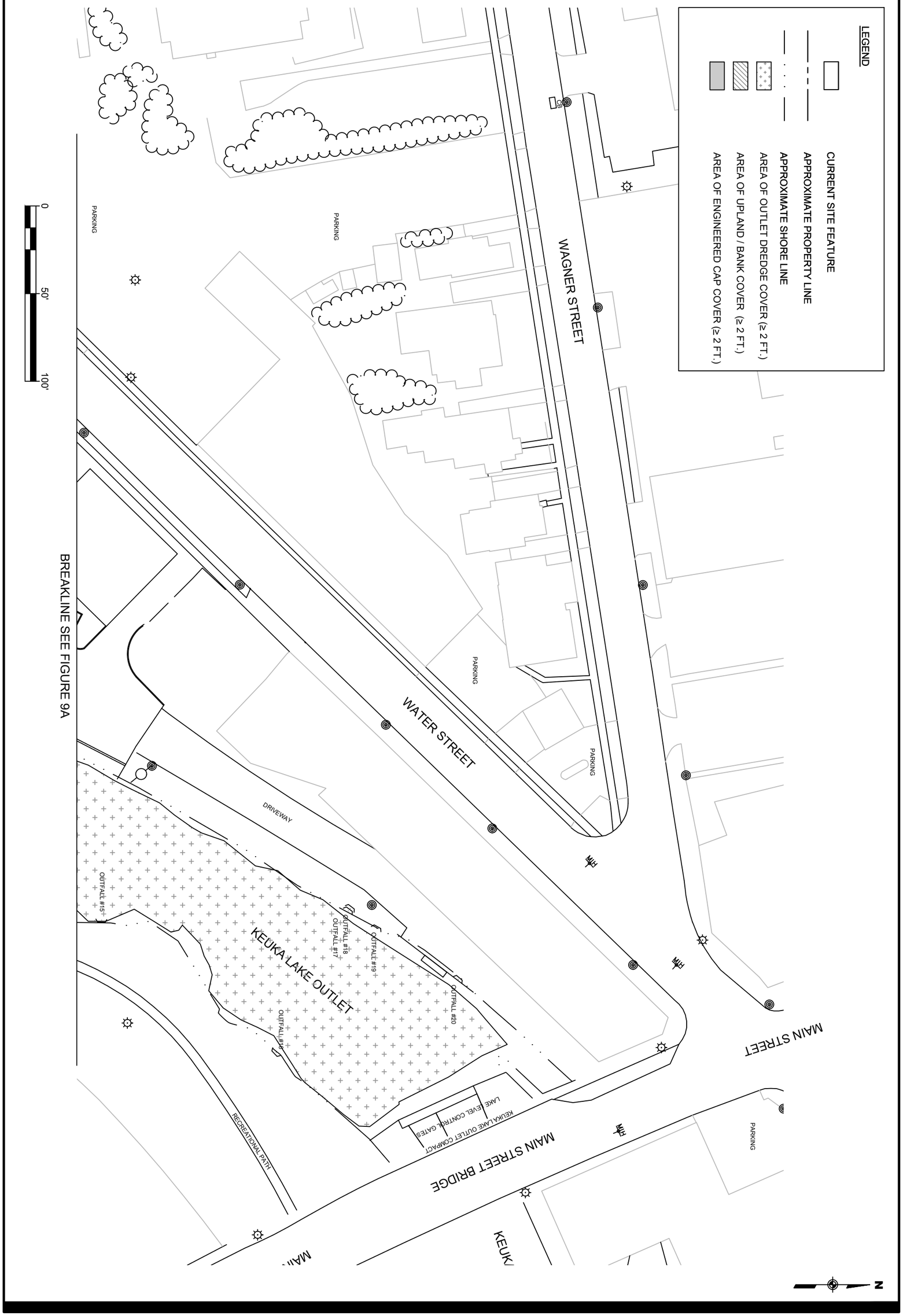
**ENGINEERING CONTROL LOCATIONS**
**1 OF 2**

AECOM

**Figure: 9A**

Last saved by: TASHINA.MCKINNEY(2022-12-27) Last Plotted: 2022-12-27
Filename: C:\USERS\TASHINA.MCKINNEY\AECOM\NYSEG PENN YAN MGP - C\SMP\20-SHEETS\60584654_PENN-YAN-SMP.DWG

Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI B 11" x 17"



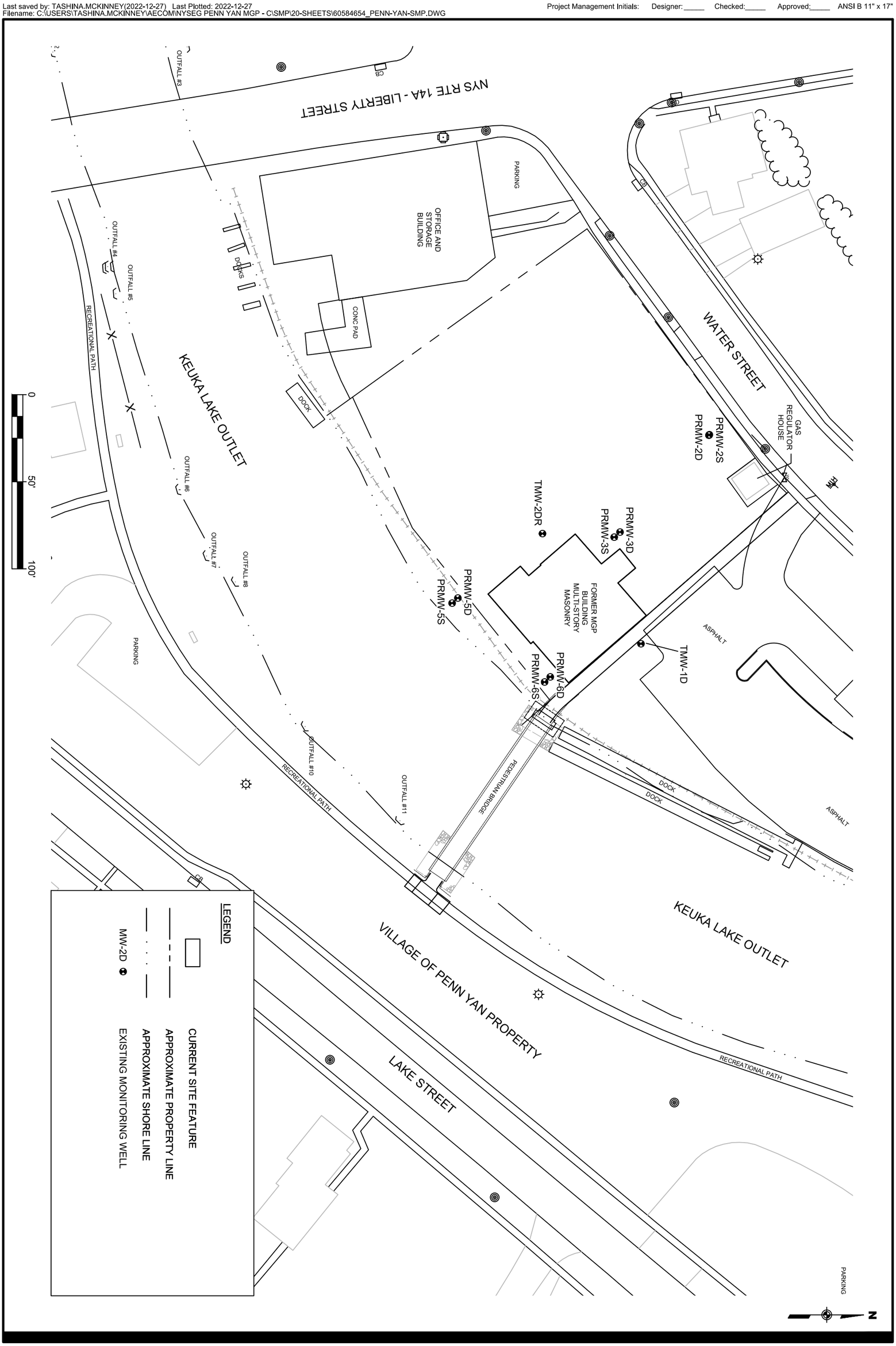

**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**ENGINEERING CONTROL LOCATIONS**
**2 OF 2**

AECOM
**Figure: 9B**

Last saved by: TASHINA.MCKINNEY(2022-12-27) Last Plotted: 2022-12-27
Filename: C:\USERS\TASHINA.MCKINNEY\AECOM\NYSEG PENN YAN MGP - C\SMP\20-SHEETS\60584654_PENN-YAN-SMP.DWG

Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI B 11" x 17"




**SITE MANAGEMENT PLAN**
**WATER STREET MANUFACTURED GAS PLANT**
VILLAGE OF PENN YAN, YATES COUNTY, NEW YORK
Project No.: 60673533 Date: DECEMBER 2022

**MONITORING WELL NETWORK**

AECOM

**Figure: 10**

# APPENDIX A – ENVIRONMENTAL EASEMENT

BARCLAY DAMON LLP

**Danielle E. Mettler-LaFeir**
*Partner*

October 11, 2022

***VIA UPS OVERNIGHT***

Cheryl Salem
New York State Department
of Environmental Conservation
Office of General Counsel
625 Broadway, 14th Floor
Albany, NY 12233-1500

Re: Recorded Environmental Easement & Municipal Notice
NYSEG – Penn Yan Water Street MGP Site
Site No. 862009

Dear Ms. Salem:

Enclosed please find the following document associated with the above referenced matter:

- Copy of Municipal Notice Letter;
- Recorded Environmental Easement; and,
- Certified Mail Delivery Receipt.

Very truly yours,

*Danielle E. Mettler-LaFeir*

Danielle E. Mettler-LaFeir

Enclosures

BARCLAY DAMON LLP

**Danielle E. Mettler-LaFeir**
*Partner*

September 23, 2022

**CERTIFIED MAIL RETURN RECEIPT REQUESTED**

Danny Condella, Mayor
Village of Penn Yan
111 Elm Street
P.O. Box 426
Penn Yan, New York 14527

Re: Environmental Easement Notice

Dear Mayor Condella:

Attached please find a copy of an environmental easement granted to the New York State Department of Environmental Conservation ("Department")

on August 25, 2022
by New York State Electric & Gas Corporation,
for property located between Water Street and the Keuka Lake Outlet Penn Yan, New York,
Tax Map Nos. 049.75-1-56, 049.75-1-55
DEC Site No: 862009.

This Environmental Easement restricts future use of the above-referenced property to restricted-residential, commercial or industrial use. Any on-site activity must be done in accordance with the Environmental Easement and the Site Management Plan which is incorporated into the Environmental Easement.

Article 71, Section 71-3607 of the New York State Environmental Conservation Law requires that:

> 1. Whenever the department is granted an environmental easement, it shall provide each affected local government with a copy of such easement and shall also provide a copy of any documents modifying or terminating such environmental easement.
>
> 2. Whenever an affected local government receives an application for a building permit or any other application affecting land use or development of land that is subject to an environmental easement and that may relate to or impact such

> easement, the affected local government shall notify the department and refer such application to the department. The department shall evaluate whether the application is consistent with the environmental easement and shall notify the affected local government of its determination in a timely fashion, considering the time frame for the local government's review of the application. The affected local government shall not approve the application until it receives approval from the department.

An electronic version of every environmental easement that has been accepted by the Department is available to the public at: http://www.dec.ny.gov/chemical/36045.html. Please forward this notice to your building and/or planning departments, as applicable, to ensure your compliance with these provisions of New York State Environmental Conservation Law. If you have any questions or comments regarding this matter, please do not hesitate to contact me.

Very truly yours,

*Danielle E. Mettler-LaFeir*

Danielle E. Mettler-LaFeir
Barclay Damon LLP

Enclosures

ecc: G. Pratt (NYSDEC)
J. Ruspantini (NYSEG)

# YATES – STATE OF NEW YORK
LOIS E. HALL, COUNTY CLERK
417 LIBERTY ST, SUITE 1107, PENN YAN, NEW YORK 14527

## COUNTY CLERK'S RECORDING PAGE
***THIS PAGE IS PART OF THE DOCUMENT – DO NOT DETACH***

INSTRUMENT #: 2022-9673

Receipt#: 199986
Clerk: KW
Rec Date: 09/19/2022 02:03:05 PM
Doc Grp: RP
Descrip: EASEMENT
Num Pgs: 10
Rec'd Frm: BARCLAY & DAMON

Party1: NYS ELECTRIC & GAS
Party2: NYS DEPARTMENT OF ENVIROMENTAL CONSERVATION
Town: MILO

Recording:

| | |
|---|---|
| Cover Page | 5.00 |
| Recording Fee | 65.00 |
| Cultural Ed | 14.25 |
| Records Management - Coun | 1.00 |
| Records Management - Stat | 4.75 |
| TP584 | 5.00 |
| Sub Total: | 95.00 |
| Transfer Tax | |
| Transfer Tax - State | 0.00 |
| Sub Total: | 0.00 |
| Total: | 95.00 |

**** NOTICE: THIS IS NOT A BILL ****

***** Transfer Tax *****
Transfer Tax #: 157
Transfer Tax
Consideration: 0.00

Total: 0.00

**WARNING***
*** Information may be amended during the verification process, and may not be reflected on this cover page.

THIS PAGE CONSTITUTES THE CLERK'S ENDORSEMENT, REQUIRED BY SECTION 316-a (5) & 319 OF THE REAL PROPERTY LAW OF THE STATE OF NEW YORK.

Lois E. Hall

Lois E. Hall
Yates County Clerk

Record and Return To:

BARCLAY & DAMON
FIVE STAR BANK PLAZA
100 CHESTNUT STREET
STE 2000
ROCHESTER NY 14604-9959

9/10

## ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

**THIS INDENTURE** made this 25th day of August, 2022, between Owner, New York State Electric & Gas Corporation, having an office at 89 East Avenue, County , County of Monroe, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee"), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

**WHEREAS,** the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

**WHEREAS,** the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

**WHEREAS,** the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

**WHEREAS,** Grantor, is the owner of real property located on Water Street near the Corner of Liberty Street in the Village of Penn Yan, County of Yates and State of New York, known and designated on the tax map of the County Clerk of Yates as tax map parcel numbers: 049.75-1-55 and 049.75-1-56 B, being the same as , or a portion of, that property conveyed to Grantor by the following deeds:

- Deed dated July 1, 1899 and recorded in the Yates County Clerk's Office at Liber 91, Page 88; and
- Deed dated November 1, 1990 and recorded in the Yates County Clerk's Office at Liber 369, Page 327.

The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.889 +/- acres, and is hereinafter more fully described in the Land Title Survey dated August 19, 2020 prepared by James S. Thew of Thew Associates Land Surveyors,

*Record & Return to:*
Barclay Damon LLP
2000 Five Star Bank Plaza
100 Chestnut Street
Rochester, NY 14604

which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

**WHEREAS**, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

**NOW THEREFORE**, in consideration of the mutual covenants contained herein and the terms and conditions of Order on Consent Index Number: D0-0002-9309, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

**Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)**

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Yates County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be

performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

**This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.**

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee

interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: 862009
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

11. Consistency with the SMP. To the extent there is any conflict or inconsistency between the terms of this Environmental Easement and the SMP, regarding matters specifically addressed by the SMP, the terms of the SMP will control.

**Remainder of Page Intentionally Left Blank**

**IN WITNESS WHEREOF,** Grantor has caused this instrument to be signed in its name.

New York State Electric & Gas Corporation:

By: Steven Mullin

Print Name: Steven Mullin

Title: Director Env. Remediation Date: 08/17/2022

**Grantor's Acknowledgment**

STATE OF NEW YORK )
) ss:
COUNTY OF MONROE )

On the 17th day of August, in the year 2022, before me, the undersigned, personally appeared Steven Mullin, personally known to me ~~or proved to me on the basis of satisfactory evidence~~ to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ capacity(ies), and that by his/~~her/their~~ signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Elizabeth Anne Collins
Notary Public - State of New York

My commission expires August 6, 2024.

ELIZABETH ANNE COLLINS NOTARY PUBLIC STATE OF NEW YORK NO. 01CO6266695 QUALIFIED IN MONROE COUNTY

**THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK**, Acting by and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: Andrew Guglielmi
Andrew O. Guglielmi, Director
Division of Environmental Remediation

**Grantee's Acknowledgment**

STATE OF NEW YORK )
) ss:
COUNTY OF ALBANY )

On the 25 day of August, in the year 2022 before me, the undersigned, personally appeared ~~Michael J. Ryan,~~ personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Andrew Guglielmi

Jennifer Andaloro
Notary Public - State of New York

JENNIFER ANDALORO
Notary Public, State of New York
No. 02AN6098246
Qualified in Albany County
Commission Expires January 14, 2024

## SCHEDULE "A" PROPERTY DESCRIPTION

METES AND BOUNDS DESCRIPTION (AS MEASURED)
NEW YORK STATE ELECTRIC & GAS CORPORATION
PENN YAN WATER STREET
(NEAR THE CORNER OF LIBERTY STREET)
INCLUDES TAX MAP PARCELS 049.75-1-55 & 049.75-1-56

*Contains: 38,725 square feet or 0.889 acres*

All that tract or parcel of land situate in the Village of Penn Yan, County of Yates, State of New York, and being more precisely described as follows:

**Beginning** at a 5/8-inch rebar with a 1 1/4-inch diameter red plastic cap marked "THEW ASSOCIATES - UTICA NY" (herein after referred to as a 5/8-inch rebar) set on the southerly bounds of Water Street (50-foot width) at the northwesterly corner of a parcel of land conveyed by the Raymond B. Spencer and Sandra C. Spencer to the Village of Penn Yan by deed dated June 7, 2017 and recorded in the Yates County Clerk's Office on July 6, 2017 in Volume 721 of Deeds at Page 252, said rebar having New York State Plane Coordinates (NAD 83/2011 - Central Zone) of 969,131.09 feet North and 693,407.83 feet East;

thence South 41 degrees 11 minutes 35 seconds East, along the westerly line of the Village of Penn Yan, a distance of 198.38 feet, more or less, to the northerly shoreline of Kueka Lake Outlet; said course passing over 5/8-inch rebar set at the top bank at a distance of 180.59 feet;

thence westerly along the northerly shoreline of the Keuka Lake Outlet, as it winds and turns, a distance of 210 feet, more or less, to a point (chord South 54 degrees 46 minutes 04 seconds West, 208.70 feet); thence North 35 degrees 39 minutes 42 seconds West, in part along the westerly line of a parcel of land conveyed by Cindy B. Rosato to Rei Rei, LLC by deed dated February 24, 2011 and recorded in the Yates County Clerk's Office on March 3, 2011 in Volume 626 of Deeds at Page 116, a distance of 185.26 feet to a MAG Nail set on the southerly bounds of Water Street; said course passing over 5/8-inch rebar set at the top of bank at a distance of 20 feet;

thence along the southerly bounds of said Water Street, the following two courses and distances:

1. North 53 degrees 42 minutes 58 seconds East a distance of 175.20 feet to a set 5/8-inch rebar, said course passing over a 1/2-inch iron pipe (0.2 feet below grade) found at a distance of 163.15 feet;

2. North 43 degrees 53 minutes 31 seconds East a distance of 15.21 feet to the **Point of Beginning;** said course passing over a 5/8-inch rebar set at a distance of 8.06 feet;

To contain 38,725 square feet or 0.889 acres of land, more or less.

The above-described parcel of land is intended to be the same premises conveyed by William A. Rohrer to New York State Electric & Gas Corporation by deed dated November 1, 1990 and recorded in the Yates County Clerk's Office on November 5, 1990 in Volume 369 of Deeds at Page 327 and a portion of the same premises conveyed by Mary A. Conklin to The Penn Yan Gas Light Company by deed dated July 1, 1899 and recorded in the Yates County Clerk's Office on July 5, 1899 in Volume 91 of Deeds at Page 88.

# APPENDIX B – LIST OF SITE CONTACTS

| Name | Phone/Email Address |
|---|---|
| John Ruspantini, NYSEG | jjruspantini@nyseg.com |
| Carsten Floess, AECOM | Carsten.Floess@aecom.com |
| Thomas Haley, NYSDEC | Thomas.haley@dec.ny.gov |
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# APPENDIX C – MONITORING WELL BORING AND CONSTRUCTION LOGS

AECOM
40 British American Blvd
Latham, New York, 12110

# Well ID: TMW-1S



**Project Name:** NYSEG Penn Yan
**NYSEG/Project Number:** NYSEG
**Date Started/Date Completed:** 5/4/17
**Boring Location:** Upland east
**Drilling Company:** Nothnagle

**Sampling Method:** MacroCore
**PVC Elevation (ft/msl, NAVD 88):**
**Ground Elevation (ft/msl, NAVD 88):**
**Total Depth:** 44 ft
**Logged By:** KS

| Depth (Feet) | Recovery (Feet) | PID (ppm) | Sample ID | Sample Interval | Lithology | USCS | Visual Impacts | Geologic Description | Remarks | Well Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 to -2 | 3.5 | 0.0 | | | | FILL | | Brown; fine to coarse SAND, some medium to coarse gravel up to 3-inch diameter; loose, dry. | Bentonite seal at 0 to 1 ft bgs. | |
| -2 to -4 | | | | | | | | | | |
| -4 to -6 | 2.0 | 0.0 | | | | | | | Two-inch diameter PVC riser at 0 to 34 ft bgs. | |
| -6 to -8 | | | | | | | | | | |
| -8 to -10 | 3.0 | 0.0 | | | | SM | | Brown; silty fine SAND, some fine to medium gravel, some orange mottling, trace clay; compact; moist. | | |
| -10 to -12 | | | | | | | | | | |
| -12 to -14 | 0.0 | NA | | | | | | | | |
| -14 to -16 | | | | | | | | | | |
| -16 to -18 | 4.0 | 0.1 | | | | | | | Grouted annulus at 1 to 31 ft bgs. | |
| -18 to -20 | | | | | | | | | | |
| -20 to -22 | 3.5 | 0.3 | | | | CL | | Gray; CLAY, little fine to medium gravel; compact; wet. | | |
| -22 to -24 | | | | | | | | | | |
| -24 to -26 | 1.5 | 0.1 | | | | | | | Bentonite seal at 31 to 33 ft bgs. | |
| -26 to -28 | | | | | | | | | | |
| -28 to -30 | 0.0 | NA | | | | | | | | |
| -30 to -32 | | | | | | | | | | |
| -32 to -34 | 2.0 | 0.2 | | | | SM | | Brown to gray; silty fine SAND, little fine to medium gravel; compact; moist. | Sand filter pack at 33 to 44 ft bgs. | |
| -34 to -36 | | | | | | | | | | |
| -36 to -38 | 2.0 | 0.0 | | | | | | | Number 10 slot PVC screen at 34 to 44 ft bgs. | |
| -38 to -40 | | | | | | | | | | |
| -40 to -42 | 3.0 | 0.2 | | | | SP | | Brown to gray; homogenous fine SAND, trace fine gravel; loose; wet. | | |
| -42 to -44 | | | | | | | | | | |

Coal Tar or Coal Tar NAPL Saturated Soil

Hydrocarbon Staining, Hydrocarbon Sheen or NAPL Blebs

Comments:

AECOM
40 British American Blvd
Latham, New York, 12110

# Well ID: TMW-1D



**Project Name:** NYSEG Penn Yan
**NYSEG/Project Number:** NYSEG
**Date Started/Date Completed:** 5/4/17
**Boring Location:** Upland east
**Drilling Company:** Nothnagle

**Sampling Method:** MacroCore
**PVC Elevation (ft/msl, NAVD 88):**
**Ground Elevation (ft/msl, NAVD 88):**
**Total Depth:** 64 ft
**Logged By:** KS

| Depth (Feet) | Recovery (Feet) | PID (ppm) | Sample ID | Sample Interval | Lithology | USCS | Visual Impacts | Geologic Description | Remarks | Well Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| -40 | | | | | | | | See TMW-1S for the 0 to 44 ft bgs lithology. | Bentonite seal at 0 to 1 ft bgs. | |
| -42 | | | | | | | | | | |
| -44 | | | | | | SP | | Gray; homogenous fine SAND; loose; wet. | Grouted annulus at 1 to 51 ft bgs. | |
| -46 | 3.0 | 0.0 | | | | | | | | |
| -48 | | | | | | | | | | |
| -50 | 3.0 | 0.0 | | | | | | | Bentonite seal at 51 to 53 ft bgs. | |
| -52 | | | | | | | | | | |
| -54 | | | | | | | | | Sand filter pack at 53 to 64 ft bgs. | |
| -56 | 2.5 | 0.0 | | | | | | | | |
| -58 | | | | | | | | | Number 10 slot PVC screen at 54 to 64 ft bgs. | |
| -60 | | | | | | | | | | |
| -62 | 3.0 | 0.0 | | | | | | Boring terminated at 64 ft bgs. | | |
| -64 | | | | | | | | | | |

Coal Tar or Coal Tar NAPL Saturated Soil

Hydrocarbon Staining, Hydrocarbon Sheen or NAPL Blebs

Comments: See TMW-1S for the 0 to 44 ft bgs lithology.

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Latham, New York, 12110

# Well ID: TMW-2S



**Project Name:** NYSEG Penn Yan
**NYSEG/Project Number:** NYSEG
**Date Started/Date Completed:** 5/8/17
**Boring Location:** Upland west
**Drilling Company:** Nothnagle

**Sampling Method:** MacroCore
**PVC Elevation (ft/msl, NAVD 88):**
**Ground Elevation (ft/msl, NAVD 88):**
**Total Depth:** 40 ft
**Logged By:** KS

| Depth (Feet) | Recovery (Feet) | PID (ppm) | Sample ID | Sample Interval | Lithology | USCS | Visual Impacts | Geologic Description | Remarks | Well Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | |
| -2 | 1.5 | 0.0 | | | | FILL | | Brown; fine to medium SAND, some fine to coarse gravel, little silt; loose; wet. | Bentonite seal at 0 to 1 ft bgs. | |
| -4 | | | | | | | | | | |
| -6 | 2.0 | 0.0 | | | | SM | | Brown; silty fine SAND, some fine to medium gravel, little clay, trace organics; compact; dry. | Two-inch diameter PVC riser at 0 to 30 ft bgs. | |
| -8 | | | | | | | | | | |
| -10 | 4.0 | 0.0 | | | | | | | Grouted annulus at 1 to 27 ft bgs. | |
| -12 | | | | | | CL | | Gray; CLAY; soft; wet. | | |
| -14 | 0.3 | 0.0 | | | | | | | | |
| -16 | | | | | | | | | | |
| -18 | 1.0 | 0.0 | | | | | | | | |
| -20 | | | | | | SM | | Gray; SILT, some fine sand, little fine to coarse gravel, little clay; compact; moist. | | |
| -22 | 3.0 | 0.0 | | | | | | | | |
| -24 | | | | | | | | | Bentonite seal at 27 to 29 ft bgs. | |
| -26 | 2.5 | 0.0 | | | | | | | | |
| -28 | | | | | | SP | | Brown; homogenous fine SAND; loose; wet. | | |
| -30 | 4.0 | 0.0 | | | | | | | Sand filter pack at 29 to 40 ft bgs. | |
| -32 | | | | | | | | | | |
| -34 | | | | | | | | | Number 10 slot PVC screen at 30 to 40 ft bgs. | |
| -36 | 3.0 | 0.0 | | | | GP | | Brown; fine to coarse gravel, some fine to coarse sand, trace silt; loose; wet. | | |
| -38 | | | | | | | | | | |
| -40 | | | | | | | | | | |

Coal Tar or Coal Tar NAPL Saturated Soil

Hydrocarbon Staining, Hydrocarbon Sheen or NAPL Blebs

Comments:

AECOM
40 British American Blvd
Latham, New York, 12110

# Well ID: TMW-2D



**Project Name:** NYSEG Penn Yan
**NYSEG/Project Number:** NYSEG
**Date Started/Date Completed:** 5/8/17
**Boring Location:** Upland west
**Drilling Company:** Nothnagle

**Sampling Method:** MacroCore
**PVC Elevation (ft/msl, NAVD 88):**
**Ground Elevation (ft/msl, NAVD 88):**
**Total Depth:** 60 ft
**Logged By:** KS

| Depth (Feet) | Recovery (Feet) | PID (ppm) | Sample ID | Sample Interval | Lithology | USCS | Visual Impacts | Geologic Description | Well Remarks | Well Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| -36 | | | | | | | | See TMW-2S for the 0 to 40 ft bgs lithology. | Two-inch diameter PVC riser at 0 to 50 ft bgs. | |
| -38 | | | | | | | | | | |
| -40 | | | | | | SP | | Gray; homogenous fine SAND; loose; wet. | Bentonite seal at 0 to 1 ft bgs. | |
| -42 | 4.0 | 11.1<br>23.4 | | | | | | | Grouted annulus at 1 to 47 ft bgs. | |
| -44 | | | | | | | | | | |
| -46 | 4.0 | 0.1 | | | | | | | | |
| -48 | | | | | | | | | Bentonite seal at 47 to 49 ft bgs. | |
| -50 | | | | | | | | Running sands are binding the sampler. Switch to 3-inch diameter split spoons. | | |
| -52 | 2.0 | 0.0 | | | | | | | Sand filter pack at 49 to 60 ft bgs. | |
| -54 | | | | | | | | | | |
| -56 | | | | | | | | | Number 10 slot PVC screen at 50 to 60 ft bgs. | |
| -58 | 2.0 | 0.1 | | | | | | Boring terminated at 60 ft bgs. | | |
| -60 | | | | | | | | | | |

Coal Tar or Coal Tar NAPL Saturated Soil

Hydrocarbon Staining, Hydrocarbon Sheen or NAPL Blebs

Comments: See TMW-2S for the 0 to 40 ft bgs lithology.

| | | | | | |
|---|---|---|---|---|---|
| **Date Start/Finish:** | 7/13/2022 | **Northing:** | 693431.07 | **Well/Boring ID:** | **TMW-2DR** |
| **Drilling Company:** | Parratt Wolff | **Easting:** | 968990.86 | **Client:** | NYSEG |
| **Driller's Name:** | Jolann Price | **Casing Elevation:** | 719.23 ft AMSL | **Location:** | Penn Yan Water Street<br>Former MGP Site<br>Penn Yan, New York |
| **Drilling Method:** | 4.25" ID Augers | **Surface Elevation:** | 719.50 ft AMSL | | |
| **Sampling Method:** | NA | **Borehole Depth:** | 60 ft bgs | | |
| **Rig Type:** | Hollow Stem Aguer | **Descriptions By:** | K. Flemming | | |

| Depth (feet bgs) / Elevation (feet AMSL) | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|
| 720 / 0 | | | | | | | Location not logged. Refer to TMW-2D boring log for lithology. | 8" Flush-mounted Well Box; Concrete Pad (0'-1' bgs) |
| 715 / 5 | NA | NA | NA | NA | | | | 2" Dia. SCH40 PVC Riser (0'-50' bgs) |
| 710 / 10 | | | | | | | | Bentonite Cement Grout (1'-47' bgs) |
| 705 / 15 | | | | | | | | |

**Remarks:** bgs = below ground surface; ags = above ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.
Location hand cleared 0-5' bgs.

ARCADIS Design & Consultancy for natural and built assets

**Client:** NYSEG

**Well/Boring ID:** **TMW-2DR**

**Borehole Depth:** 60 ft bgs

**Site Location:**

Penn Yan Water Street
Former MGP Site
Penn Yan, New York

| Depth (feet bgs) / Elevation (feet AMSL) | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Location not logged. Refer to TMW-2D boring log for lithology. | Bentonite Cement Grout (1'-47' bgs) |
| 700 / 20 | | | | | | | | |
| 695 / 25 | NA | NA | NA | NA | | | | 2" Dia. SCH40 PVC Riser (0'-50' bgs) |
| 690 / 30 | | | | | | | | |
| 685 / 35 | | | | | | | | |

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**Remarks:** bgs = below ground surface; ags = above ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.
Location hand cleared 0-5' bgs.

**Client:** NYSEG

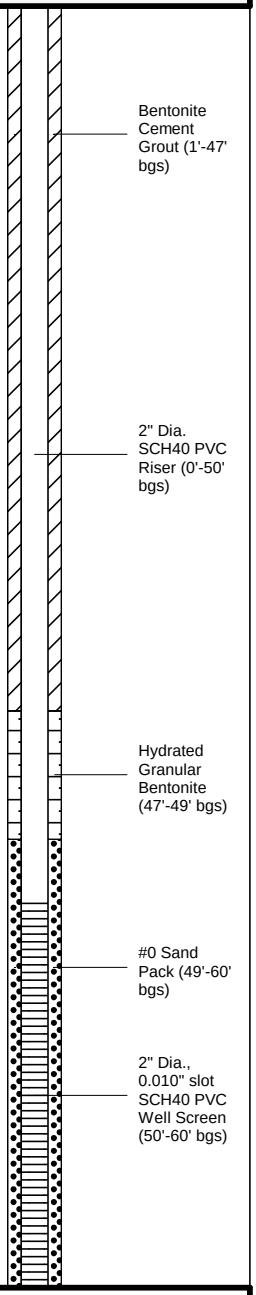
**Well/Boring ID:** **TMW-2DR**

**Borehole Depth:** 60 ft bgs

**Site Location:**

Penn Yan Water Street
Former MGP Site
Penn Yan, New York

| Depth (feet bgs) | Elevation (feet AMSL) | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Location not logged. Refer to TMW-2D boring log for lithology. | |
| | 680 | | | | | | | | |
| 40 | | | | | | | | | |
| | 675 | | | | | | | | |
| 45 | | NA | NA | NA | NA | | | | |
| | 670 | | | | | | | | |
| 50 | | | | | | | | | |
| | 665 | | | | | | | | |
| 55 | | | | | | | | | |




ARCADIS Design & Consultancy for natural and built assets

**Remarks:** bgs = below ground surface; ags = above ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.
Location hand cleared 0-5' bgs.

**Client:** NYSEG

**Well/Boring ID:** TMW-2DR

**Borehole Depth:** 60 ft bgs

**Site Location:**

Penn Yan Water Street
Former MGP Site
Penn Yan, New York

| Depth (feet bgs) / Elevation (feet AMSL) | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|
| 60 / 660 | NA | NA | NA | NA | | | Location not logged. Refer to TMW-2D boring log for lithology. | #0 Sand Pack (49'-60' bgs); 2" Dia., 0.010" slot SCH40 PVC Well Screen (50'-60' bgs) |
| 65 / 655 | | | | | | | | |
| 70 / 650 | | | | | | | | |
| 75 / 645 | | | | | | | | |

ARCADIS Design & Consultancy for natural and built assets

**Remarks:** bgs = below ground surface; ags = above ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.
Location hand cleared 0-5' bgs.

# BOREHOLE LOG

BORING ID #: PRMW-1S

AECOM

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME:** | NYSEG Penn Yan | **PROJECT NO.:** | 60648952 | **CLIENT:** | NYSEG |
| **SITE LOCATION:** | Penn Yan, NY | **BORING LOCATION:** | PRMW-1S | **DRILLING METHOD:** | Hollow Stem Auger, 4' Macrocore |
| **DRILLING CO.:** | Nothnagle | **DRILLER:** | Bryan Swartz | **TOTAL DEPTH DRILLED:** | 30' bgs |
| **BOREHOLE DIAMETER:** | 9" | **DEPTH TO BEDROCK:** | N/A | **WEATHER CONDITIONS:** | 30°F, Overcast |
| **TOTAL DEPTH REACHED:** | 30' bgs | **INSPECTOR:** | Alexandra Golden | **ELEVATION AND DATUM:** | 731.5 ft., NAD83/2011 |
| **NORTHING:** | 969029.5 | **EASTING:** | 693293.4 | **START:** 1/13/2021 | **FINISH:** 1/13/2021 |

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | - | - | | | | |
| FALL | - | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore | HSA | - | - | CME LL 55 |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

**FIELD SAMPLE INFORMATION**

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | - | - | - | N | - | N | Air knife 0.0' - 5.0'<br>0' - 0.5' Crushed Stone<br>0.5'- 2.1': Brown silty fine-medium SAND, dry; orange snow mesh encountered at 2.1'<br>2.1' - 5.0': Brown silty fine-medium SAND, little fine gravel; compact/firm | Fill<br>SM | Dry |
| 5.0 | - | 48" | 0.0 | N | - | N | Same as above (SAA) | SM | Dry |
| 9.0 | - | 48" | 0.0 | N | - | N | SAA | SM | Dry |
| 13.0 | - | 24" | 0.0 | N | - | N | SAA | SM | Dry |
| 15.0 | - | 48" | 0.0 | N | - | N | SAA | SM | Dry |
| 19.0 | - | 48" | 0.0 | N | - | N | SAA<br>21.0': Light gray-brown CLAY; firm | SM<br>CL | Dry |
| 23.0 | - | 48" | 0.0 | N | - | N | SAA | CL | Moist |
| 27.0 | - | 24" | 0.0 | N | - | N | SAA | CL | Moist |
| 29.0 | - | 12" | 0.0 | N | - | N | SAA | CL | Moist |
| 30.0 | | | | | | | Boring terminated at 30' bgs<br>Install monitoring well PRMW-1S | | |

# BOREHOLE LOG

BORING ID #: PRMW-2D

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME:** | NYSEG Penn Yan | **PROJECT NO.:** | 60648952 | **CLIENT:** | NYSEG |
| **SITE LOCATION:** | Penn Yan, NY | **BORING LOCATION:** | PRMW-2D | **DRILLING METHOD:** | Hollow Stem Auger, 4' Macrocore |
| **DRILLING CO.:** | Nothnagle | **DRILLER:** | Bryan Swartz | **TOTAL DEPTH DRILLED:** | 35' bgs |
| **BOREHOLE DIAMETER:** | 9" | **DEPTH TO BEDROCK:** | N/A | **WEATHER CONDITIONS:** | 35°F, Overcast |
| **TOTAL DEPTH REACHED:** | 35' bgs | **INSPECTOR:** | Alexandra Golden | **ELEVATION AND DATUM:** | 731.8 ft., NAD83/2011 |
| **NORTHING:** | 969084.6 | **EASTING:** | 693380.3 | **START:** 1/14/2021 | **FINISH:** 1/14/2021 |

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | - | - | | | | |
| FALL | - | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore | HSA | - | - | CME LL 55 |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | - | - | - | N | - | N | Air knife 0.0' - 5.0'<br>0' - 0.5': Topsoil<br>0.5': Brown,fine to medium silty SAND, little fine gravel; compact/very firm | Fill | Dry |
| 5.0 | - | 31" | 0.0 | N | - | N | Same as above (SAA) | Fill | Dry |
| 9.0 | - | 6" | 0.0 | N | - | N | SAA, coarse 3" gravel | Fill | Dry |
| 13.0 | - | 21" | 0.0 | N | - | N | SAA<br>13.2'-13.7': Concrete Dust<br>13.7': Fill, Brown,fine to medium silty SAND, little fine gravel; compact/very firm | Fill | Dry |
| 15.0 | - | 48" | 0.0 | N | - | N | Brown silty SAND, some fine-medium gravel; moist | SM | Moist |
| 19.0 | - | 4" | 0.0 | N | - | N | SAA | SM | Moist |
| 23.0 | - | - | - | - | - | - | No recovery | - | - |
| 25.0 | - | 3" | 0.0 | N | - | N | CLAY soft, wet | CL | Wet |
| 29.0 | - | 48" | 0.0 | N | - | N | Brown homogeneous SAND, some silt, soft | SP | Wet |
| 33.0 | - | 25" | 0.0 | N | - | N | SAA<br>33.25': clayey fine SAND, 1" chert subangular gravel; firm, dry | SP | Wet<br>Moist |
| 35.0 | | | | | | | Boring terminated at 35' bgs<br>Install monitoring well PRMW-2D | | |

# BOREHOLE LOG

BORING ID #: PRMW-2S

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME** | NYSEG Penn Yan | **PROJECT NO.:** | 60648952 | **CLIENT:** | NYSEG |
| **SITE LOCATION:** | Penn Yan, NY | **BORING LOCATION:** | PRMW-2S | **DRILLING METHOD:** | Hollow Stem Auger |
| **DRILLING CO.:** | Nothnagle | **DRILLER:** | Bryan Swartz | **TOTAL DEPTH DRILLED:** | 20' bgs |
| **BOREHOLE DIAMETER:** | 9" | **DEPTH TO BEDROCK:** | N/A | **WEATHER CONDITIONS:** | 35°F, Overcast |
| **TOTAL DEPTH REACHED:** | 20' bgs | **INSPECTOR:** | Alexandra Golden | **ELEVATION AND DATUM:** | 731.5 ft., NAD83/2011 |
| **NORTHING:** | 969080.7 | **EASTING:** | 693383.5 | **START:** 1/14/2021 | **FINISH:** 1/14/2021 |

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | - | - | | | | |
| FALL | - | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore | HSA | - | - | CME LL 55 |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

| FIELD SAMPLE INFORMATION | | | | | | | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | | | |
| - | - | - | - | - | - | - | Advancing boring to 20' without sampling for installation of monitoring well PRMW-2S. See PRMW-2D boring log for Geologic Description.<br>Boring terminated at 20' bgs<br>Install monitoring well PRMW-2S | - | - |

# BOREHOLE LOG

BORING ID #: PRMW-3D

**PROJECT NAME** NYSEG Penn Yan
**SITE LOCATION:** Penn Yan, NY
**DRILLING CO.:** Nothnagle
**BOREHOLE DIAMETER:** 9"
**TOTAL DEPTH REACHED:** 35' bgs
**NORTHING:** 969037.7

**PROJECT NO.:** 60648952
**BORING LOCATION:** PRMW-3D
**DRILLER:** Bryan Swartz
**DEPTH TO BEDROCK:** N/A
**INSPECTOR:** Alexandra Golden
**EASTING:** 693433.2

**CLIENT:** NYSEG
**DRILLING METHOD:** Hollow Stem Auger, 4' Macrocore
**TOTAL DEPTH DRILLED:** 35' bgs
**WEATHER CONDITIONS:** 30°F, Overcast
**ELEVATION AND DATUM:** 721.0 ft., NAD83/2011
**START:** 1/5/2021 **FINISH:** 1/5/2021

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore/ Split Spoon | HSA | - | - | CME LL 55 |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | - | 24" | 0.0 | N | - | N | Brown fine-coarse SAND, coarse gravel (up to 3" diameter); loose, dry | Fill | Dry |
| 4.0 | - | 15" | 0.0 | N | - | N | Same as above (SAA)<br>Switch to 3" Split Spoon | Fill | Dry |
| 6.0 | - | 16" | 0.0 | N | - | N | SAA<br>6.5': Brown silty SAND, some fine-medium gravel; compact, dry | Fill<br>SM | Dry |
| 8.0 | - | 19" | 0.0 | N | - | N | SAA; very compact | SM | Dry<br>Moist |
| 10.0 | - | 24" | 0.0 | N | - | N | SAA; compact, moist | SM | Moist |
| 12.0 | - | 24" | 0.0 | N | - | N | SAA | SM | Moist |
| 14.0 | - | 13" | 0.0 | N | - | N | SAA<br>14.8': Gray CLAY; soft, wet | SM<br>CL | Moist<br>Wet |
| 16.0 | - | 24" | 0.0 | N | - | N | SAA | CL | Wet |
| 18.0 | - | 17" | 0.0 | N | - | N | SAA | CL | Wet |
| 20.0 | - | 0" | - | - | - | - | Sands; No recovery | - | - |

# BOREHOLE LOG

BORING ID #: PRMW-3D CONT.

**PROJECT NAME** NYSEG Penn Yan
**SITE LOCATION:** Penn Yan, NY
**DRILLING CO.:** Nothnagle
**BOREHOLE DIAMETER:** 9"
**TOTAL DEPTH REACHED:** 35' bgs
**NORTHING:** 969037.7

**PROJECT NO.:** 60648952
**BORING LOCATION:** PRMW-3D
**DRILLER:** Bryan Swartz
**DEPTH TO BEDROCK:** N/A
**INSPECTOR:** Alexandra Golden
**EASTING:** 693433.2

**CLIENT:** NYSEG
**DRILLING METHOD:** Hollow Stem Auger, 4' Macrocore
**TOTAL DEPTH DRILLED:** 35' bgs
**WEATHER CONDITIONS:** 30°F, Overcast
**ELEVATION AND DATUM:** 721.0 ft., NAD83/2011
**START:** 1/5/2021 **FINISH:** 1/5/2021

**FIELD SAMPLE INFORMATION**

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore/Split Spoon | HSA | - | - | **CME LL 55** |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 24.0 | - | 6" | 0.0 | N | - | N | Gray CLAY | CL | Wet |
| 28.0 | - | 0" | - | - | - | - | No Recovery | - | - |
| 32.0 | - | 18" | 0.0 | N | - | N | Gray CLAY | CL | Wet<br>Moist |
| 35.0 | | | | | | | Boring terminated at 35.0' bgs<br>Install monitoring well PRMW-3D | | |

# BOREHOLE LOG

BORING ID #: PRMW-3S

**PROJECT NAME:** NYSEG Penn Yan
**SITE LOCATION:** Penn Yan, NY
**DRILLING CO.:** Nothnagle
**BOREHOLE DIAMETER:** 9"
**TOTAL DEPTH REACHED:** 20' bgs
**NORTHING:** 969032.7

**PROJECT NO.:** 60648952
**BORING LOCATION:** PRMW-3S
**DRILLER:** Bryan Swartz
**DEPTH TO BEDROCK:** N/A
**INSPECTOR:** Alexandra Golden
**EASTING:** 693434.5

**CLIENT:** NYSEG
**DRILLING METHOD:** Hollow Stem Auger, 4' Macrocore
**TOTAL DEPTH DRILLED:** 20' bgs
**WEATHER CONDITIONS:** 30°F, Overcast
**ELEVATION AND DATUM:** 720.9 ft., NAD83/2011
**START:** 1/5/2021 **FINISH:** 1/6/2021

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore/ Split Spoon | HSA | - | - | **CME LL 55** |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | - | 10" | 0.0 | N | - | N | Brown fine-coarse SAND, trace organics | Fill | Dry |
| 4.0 | - | 8" | 0.0 | N | - | N | Same as above (SAA)<br>Switch to 3" Split Spoon | Fill | Dry |
| 6.0 | - | - | - | N | - | N | Cobble fragment in tip of sampler; no recovery | - | - |
| 8.0 | - | 24" | 0.0 | N | - | N | Brown SILT, some fine sand, little clay, trace coarse gravel; compact, moist | SM | Moist |
| 10.0 | - | 24" | 0.0 | N | - | N | SAA; compact | SM | Moist |
| 12.0 | - | 19" | 0.0 | N | - | N | SAA | SM | Moist |
| 14.0 | - | 20" | 0.0 | N | - | N | SAA; Last 7": 1"-2" subangular-angular gravel | SM | Wet |
| 16.0 | - | 24" | 0.0 | N | - | N | SAA<br>17.2':Gray CLAY; soft, wet | SM<br>CL | Wet |
| 18.0 | - | 3" | 0.0 | N | - | N | Gray SILT, subangular medium gravel, some sand; poorly sorted, very wet | GM | Wet |
| 20.0 | | | | | | | Boring terminated at 20' bgs<br>Install monitoring well PRMW-3S | | |

# BOREHOLE LOG

BORING ID #: PRMW-4S

**PROJECT NAME** NYSEG Penn Yan
**SITE LOCATION:** Penn Yan, NY
**DRILLING CO.:** Nothnagle
**BOREHOLE DIAMETER:** 9"
**TOTAL DEPTH REACHED:** 24' bgs
**NORTHING:** 968897.4

**PROJECT NO.:** 60648952
**BORING LOCATION:** PRMW-4S
**DRILLER:** Bryan Swartz
**DEPTH TO BEDROCK:** N/A
**INSPECTOR:** Alexandra Golden
**EASTING:** 693373.3

**CLIENT:** NYSEG
**DRILLING METHOD:** Hollow Stem Auger, 4' Macrocore
**TOTAL DEPTH DRILLED:** 24' bgs
**WEATHER CONDITIONS:** 30°F, Overcast
**ELEVATION AND DATUM:** 719.1 ft., NAD83/2011
**START:** 1/13/2021 **FINISH:** 1/13/2021

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | - | - | | | | |
| FALL | - | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore | HSA | - | - | CME LL 55 |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | - | 28" | 0.0 | N | - | N | Brown silty fine-medium SAND, trace organics; dry<br>1.5': Same as above (SAA) with coarse gravel | Fill | Dry |
| 4.0 | - | 13" | 0.0 | N | - | N | SAA (moist last 1") | Fill | Dry<br>Moist |
| 8.0 | - | 3" | 0.0 | N | - | N | Brown medium SAND; becoming wet | Fill | Moist<br>Wet |
| 10.0 | - | 48" | 0.0 | N | - | N | Brown medium-fine sand; loose<br>11.6': Brown medium-fine silty SAND; firm | Fill<br>SM | Wet |
| 14.0 | - | 23" | 0.0 | N | - | N | SAA, silty SAND<br>15.4': Dark brown SILT; firm | SM | Wet |
| 18.0 | - | 0" | - | - | - | - | No recovery | - | - |
| 20.0 | - | 0" | - | - | - | - | No recovery | - | - |
| 24.0 | | | | | | | Boring terminated at 24' bgs<br>Install monitoring well PRMW-4S | | |

# BOREHOLE LOG

BORING ID #: PRMW-5D

**PROJECT NAME** NYSEG Penn Yan
**SITE LOCATION:** Penn Yan, NY
**DRILLING CO.:** Nothnagle
**BOREHOLE DIAMETER:** 9"
**TOTAL DEPTH REACHED:** 30' bgs
**NORTHING:** 968946.6

**PROJECT NO.:** 60648952
**BORING LOCATION:** PRMW-5D
**DRILLER:** Bryan Swartz
**DEPTH TO BEDROCK:** N/A
**INSPECTOR:** Alexandra Golden
**EASTING:** 693464.3

**CLIENT:** NYSEG
**DRILLING METHOD:** Hollow Stem Auger, 3" split spoon
**TOTAL DEPTH DRILLED:** 30' bgs
**WEATHER CONDITIONS:** 30°F, Overcast
**ELEVATION AND DATUM:** 718.0 ft., NAD83/2011
**START:** 1/12/2021 **FINISH:** 1/12/2021

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Split Spoon | HSA | - | - | CME LL 55 |
| ID/OD | - | 3"/2" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | - | 16" | 0.0 | N | WOH<br>8<br>18<br>22 | N | Brown medium SAND, angular gravel (1"-3"), trace organics; poorly sorted, loose, dry | Fill | Dry |
| 2.0 | - | 16" | 0.0 | N | 19<br>11<br>9<br>9 | N | Same as above (SAA) | Fill | Dry |
| 4.0 | - | 13" | 0.0 | N | 6<br>16<br>13<br>13 | N | SAA<br>4.6':Brown silty fine SAND, some gravel, little clay, trace organics; moist, compact | Fill | Dry<br>Moist |
| 6.0 | - | 7" | 0.0 | N | 14<br>19<br>16<br>14 | N | SAA, with coarse gravel | Fill | Moist |
| 8.0 | - | 8" | 0.0 | N | 4<br>4<br>6<br>6 | N | SAA, loose, fine subrounded gravel throughout (0.25") | Fill | Wet |
| 10.0 | - | 12" | 0.0 | N | 1<br>2<br>2<br>1 | N | Switch to 2" split spoon for remainder of boring<br>SAA | Fill | Wet |
| 12.0 | - | 6" | 0.0 | N | 5<br>6<br>7<br>6 | N | SAA | Fill | Wet |
| 14.0 | - | 7" | 0.0 | N | 7<br>2<br>3<br>3 | N | SAA<br>14.3': Gray CLAY; soft, wet | Fill<br>CL | Wet |
| 16.0 | - | 24" | 0.0 | N | 2<br>2<br>2<br>7 | N | Gray CLAY; soft, wet | CL | Wet |
| 18.0 | - | 14" | 0.0 | N | 2<br>3<br>2<br>4 | N | SAA | CL | Wet |

AECOM

# BOREHOLE LOG

BORING ID #: PRMW-5D CONT.

**PROJECT NAME** NYSEG Penn Yan
**SITE LOCATION:** Penn Yan, NY
**DRILLING CO.:** Nothnagle
**BOREHOLE DIAMETER:** 9"
**TOTAL DEPTH REACHED:** 30' bgs
**NORTHING:** 968946.6

**PROJECT NO.:** 60648952
**BORING LOCATION:** PRMW-5D
**DRILLER:** Bryan Swartz
**DEPTH TO BEDROCK:** N/A
**INSPECTOR:** Alexandra Golden
**EASTING:** 693464.3

**CLIENT:** NYSEG
**DRILLING METHOD:** Hollow Stem Auger, 3" split spoon
**TOTAL DEPTH DRILLED:** 30' bgs
**WEATHER CONDITIONS:** 30°F, Overcast
**ELEVATION AND DATUM:** 718.0 ft., NAD83/2011
**START:** 1/12/2021 **FINISH:** 1/12/2021

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Split Spoon | HSA | - | - | CME LL 55 |
| ID/OD | - | 3"/2" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 20.0 | - | 13" | 0.0 | N | 4<br>4<br>6<br>9 | N | SAA | CL | Wet |
| 22.0 | - | 23" | 0.0 | N | 5<br>9<br>10<br>13 | N | SAA, very firm | CL | Wet |
| 24.0 | - | 22" | 0.0 | N | 6<br>12<br>15<br>9 | N | SAA<br>25.0': Brown fine SAND; loose, wet | CL<br>SP | Wet |
| 26.0 | - | 24" | 0.0 | N | 6<br>6<br>6<br>6 | N | SAA | SP | Wet |
| 28.0 | - | 6" | 0.0 | N | 1<br>2<br>1<br>1 | N | SAA, running sands | SP | Wet |
| 30.0 | | | | | | | Boring terminated at 30' bgs<br>Install monitoring well PRMW-5D | | |

# BOREHOLE LOG

BORING ID #: PRMW-5S

START DATE: 1/12/21 END DATE: 1/12/21

| | | |
|---|---|---|
| **PROJECT NAME** NYSEG Penn Yan | **PROJECT NO.:** 60648952 | **CLIENT:** NYSEG |
| **SITE LOCATION:** Penn Yan, NY | **BORING LOCATION:** PRMW-5S | **DRILLING METHOD:** Hollow Stem Auger |
| **DRILLING CO.:** Nothnagle | **DRILLER:** Bryan Swartz | **TOTAL DEPTH DRILLED:** 20' bgs |
| **BOREHOLE DIAMETER:** 9" | **DEPTH TO BEDROCK:** N/A | **WEATHER CONDITIONS:** 30°F, Overcast |
| **TOTAL DEPTH REACHED:** 20' bgs | **INSPECTOR:** Alexandra Golden | **ELEVATION AND DATUM:** 718.1 ft., NAD83/2011 |
| **NORTHING:** 968943.5 | **EASTING:** 693460.2 | **START:** 1/12/2021 **FINISH:** 1/12/2021 |

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Split Spoon | HSA | - | - | CME LL 55 |
| ID/OD | - | 3"/2" | 4.25"/9" | - | - | |

| FIELD SAMPLE INFORMATION | | | | | | | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | | | |
| - | - | - | - | - | - | - | Advancing boring to 20' without sampling for installation of monitoring well PRMW-5S. See PRMW-5D boring log for Geologic Description.<br>Boring terminated at 20.0' bgs<br>Install monitoring well PRMW-5S | - | - |

AECOM

# BOREHOLE LOG

BORING ID #: PRMW-6D

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME:** | NYSEG Penn Yan | **PROJECT NO.:** | 60648952 | **CLIENT:** | NYSEG |
| **SITE LOCATION:** | Penn Yan, NY | **BORING LOCATION:** | MW-6D | **DRILLING METHOD:** | Hollow Stem Auger, 3" split spoon |
| **DRILLING CO.:** | Nothnagle | **DRILLER:** | Bryan Swartz | **TOTAL DEPTH DRILLED:** | 34' bgs |
| **BOREHOLE DIAMETER:** | 9" | **DEPTH TO BEDROCK:** | N/A | **WEATHER CONDITIONS:** | 30°F, Overcast |
| **TOTAL DEPTH REACHED:** | 34' bgs | **INSPECTOR:** | Alexandra Golden | **ELEVATION AND DATUM:** | 718.5 ft., NAD83/2011 |
| **NORTHING:** | 968997.6 | **EASTING:** | 693516.1 | **START:** 1/11/2021 | **FINISH:** 1/11/2021 |

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Split Spoon | HAS | - | - | CME LL 55 |
| ID/OD | - | 3"/2" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | - | 14" | 0.0 | N | WOH<br>4<br>8<br>10 | N | Topsoil, trace organics<br>0.6':Brown coarse angular gravel (1"-3"), medium-fine silty sand | Fill | Dry |
| 2.0 | - | 16" | 0.0 | N | WOH<br>2<br>4<br>8 | N | Same as above (SAA)<br>2.5': Gray medium-coarse SAND, some subangular fine-medium gravel hroughout; dry | Fill | Dry |
| 4.0 | - | 16" | 0.0 | N | 2<br>4<br>8<br>11 | N | Brown silty SAND, trace gravel; compact, soft<br>4.8': Gray silty SAND; medium coarse, stiff | Fill | Dry |
| 6.0 | - | 24" | 0.0 | N | 4<br>12<br>14<br>18 | N | Brown-gray silty SAND; loose, fine grained<br>6.1': SAA, gravel; firm, moist | Fill | Wet<br>Moist |
| 8.0 | - | 0" | - | - | 2<br>2<br>4<br>6 | - | Switch to 2" split spoon for remainder of boring<br>No recovery | Fill | - |
| 10.0 | - | 0" | - | - | 4<br>4<br>4<br>6 | - | No recovery | Fill | - |
| 12.0 | - | 10" | 0.0 | N | 4<br>8<br>12<br>12 | N | Light gray CLAY; moist, compact | CL | Moist |
| 14.0 | - | 21" | 0.0 | N | 2<br>2<br>2<br>4 | N | Gray silty SAND<br>14.1': Light gray CLAY; moist, compact | SM<br>CL | Moist |
| 16.0 | - | 16" | 0.0 | N | 4<br>8<br>10<br>3 | N | SAA | CL | Wet |
| 18.0 | - | 20" | 0.0 | N | WOH<br>4<br>4<br>5 | N | SAA | CL | Wet |

# BOREHOLE LOG

BORING ID #: PRMW-6D CONT.

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME:** | NYSEG Penn Yan | **PROJECT NO.:** | 60648952 | **CLIENT:** | NYSEG |
| **SITE LOCATION:** | Penn Yan, NY | **BORING LOCATION:** | PRMW-6D | **DRILLING METHOD:** | Hollow Stem Auger, 3" split spoon |
| **DRILLING CO.:** | Nothnagle | **DRILLER:** | Bryan Swartz | **TOTAL DEPTH DRILLED:** | 34' bgs |
| **BOREHOLE DIAMETER:** | 9" | **DEPTH TO BEDROCK:** | N/A | **WEATHER CONDITIONS:** | 30°F, Overcast |
| **TOTAL DEPTH REACHED:** | 34' bgs | **INSPECTOR:** | Alexandra Golden | **ELEVATION AND DATUM:** | 718.5 ft., NAD83/2011 |
| **NORTHING:** | 968997.6 | **EASTING:** | 693516.1 | **START:** 1/11/2021 | **FINISH:** 1/11/2021 |

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | 140 lbs | - | | | | |
| FALL | 30" | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Split Spoon | HSA | - | - | **CME LL 55** |
| ID/OD | - | 3"/2" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 20.0 | - | 0" | - | - | WOH<br>4<br>6<br>6 | - | No Recovery | - | - |
| 22.0 | - | 11" | 0.0 | N | WOH<br>5<br>5<br>6 | N | Light gray SILT, some fine sand, fine subangular gravel (0.25") | SM | Wet |
| 24.0 | - | 15" | 0.0 | N | 4<br>4<br>4<br>6 | N | Gray SILT, some fine sand, little fine-medium gravel; compact, moist | SM | Wet |
| 26.0 | - | 10" | 0.0 | N | 13<br>14<br>17<br>24 | N | SAA | SM | Wet |
| 28.0 | - | 12" | 0.0 | N | 4<br>6<br>8<br>5 | N | Brown fine SAND, some silt, loose, wet, homogeneous | SP | Wet |
| 30.0 | - | 9.5" | 0.0 | N | 4<br>5<br>8<br>9 | N | SAA | SP | Wet |
| 32.0 | - | 24" | 0.0 | N | 5<br>10<br>14<br>12 | N | SAA | SP | Wet |
| 34.0 | | | | | | | Boring terminated at 34' bgs<br>Install monitoring well PRMW-6D | | |

# BOREHOLE LOG

BORING ID #: PRMW-6S

**PROJECT NAME** NYSEG Penn Yan
**SITE LOCATION:** Penn Yan, NY
**DRILLING CO.:** Nothnagle
**BOREHOLE DIAMETER:** 9"
**TOTAL DEPTH REACHED:** 20' bgs
**NORTHING:** 968993.9

**PROJECT NO.:** 60648952
**BORING LOCATION:** PRMW-6S
**DRILLER:** Bryan Swartz
**DEPTH TO BEDROCK:** N/A
**INSPECTOR:** Alexandra Golden
**EASTING:** 693519.0

**CLIENT:** NYSEG
**DRILLING METHOD:** Hollow Stem Auger, 4' Macrocore
**TOTAL DEPTH DRILLED:** 20' bgs
**WEATHER CONDITIONS:** 30°F, Overcast
**ELEVATION AND DATUM:** 717.9 ft, NAD83/2011
**START:** 1/8/2021 **FINISH:** 1/8/2021

| | HAMMER | SAMPLER | | | | |
|---|---|---|---|---|---|---|
| WEIGHT(S) | - | - | | | | |
| FALL | - | - | CASING | TUBE | CORE | RIG TYPE: |
| TYPE | - | Macrocore | HSA | - | - | CME LL 55 |
| ID/OD | - | 3" | 4.25"/9" | - | - | |

| DEPTH (feet bgs) | SAMPLE ID | RECOVERY | PID (ppm) | ODOR OBSERVED | BLOW COUNTS | VISIBLE PRODUCT | GEOLOGIC DESCRIPTION | USCS DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | | 16" | 0.0 | N | - | N | Topsoil, trace organics<br>0.5': Brown fine-medium SAND, fine-coarse angular gravel; poorly sorted, loose, dry | Fill | Dry |
| 4.0 | | 0" | - | - | - | - | No Recovery | - | - |
| 8.0 | | 48" | 0.0 | N | - | N | Gray CLAY; compact, moist<br>11.2':Dark gray CLAY, little subrounded gravel; compact | CL | Moist |
| 12.0 | | 21" | 0.0 | N | - | N | Same as above (SAA)<br>13': Coarse subangular GRAVEL (1"- 2") | CL | Moist<br>Wet |
| 14.0 | | 30" | 0.0 | N | - | N | SAA, little subrounded gravel | CL | Wet |
| 18.0 | | 21" | 0.0 | N | - | N | SAA, light gray | CL | Wet |
| 20.00 | | | | | | | Boring terminated at 20' bgs<br>Install monitoring well PRMW-6S | | |

## DRILLING SUMMARY

**Geologist:**
Alexandra Golden

**Drilling Company:**
Nothnagle Drilling

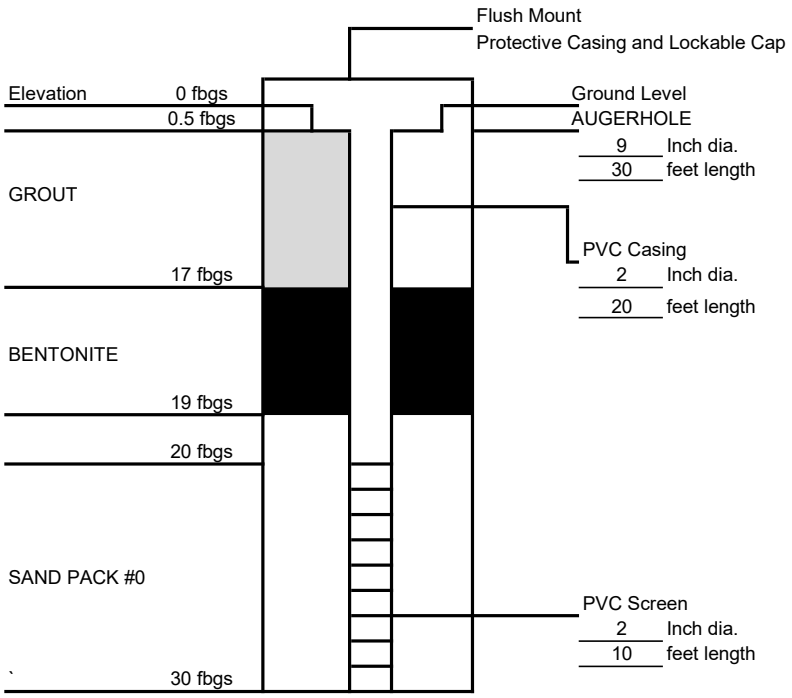
**Driller:**
Bryan Swartz

**Rig Make/Model:**
CME LL 55- Hollow Stem Auger

**Date:**
1/13/2021

### GEOLOGIC LOG

| Depth (fbgs): | Description: |
|---|---|
| 0 - 20 | SM |
| 20 - 30 | CL |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Flush mount with well box | **TYPE:** 2" PVC | **TYPE:** #0 SAND **SETTING:** 30 - 19 fbgs |
| **MONITOR:** 2" PVC | **SLOT SIZE:** 0.02 | **SEAL MATERIAL** **TYPE:** Bentonite, 3/8" hole plug **SETTING:** 19 - 17 fbgs |

**COMMENTS:**

0.5 - 17 fbgs = Grout

17 - 19 fbgs = Bentonite seal, time released pellet

19 - 30 fbgs = Sand Pack

**LEGEND**

- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

**Client:** NYSEG

**Location:** Penn Yan, NY

**Project Number:** 60648952

AECOM

**MONITORING WELL CONSTRUCTION DETAILS**

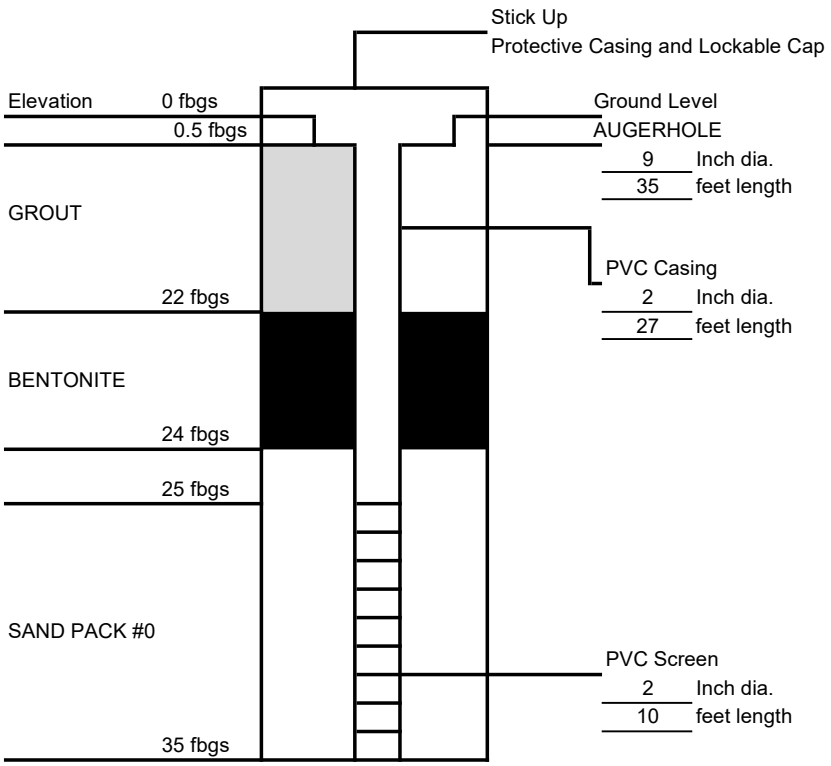
**Well ID:**

**PRMW-1S**

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/14/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 6.3 | Fill |
| 6.3 - 23 | SM |
| 23 - 29 | CL |
| 29 - 35 | SP |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing | **TYPE:** 2" PVC | **TYPE:** #0 SAND **SETTING:** 35 - 24 fbgs |
| **MONITOR:** 2" PVC | **SLOT SIZE:** 0.02 | **SEAL MATERIAL** **TYPE:** Bentonite, 3/8" hole plug **SETTING:** 24 - 22 fbgs |

**COMMENTS:**

0.5 - 22 fbgs = Grout

22 - 24 fbgs = Bentonite seal, time released pellet

24 - 35 fbgs = Sand Pack

**LEGEND**

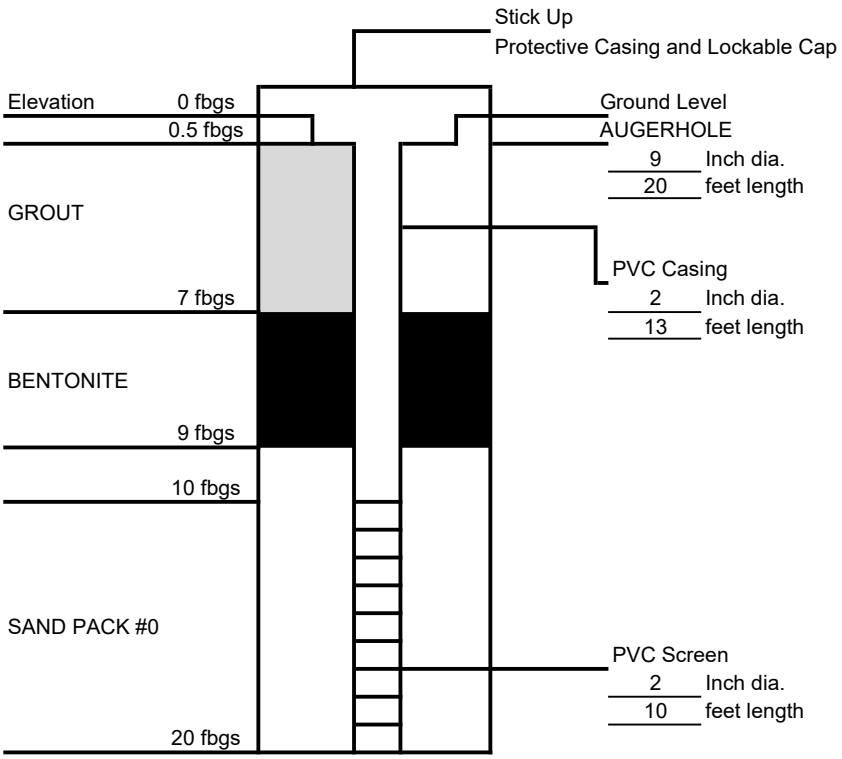
- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-2D** |

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/14/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 6.3 | Fill |
| 6.3 - 20 | SM |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing | **TYPE:** 2" PVC | **TYPE:** #0 SAND **SETTING:** 20 - 9 fbgs |
| **MONITOR:** 2" PVC | **SLOT SIZE:** 0.02 | **SEAL MATERIAL** **TYPE:** Bentonite, 3/8" hole plug **SETTING:** 9 - 7 fbgs |

**COMMENTS:**

0.5 - 7 fbgs = Grout

7 - 9 fbgs = Bentonite seal, time released pellet

9 - 20 fbgs = Sand Pack

**LEGEND**

- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-2S** |

## DRILLING SUMMARY

**Geologist:**
Alexandra Golden

**Drilling Company:**
Nothnagle Drilling

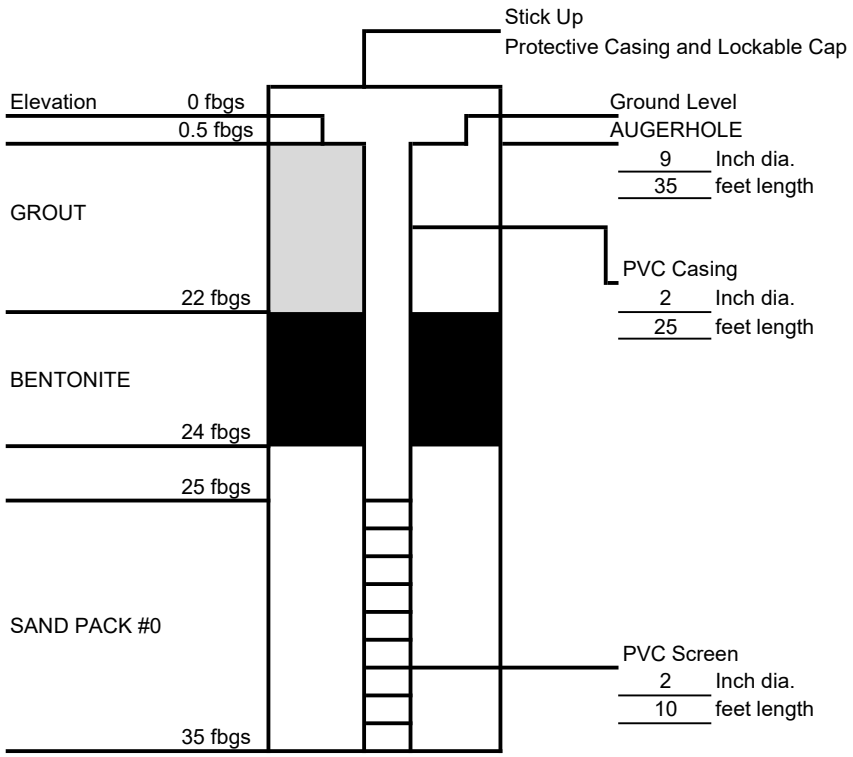
**Driller:**
Bryan Swartz

**Rig Make/Model:**
CME LL 55- Hollow Stem Auger

**Date:**
1/5/2021

## GEOLOGIC LOG

| Depth (fbgs): | Description: |
|---|---|
| 0 - 6 | Fill |
| 6 - 15 | SM |
| 15 - 35 | CL |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing<br>**MONITOR:** 2" PVC | **TYPE:** 2" PVC<br>**SLOT SIZE:** 0.02 | **TYPE:** #0 SAND **SETTING:** 35 - 24 fbgs<br>**SEAL MATERIAL**<br>**TYPE:** Bentonite, 3/8" hole plug<br>**SETTING:** 24 - 22 fbgs |

**COMMENTS:** Gauged water level - 7.50'

0.5 - 22 fbgs = Grout

22 - 24 fbgs = Bentonite seal, time released pellet

24 - 35 fbgs = Sand Pack

**LEGEND**

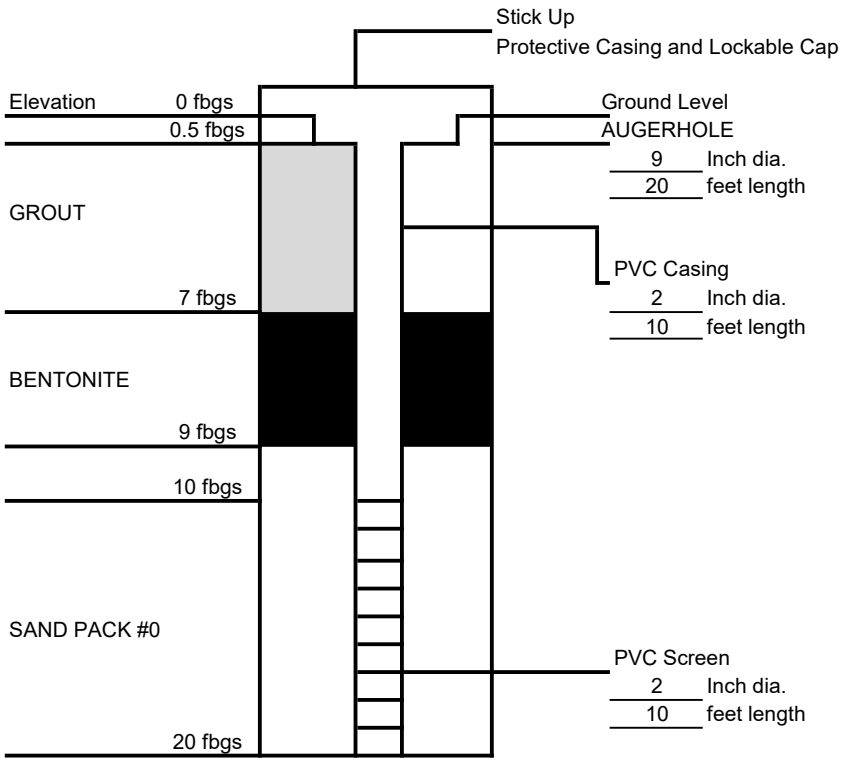
- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-3D** |

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/6/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 8 | Fill |
| 8 - 17.2 | SM |
| 17.2 - 18 | CL |
| 18 - 20 | GM |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing | **TYPE:** 2" PVC | **TYPE:** #0 SAND **SETTING:** 20 - 9 fbgs |
| **MONITOR:** 2" PVC | **SLOT SIZE:** 0.02 | **SEAL MATERIAL** **TYPE:** Bentonite, 3/8" hole plug **SETTING:** 9 - 7 fbgs |

**COMMENTS:** Gauged water level - 9.29'

0.5 - 7 fbgs = Grout

7 - 9 fbgs = Bentonite seal, time released pellet

9 - 20 fbgs = Sand Pack

**LEGEND**

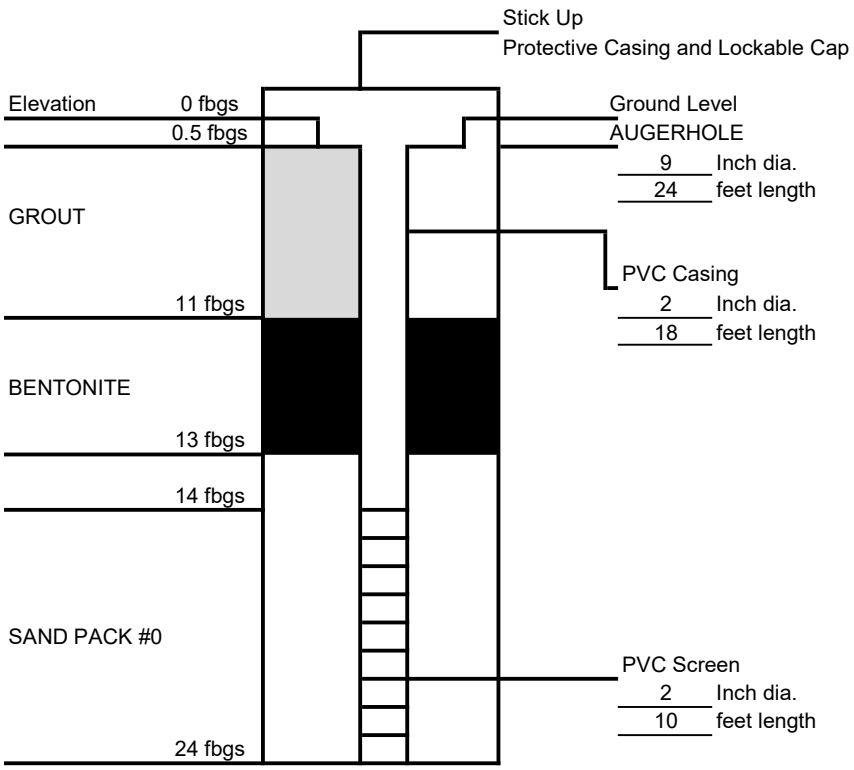
- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-3S** |

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/13/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 8 | Fill |
| 8-10 | SP |
| 8 - 18 | SM |
| 18 - 24 | No Recovery |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing<br>**MONITOR:** 2" PVC | **TYPE:** 2" PVC<br>**SLOT SIZE:** 0.02 | **TYPE:** #0 SAND **SETTING:** 24 - 13 fbgs<br>**SEAL MATERIAL**<br>**TYPE:** Bentonite, 3/8" hole plug<br>**SETTING:** 13 - 11 fbgs |

**COMMENTS:**

0.5 - 11 fbgs = Grout

11 - 13 fbgs =Bentonite seal, time released pellet

13 - 24 fbgs = Sand Pack

**LEGEND**

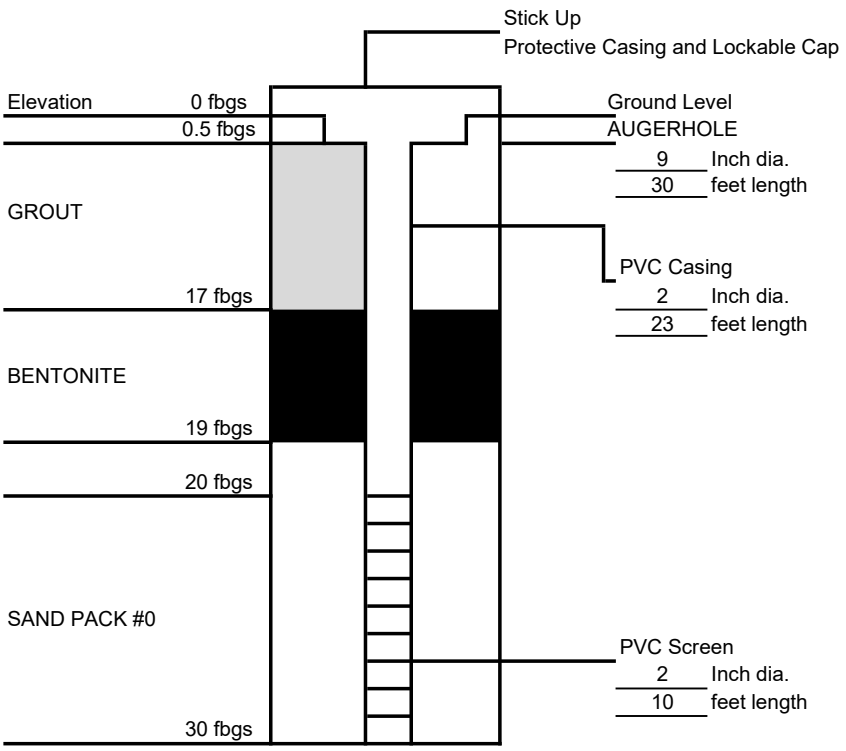
- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-4S** |

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/12/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 4.6 | Fill |
| 4.6 - 14.25 | SM |
| 14.25 - 25 | CL |
| 25 - 30 | SP |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing | **TYPE:** 2" PVC | **TYPE:** #0 SAND **SETTING:** 30 - 19 fbgs |
| **MONITOR:** 2" PVC | **SLOT SIZE:** 0.02 | **SEAL MATERIAL** **TYPE:** Bentonite, 3/8" hole plug **SETTING:** 19 - 17 fbgs |

**COMMENTS:** Gauged water level - 5.00'

0.5 - 17 fbgs = Grout

17 - 19 fbgs = Bentonite seal, time released pellet

19 - 30 fbgs = Sand Pack

**LEGEND**

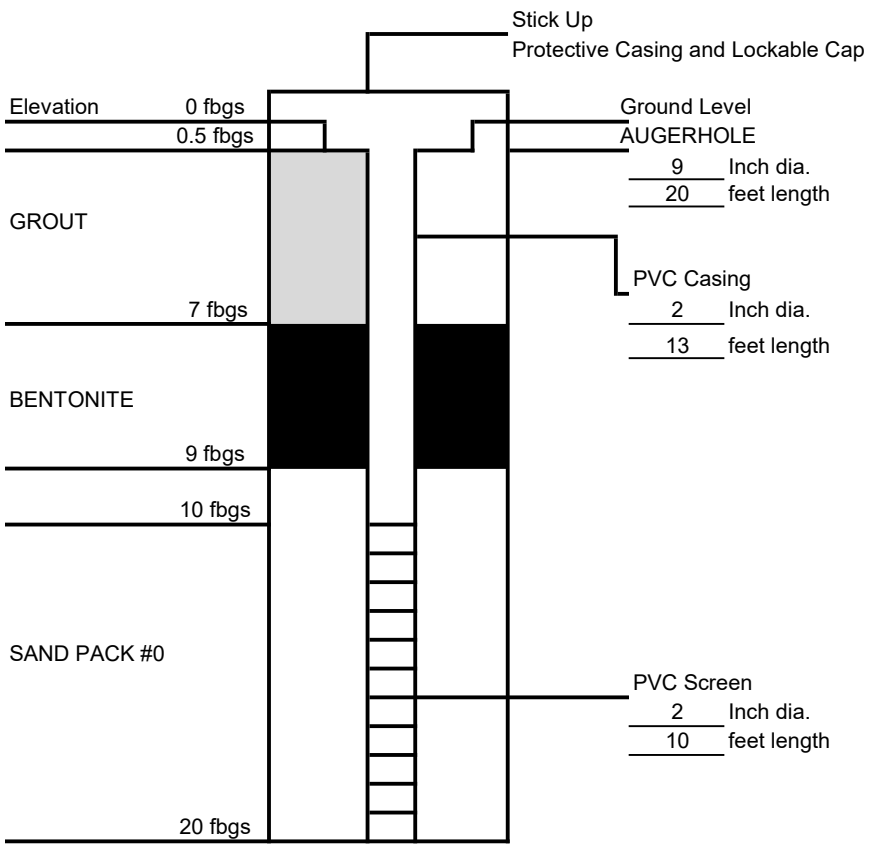
- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-5D** |

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/12/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 4.6 | Fill |
| 4.6 - 14.25 | SM |
| 14.25 - 20 | CL |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing<br>**MONITOR:** 2" PVC | **TYPE:** 2" PVC<br>**SLOT SIZE:** 0.02 | **TYPE:** #0 SAND **SETTING:** 20 - 9 fbgs<br>**SEAL MATERIAL**<br>**TYPE:** Bentonite, 3/8" hole plug<br>**SETTING:** 9 - 7 fbgs |

**COMMENTS:** Gauged water level - 7.69'

0.5 - 7 fbgs = Grout

7 - 9 fbgs = Bentonite seal, time released pellet

9 - 20 fbgs = Sand Pack

**LEGEND**

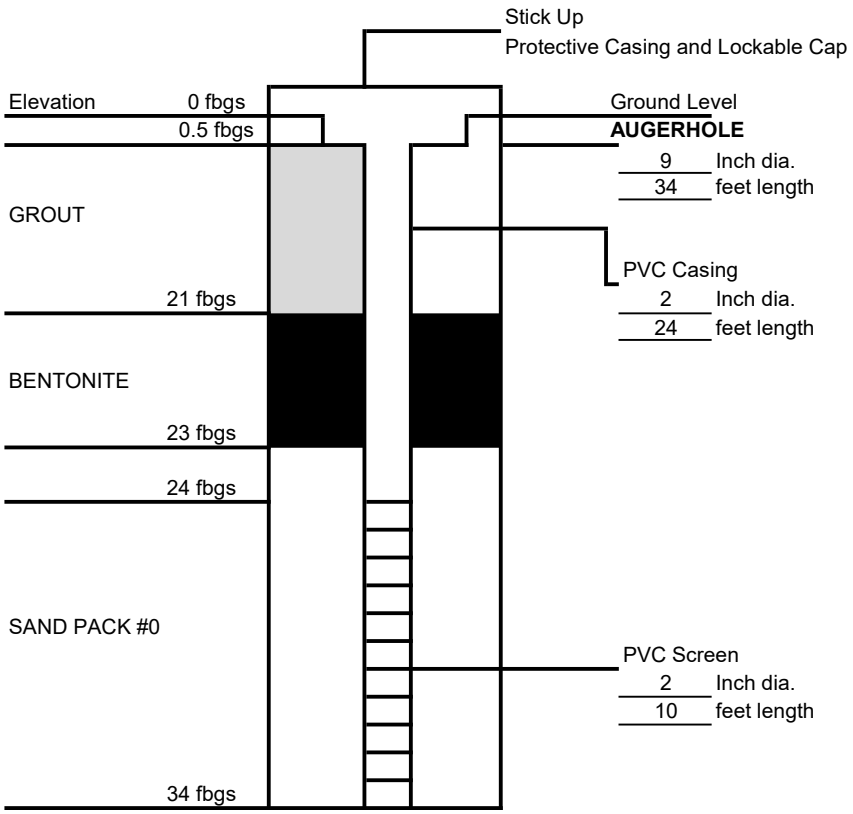
- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-5S** |

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/11/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 4 | Fill |
| 4 - 12 | SM |
| 12 - 22 | CL |
| 22 - 28 | SM |
| 28 - 34 | SP |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing | **TYPE:** 2" PVC | **TYPE:** #0 SAND **SETTING:** 34 - 23 fbgs |
| **MONITOR:** 2" PVC | **SLOT SIZE:** 0.02 | **SEAL MATERIAL** **TYPE:** Bentonite, 3/8" hole plug **SETTING:** 23 - 21 fbgs |

**COMMENTS:** Gauged water level - 4.71'

0.5 - 21 fbgs = Grout

23 - 21 fbgs = Bentonite seal, time released pellet

23 - 34 fbgs = Sand Pack

**LEGEND**

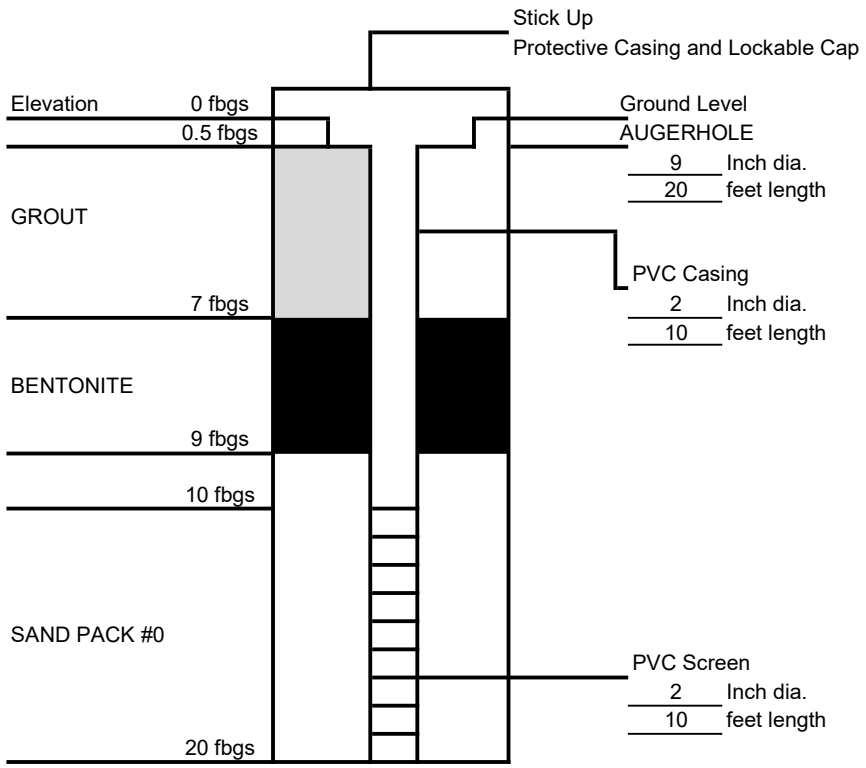
- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-6D** |

| DRILLING SUMMARY |
|---|
| **Geologist:** |
| Alexandra Golden |
| **Drilling Company:** |
| Nothnagle Drilling |
| **Driller:** |
| Bryan Swartz |
| **Rig Make/Model:** |
| CME LL 55- Hollow Stem Auger |
| **Date:** |
| 1/8/2021 |

**GEOLOGIC LOG**

| Depth (fbgs): | Description: |
|---|---|
| 0 - 4 | Fill |
| 8 - 20 | CL |




## WELL DESIGN

| CASING MATERIAL | SCREEN MATERIAL | FILTER MATERIAL |
|---|---|---|
| **SURFACE:** Stick up above grade, 4" Steel casing | **TYPE:** 2" PVC | **TYPE:** #0 SAND **SETTING:** 20 - 9 fbgs |
| **MONITOR:** 2" PVC | **SLOT SIZE:** 0.02 | **SEAL MATERIAL** **TYPE:** Bentonite, 3/8" hole plug **SETTING:** 9 - 7 fbgs |

**COMMENTS:** Gauged water level - 6.55'

0.5 - 7 fbgs = Grout

7 - 9 fbgs = Bentonite seal, time released pellet

9 - 20 fbgs = Sand Pack

**LEGEND**

- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

| | | |
|---|---|---|
| **Client:** NYSEG | **Location:** Penn Yan, NY | **Project Number:** 60648952 |
| AECOM | **MONITORING WELL CONSTRUCTION DETAILS** | **Well ID:** **PRMW-6S** |

# APPENDIX D – EXCAVATION WORK PLAN (EWP)

## D-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination or breach or alter the Site's cover system, the Site owner or their representative will notify the NYSDEC contacts list in the table below. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix B.

**Table 1: Notifications***

| | |
|---|---|
| Thomas Haley<br>Region 8 NYSDEC Representative | 585-226-5400<br>thomas.haley@dec.ny.gov |
| Gerald Pratt<br>NYSDEC Project Manager | 518-402-9667<br>gerald.pratt@dec.ny.gov |
| John Ruspantini<br>NYSEG Project Manager | 607-725-3801<br>jjruspantini@nyseg.com |

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for Site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated, any modifications of truck routes, and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;

- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP, 29 CFR 1910.120 and 29 CFR 1926 Subpart P;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix E of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with the required request to import form and all supporting documentation including, but not limited to chemical testing results.

The NYSDEC project manager will review the notification and may impose additional requirements for the excavation that are not listed in this EWP.

## D-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed during all excavations into known or potentially contaminated material (remaining contamination) or a breach of the cover system. A qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will perform the screening. Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Since the source material was removed from the gas plant Site during various remedial actions and interim remedial measures (IRMs) and disposed off-site, only soils beyond the limits of excavation may exhibit contaminants of concern (COCs) above the Site Cleanup Goals (SCGs) and would require management as per methods described in this method. Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can

be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section D-7 of this Appendix.

## D-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by the NYSDEC.

## D-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site. A Site utility stakeout will be completed for all utilities prior to any ground intrusive activities at the Site.

All soil waste will be trucked off-site or drummed and transported off-site in the drums to a treatment or disposal facility permitted to accept such material. Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials. Material accumulated from the street cleaning and egress cleaning activities will be disposed off-site at a permitted landfill facility in accordance with all applicable local, State, and Federal regulations.

## D-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes are as follows (all roads are identified on the map provided as Figure 1):

1. Local Truck Route:
    a. Traveling on NY-20W
    b. Turn left onto NY-14A S/NY-245 S
    c. Turn left onto Water Street
    d. Turn right off Water Street to enter Site
2. Alternate Local Truck Route:
    a. Traveling on NY-20W
    b. Turn left onto Pre Emption Road
    c. Turn right onto NY-54 W
    d. Turn left onto Main Street
    e. Turn right onto Water Street
    f. Turn left off Water Street to enter Site
3. Truck Route from I-90 W:
    a. Traveling on I-90 W
    b. Take exit 42 toward NY-14/Geneva Lyons/Lyons
    c. Merge onto NY-318
    d. Turn right onto NY-14S
    e. Take the New York 96 N ramp
    f. Turn left onto Pre Emption Road
    g. Follow directions from alternate local route from c

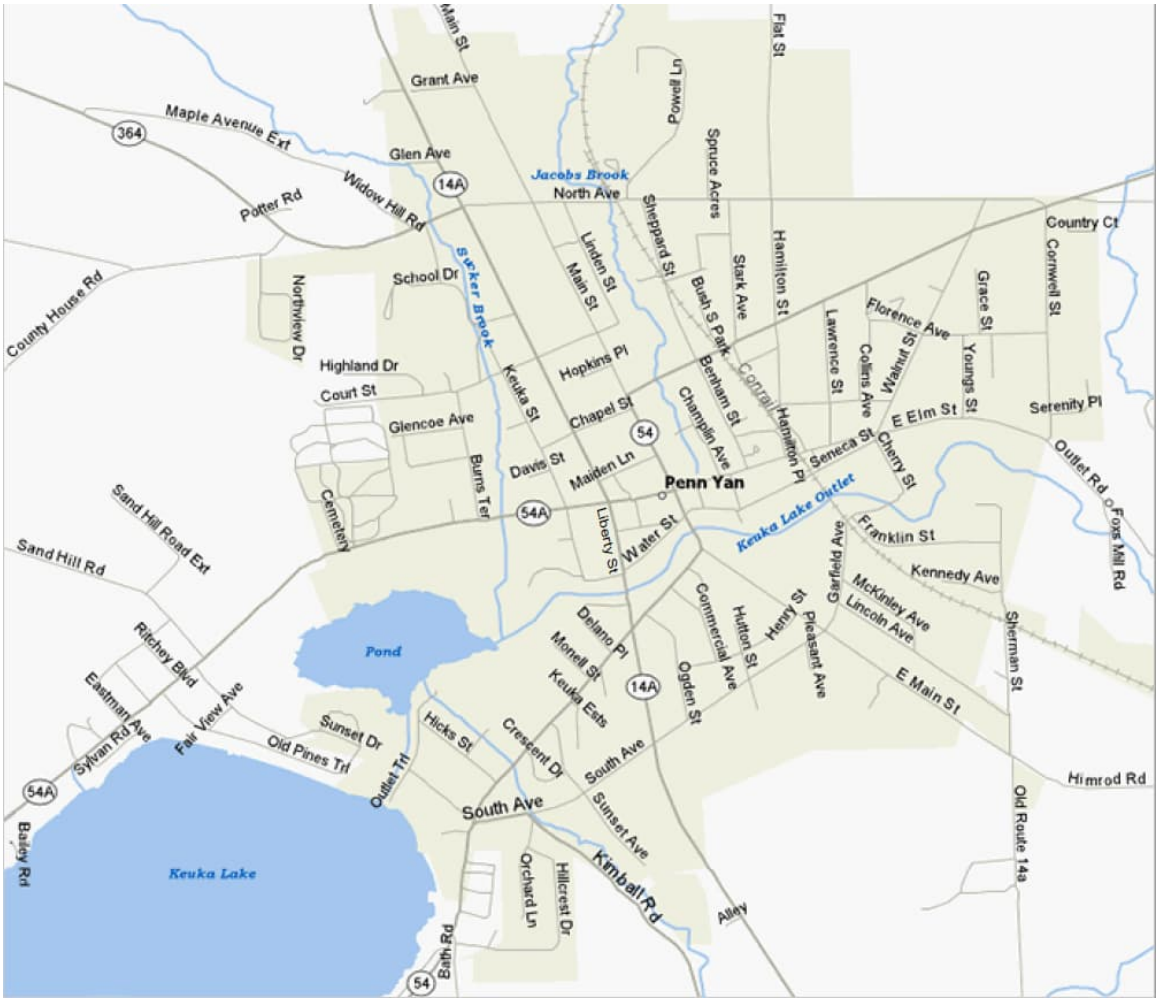



*Figure 1: Route Map*

All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

## D-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed off-site in a permitted facility in accordance with all local, State and Federal regulations. If disposal of material from this Site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC project manager. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC project manager approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, (e.g. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C&D debris recovery facility. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report.

This documentation will include, but will not be limited to: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled consistent with 6 NYCRR Parts 360, 361, 362, 363, 364 and 365. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State C&D debris recovery facility (6 NYCRR Subpart 360-15 registered or permitted facility).

## D-7 MATERIALS REUSE ON-SITE

Any excavated materials that are potentially reusable on-site (that do not contain visible tar) must be sampled and proven suitable prior to use. Excavated material must be stockpiled and secured on-site in accordance with the materials management practices stated above prior to sampling. Stockpiles shall be limited to a maximum size of 500 cubic yards for sampling. A three-point composite sample will be collected from each stockpile and submitted for analytical as described below. This section is applicable only for the areas where potential contaminated soils may be left in place. The excavation and reuse of material in the areas already remediated do not have to be managed per these requirements.

The qualified environmental professional as defined in 6 NYCRR part 375 will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material (i.e. contaminated) does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the Site use criteria

presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances [June 2021 or date of current version, whichever is later] guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Sections D-2 and D-3 of this EWP. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of Site excavation activities and proximity to nearby site features. Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-site.

## D-8 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed off-site at a permitted facility in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the Site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

## D-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Site Management Plan or Record of Decision. The existing cover system is comprised of a minimum of 24 inches of clean soil; or a 6-inch geoweb infilled with a 1 inch layer of AquaGate overlain by 5 inches of AquaBlok all overlain by a geotextile demarcation layer and a minimum of 12 inches of clean soil. The demarcation layer, consisting of 8-ounce non-woven geotextile will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

## D-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the Site will be approved by the qualified environmental professional, as defined in 6 NYCRR Part 375, and will be in compliance with provisions in this SMP prior to receipt at the Site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review. A copy of the form is presented in Appendix J.

Material from industrial sites, spill sites, other environmental remediation sites, or potentially contaminated sites will not be imported to the Site.

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) and DER-10 Appendix 5 for restricted residential. Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table 6NYCRR 375-6.7(d). Soils

that meet ‘general’ fill requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the site without prior approval by NYSDEC project manager. Soil material will be sampled for the full suite of analytical parameters, including PFAS and 1, 4-dioxane. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

## D-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

## D-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition. The NYSDEC project manager will be promptly notified of the discovery.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes [TAL metals; TCL volatiles and semi-volatiles (including 1,4-dioxane), TCL pesticides and PCBs, and PFAS], unless the site history and previous sampling results provide sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC project manager for approval prior to sampling. Any tanks will be closed as per NYSDEC regulations and guidance.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone within two hours to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

## D-13 COMMUNITY AIR MONITORING PLAN

A figure showing the location of air sampling stations based on generally prevailing wind conditions will be developed prior to intrusive activities in areas with potential remaining impacts. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

**D-13A: Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures**

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 part-per-million, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 micrograms per cubic meter, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 micrograms per cubic meter or less at the monitoring point.

Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

## D-13B: Special Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

## D-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include covering the stockpiles and excavation areas with tarp, BioSolve®, or odor control foam. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

## D-15 DUST CONTROL PLAN

Particulate monitoring must be conducted according to the Community Air Monitoring Plan (CAMP) provided in Section D-13. If particulate levels at the Site exceed the thresholds listed in the CAMP or if airborne dust is observed on the Site or leaving the Site, the dust suppression techniques listed below will be employed. The remedial party will also take measures listed below to prevent dust production on the Site.

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved using a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

## D-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

# APPENDIX E – HEALTH AND SAFETY PLAN

**Disclaimer: This is an example HASP only. Any contractors are ultimately responsible for creating their own Site-specific HASP.**

# Universal Health and Safety Plan

**For use on all high-risk, industrial and HAZWOPER projects**
Includes control measures for the Coronavirus Pandemic



## NYSEG Penn Yan Former MGP Site

Water Street
Penn Yan, NY 14527
United States

**Project Number 60648952/60673533**

Project Name Penn Yan Water Street Former MGP

| Prepared for | Prepared by |
|---|---|
| **NYSEG**<br>18 Link Drive<br>Binghamton, New York 13904<br>United States | AECOM<br>40 British American Blvd<br>Latham, New York 12110<br>United States |

| | | |
|---|---|---|
| Prepared By:<br>Abby Chin<br>Civil Engineer | Signature | 01/27/22<br>Date Prepared |
| Reviewed By:<br>Dale "Pete" Wray, CSP, CHMM<br>NE SH&E Manager | Signature | 01/27/22<br>Date Reviewed |
| Approved By:<br>Tamara Raby<br>Project Manager | Signature | 01/27/22<br>Date Approved |

| | |
|---|---|
| Expiration: 02/28/22 | Valid for one (1) year maximum or until the scope of work, subcontractor(s), methods and/or equipment change. |

# HASP SUMMARY

Note: This Summary is intended to provide key information only and cannot be substituted for reading, understanding, and complying with the full HASP, including the Emergency response section. This summary may be continually updated as tasks and personnel change. Use Continuation Sheets if necessary.

| | | | |
|---|---|---|---|
| **Project Name:** | Penn Yan Water Street Former MGP | **Project Number:** | 60648952 |
| **Client Name:** | New York State Electric & Gas | | |

## SH&E INCIDENT REPORTING

**DCS Americas Incident Hotline**

**1-800-348-5046**

TOLL-FREE | 24 HOURS PER DAY | 7 DAYS PER WEEK

Immediately report injuries, illnesses, property damage, security issues, regulatory inspections, environmental impacts/spills, and any potentially work-related injury, illness, discomfort/pain or damage.

## MEDICAL TREATMENT RESOURCES

Identify the nearest Occupational Clinic and Hospital to the site that accepts AECOM Workers Compensation Insurance (see **Attachment A** for instructions). If the nearest such clinic or hospital is an unreasonable distance from the site, identify nearer hospitals or clinics. Attach maps and directions to the clinics and hospitals in **Attachment A**.

## AECOM Occupational Nurse

**1-512-419-5016**

24 HOURS PER DAY | 7 DAYS PER WEEK

## Nearest Occupational Clinic

| | | | |
|---|---|---|---|
| **Name:** | **Wellnow Urgent Care** | **Phone Number:** | **315-230-4074** |
| **Address:** | 1 White Springs Rd Geneva, NY 14456 | | |
| **Hours of Operation:** | 8AM – 8PM | | |

## Nearest Hospital

| | | | |
|---|---|---|---|
| **Name:** | **FF Thompson Hospital** | **Phone Number:** | **585-396-6000** |
| **Address:** | 350 Parrish St Canandaigua, NY 14424 | | |

## KEY PERSONNEL

| | | | |
|---|---|---|---|
| **Project Manager (PM):** | Tamara Raby | **Contact No.:** | M 716-870-3446 |
| **Site Supervisor (SS):** | Marleiah O'Neill | **Contact No.:** | M 315-569-4616 |
| **Safety Officer (SSO):** | Marleiah O'Neill | **Contact No.:** | M 315-569-4616 |
| **Area SH&E Manager:** | Pete Wray | **Contact No.:** | M 302-660-9178 |
| **Client PM:** | John Ruspantini | **Contact No.:** | M 607-725-3801 |

NOTES: D – Direct Office Number O – General Office Number M – Mobile Device Number R – Radio Channel







Universal Health and Safety Plan Template (S4[DCS]AM-209-FM2-C)
Version 1.3 – May 28, 2020
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| Short Service Employees (AECOM and Subcontractors) < 6 months with Company in Current Job Description | ☐ Yes, see table below for details ☒ None, not applicable | | |
|---|---|---|---|
| **Name** | **Company** | **Mentor** | **Mentor's Phone Number** |
| | | | |
| | | | |
| | | | |
| | | | |

NOTES: D – Direct Office Number O – General Office Number M – Mobile Device Number R – Radio Channel

| Subcontractors (List All) | | ☒ Yes, see table below for details ☐ None, not applicable | |
|---|---|---|---|
| **Company Name** | **Task(s)** | **Site Safety Officer** | **SSO's Phone Number** |
| Nothnagle Drilling Company | Install and develop groundwater monitoring wells | Stephen DiLaura | O 585-538-2328 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

NOTES: D – Direct Office Number O – General Office Number M – Mobile Device Number R – Radio Channel



PM must positively verify subcontractors are approved in Subport (or by an equivalent evaluation process) for the work described. If there were any limitations/ conditions of approval, describe them below and how they are being met including the following (where applicable):

- ☐ Copy of their Corporate Safety Management Manual
- ☐ Copy of their Project/Site-specific health and safety plan
- ☒ Copy of task specific THAs/JHAs and daily inspection/tailgate forms
- ☐ Copy of their Pre-Qualification form
- ☐ Copy of their latest Workers Compensation Board (WCB) documents
- ☐ Copy of the signed contract
- ☐ Copy of their business license and training certificates (task specific)
- ☐ Other (Describe)

☒ I have verified that all subcontractors are approved in Subport (or equivalent), and that all conditions of approval are met.

| Tamara Raby | Tamara M. Raby | 01/27/2022 |
|---|---|---|
| Project Manager Name | Project Manager Signature | Date |

# TABLE OF CONTENTS

## Attachments

| | |
|---|---|
| Attachment A: | Hospital/Clinic Maps and Incident Reporting Flow Chart |
| Attachment B: | THA Forms, and Tailgate Safety Meeting Form |
| Attachment C. | AECOM SHE Procedures |
| Attachment D. | Stretch/Flex Poster |
| Attachment E: | Site Orientation |
| Attachment F. | Safety Data Sheets |

# REVISION LOG

| Template Revisions | | | |
|---|---|---|---|
| Version | Revised By | Date | Details of Revision |
| 1.0 | Alberto Munuera, Patrick Walz, & Gregg Ferris | 14 FEB 2020 | Initial Version, merging and replacing previous template documents (HAZWOPER HASP and Industrial/Project HASP) |
| 1.1 | Patrick Walz & Alberto Munuera | 26 MAR 2020 | Modified to add Coronavirus prevention and response guidelines |
| 1.2 | Tim Gilles, Kelly Dwyer, Scott Dietz, Lisa Rygiel, & Maria Hunt | 28 MAY 2020 | Formatting and grammar correction. Customized for universal use on high risk, Industrial and HAZWOPER projects |
| | | | |
| | | | |

| Project-Specific Revisions | | | |
|---|---|---|---|
| Version | Revised By | Date | Details of Revision |
| 0 | | | None – Original Site Health and Safety Plan |
| 1 | Tamara Raby | 1/27/22 | Update contact list and scope of work to include soil sampling. |
| 2 | Pete Wray | 1/27/2022 | HASP Review addressing additional Scope of Work. Extending HASP expiration date from 12/29/2021 to February 28, 2022 |
| 3 | | | |
| 4 | | | |

# 1. INTRODUCTION

This written Health and Safety Plan (HASP) is designed to identify, evaluate, and control safety and health hazards, and to outline emergency response actions for AECOM-managed activities. This HASP must be kept on site during work activities and made available to all workers including subcontractors and other site occupants for informational purposes. AECOM subcontractors are expected to independently characterize, assess, and control site hazards created by their specific scope of work.

This section of the HASP summarizes important AECOM SH&E Procedures that apply to all Design and Consulting Services (DCS) Americas jobs. See **Attachment B** for the Project Task Hazard Assessment (THA) forms and **Attachment C** for complete copies of applicable field SH&E Procedures.

## 1.1 Applicable References

This HASP conforms to the regulatory requirements and guidelines established in the following documents:

- Federal Occupational Safety and Health Administration (OSHA) Code of Federal Regulation Title 29, Part 1910 (29 CFR Part 1910), Safety and Health Regulations for General Industry and 29 CFR 1926, Safety and Health Regulations for Construction.
- Title 8 of the California Code of Regulations (8 CCR), with special attention to Section 5192 Hazardous Waste Operations and Emergency Response, and Section 3202, Injury Illness Prevention Program and to Sub Chapter 4, Sections 1500 - 1938 Construction Safety Orders.
- National Institute for Occupational Safety and Health/Occupational Safety and Hazards Administration/U.S. Coast Guard/U.S. Environmental Protection Agency, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, Publication No. 85-115, 1985.
- The requirements in this HASP also conform to AECOM's Safety for Life Program requirements as specified in the AECOM Safety, Health and Environment (SH&E) Manual.
- Site Management Plan, AECOM, 2020
- Long Term Monitoring Well Installation Work Plan, AECOM, 2020

## 1.2 Project Assumptions

- This is a Client-controlled site and AECOM is responsible for control of our immediate work area(s) only.
- Site management will assist in locating subsurface utilities, vessels, and structures located on the property and outside the scope of the utility locator service.
- No confined spaces will be entered on this project.
- No excavations will be entered.
- No work at heights (with fall protection) will be performed
- Work will be performed during daylight hours.

# 2. SITE DESCRIPTION

The Site, Penn Yan Water Street Former MGP, is located between Water Street and the Keuka Lake Outlet in the Village of Penn Yan, New York. One vacant building is currently present which is the building formerly used for MGP process operations. A small building is currently present near Water Street which is used by NYSEG as a gas regulating station. The remaining areas of the site consist of driveways, a parking area along Water Street, a mowed, grass-covered area in the central area of the site, and a strip of land along the outlet. The site is located in an urban setting where the surrounding land is used for residential, commercial, and industrial purposes.

Immediately to the north of the site is Water Street. Farther to the north of the street are two commercial properties. A bank is present on the corner of Water and Liberty Streets. The second property is a vacant parking lot which was formerly used for automobile sales and is currently being used as a staging area for the remediation project.

The Keuka Lake Outlet bounds the site to the south. In the reach of the outlet adjacent to the site, the outlet is approximately 95 feet wide. The land on the far side of the outlet has been developed by the Village of Penn Yan as a recreational hiking and biking trail. The water level in the outlet is controlled by the Keuka Lake Outlet Compact (KLOC) organization. The average flow rate for the outlet is 206 cubic feet per second (cfs). Retail businesses and apartments lie to the east of the project property, and to the west between the site and Liberty Street is a building which is undergoing extensive renovations, which will presumably become retail space.

## 2.1 Site Background/History

The site was initially developed as a malt house and wood storage facility. The MGP was constructed in 1899 and operated until 1931. During this period, gas was manufactured using a coal gasification process which used coal, coke, and water. Gas was disturbed to consumers through buried mains and used primarily for illumination. Several byproducts from the MGP process including coal tar, ash, and purifier waste were stored on site.

Following the decommissioning of the MGP, the site was redeveloped as a wine sales and distribution facility. A warehouse building was constructed to the west of the MGP building. The site was later used as an auto sales and repair facility. The warehouse building was converted into a garage at that time

Remediation activities initially began in 2015. Remediation work was stopped temporarily in 2017 and all parties demobilized from the site. The work resumed in 2018 and was completed in 2019. The site is subject to long term monitoring which is the planned work operation included in this HASP.

## 2.2 Client and/or Third-Party Operations at Site

AECOM will be performing oversight and engineering services (logging of well boreholes) during the installation of the long-term monitoring wells. This work will be performed by Nothnagle Drilling, Inc. of Scottsville, NY. Nothnagle will install 10 monitoring wells at the site. The borings will be advanced using Hollow Stem Auger (HSA), continuous split spoon samples will be collected and logged by AECOM.

## 2.3 Scope of Work

### 2.3.1 Project Scope and Objective(s)

The objective of this work is to complete the installation of the monitoring well network required for long term monitoring at the site and complete groundwater monitoring in accordance with the Interim Site Management Plan (ISMP) to assess the performance of the remedy completed in 2019.

AECOM will oversee the drilling subcontractor during the drilling and installation of the monitoring wells. One AECOM representative will be on site. The drilling will be conducted with Hollow Stem Auger from a truck or track mounted drill rig. AECOM will log the blow counts, soil stratigraphy, and monitoring well construction logs. AECOM will monitor for VOCs using a PID during the drilling. The subcontractor will decommission one existing monitoring well and repair the cover of one existing monitoring well. AECOM will oversee the management of Investigation-derived waste (IDW) which will be containerized at the Site. All waste soils will be containerized in a roll-off. All wastewater including decontamination water and purge water from the development of the wells will be containerized in labelled poly-tanks. Waste will be labelled and secured. Roll offs and poly-tanks will be handled by NYSEG's waste management contractor.

Two AECOM personnel will be on site for all groundwater quality monitoring and sampling. These activities will include measuring depth-to-groundwater and monitoring of groundwater quality parameters (e.g., temperature, flow, and inches of water) with the appropriate field equipment. In addition, groundwater samples will be collected from monitoring wells using dedicated, polyethylene tubing and peristaltic pumps or dedicated, polyethylene disposable bailers. The major activities involved with collecting groundwater samples from the Site include the following:

- Pre-sampling event notifications and approval,
- Set-up for sampling activities,
- Groundwater sample collection from monitoring wells and surface soil sample collection,
- Sample preparation,
- Equipment decontamination, and
- Administrative activities.

Wastewater resulting from purging of monitoring wells or equipment decontamination will be containerized and handled by NYSEG's waste management contractor. Non-hazardous IDW (i.e., normal trash) will be disposed of in a timely fashion during fieldwork activities.

### 2.3.2 Risk Register

The following tasks will be performed to achieve the project objective(s). A Task Hazard Assessment (THA) for each operation being performed by AECOM must be included in **Appendix B**, while those performed by the managed subcontractors must be prepared by the subcontractor. Oversight of managed subcontractor activities is considered a discrete AECOM task and shall also be listed below.

| Task Name | Permit(s) Required | | Task Performed By | | |
|---|---|---|---|---|---|
| | | | AECOM | SUB | Third-Party |
| Coronavirus Precautions THA | ☐ Yes | ☒ No | ☒ | ☐ | ☐ |

| Task Name | Permit(s) Required | | Task Performed By | | |
|---|---|---|---|---|---|
| | | | AECOM | SUB | Third-Party |
| Hollow Stem Auger Drilling Oversight | ☐ Yes | ☒ No | ☐ | ☒ | ☐ |
| Monitoring Well Abandonment Oversight | ☐ Yes | ☒ No | ☐ | ☒ | ☐ |
| Gauging Groundwater Monitoring Wells | ☐ Yes | ☒ No | ☒ | ☐ | ☐ |
| Groundwater Sampling – Low Flow | ☐ Yes | ☒ No | ☒ | ☐ | ☐ |
| Coronavirus Travel Precautions | ☐ Yes | ☒ No | ☒ | ☐ | ☐ |
| Coronavirus Vehicle Cleaning | ☐ Yes | ☒ No | ☒ | ☐ | ☐ |
| Surface Soil Sampling | ☐ Yes | ☒ No | ☒ | ☐ | ☐ |

## 2.3.3 Scope of Work Risk Assessment

| | | |
|---|---|---|
| ☐ | **Low Risk** | Examples: Non-intrusive work, occasional exposure and/or low risk hazards |
| ☐ | **Medium Risk** | Examples: Intrusive work, heavy equipment use, frequent exposure and/or moderate hazards |
| ☒ | **High Risk** | Examples: Complicated scope, large/multiple work crews, and/or constant exposure to hazards |



In general, the following tasks are considered High Potential (HiPo), as identified in S3AM-209-PR, Risk Assessment, based on the factors contributing to the severity and probability of credible outcomes resulting from ineffective mitigation of their hazards. Additional tasks or activities could be added to the list below based on a similar assessment their hazards and associate control measures. The following HiPo tasks will be required to complete the approved scope of work.

| | | | |
|---|---|---|---|
| ☐ | Working at heights | ☐ | Working in avalanche areas |
| ☐ | Working in a confined space | ☐ | Working on water or ice |
| ☐ | Working in a trench | ☐ | Working in remote or wilderness isolation |
| ☐ | Lock out/tag out (energy isolation) tasks | ☐ | Working in a controlled area |
| ☐ | Work on energized equipment | ☐ | Extreme heat or cold stress environments |
| ☐ | Working with electricity | ☐ | Working with power tools/equipment |
| ☐ | Working with hazardous substances or materials | ☐ | Working with/operating heavy equipment/machinery |
| ☐ | Working with material under pressure | ☒ | Working around mobile equipment |
| ☐ | Working where there is a possible threat of violence, including civil unrest | ☐ | Working in isolation from first aid services or immediate/emergency assistance |
| ☐ | Asbestos removal/contact | ☐ | Highway and road work |
| ☐ | Working on/near rail roads | | |
| ☐ | Other HiPo Task(s) [specify]: ▪ [List] ▪ [List] | | |

The following AECOM procedures provide task specific permit requirements and shall be consulted if applicable to the scope of work *(S3AM-218-PR)*:

| | | | |
|---|---|---|---|
| ☐ | S3AM-120-PR, Radiation | ☐ | S3AM-304-PR, Fall Protection |
| ☐ | S3AM-209-PR, Risk Assessment & Management | ☐ | S3AM-310-PR, Cranes & Lifting Devices |
| ☐ | S3AM-301-PR, Confined Spaces | ☐ | S3AM-325-PR, Lockout Tagout |
| ☐ | S3AM-302-PR, Electrical Safety | ☐ | S3AM-330-PR, Underground Work |
| ☐ | S3AM-303-PR, Excavation | ☐ | S3AM-332-PR, Hot Work |

## 2.4 Cleaning/Disinfecting, Housekeeping and Personal Hygiene

During the Pandemic, AECOM has identified three basic levels of cleaning that are described in our AECOM Pandemic Procedure. AECOM also requires that each location develop a Touch Point Cleaning program. Each project site shall implement a touch point cleaning program to minimize the transmission of the virus through environmental sources, specifically hard surfaces or "touch points." It is recommended that each site develop a checklist to identify the touch points specific to the site. The checklist can be initialed, dated, and signed for each touch point item to document the cleaning process. This cleaning should be conducted daily or more often as needed/desired. Contract a service or designate a person(s) and/or develop a schedule for cleaning responsibilities. Common touch points are listed below:

- Light Switches
- Equipment controls
- Cabinet and file drawer knobs/handles.
- Vending machines
- Chair arms
- Copier/printer/fax control buttons
- Shared desks and keyboards
- Shared tools and equipment
- Garage access buttons
- Handrails
- Doorknobs/handles
- Elevator buttons
- Sinks and Faucets
- Counter tops
- Tabletops
- Coffee pots
- Refrigerator
- Microwave
- Water dispensers
- Windowsills
- Portable toilet commonly touched areas
- Personal protective equipment (PPE) items



Basic housekeeping requirements for offices and work sites, as well as personal hygiene and sanitation standards can be found in S3AM-013-PR Housekeeping. Inspections will be performed at the regular interval specified below. The housekeeping inspection form S3AM-013-FM1 is available for use. Complete the table below regarding site-specific Housekeeping and Personal Hygiene requirements:

| | | |
|---|---|---|
| **Cleaning/ Disinfecting** | ***Frequency:*** | Daily |
| | ***Responsible Party:*** | Subcontractor and AECOM SSO |
| **Housekeeping:** | ***Inspection Frequency:*** | Daily |
| | ***Inspector:*** | AECOM SSO |
| **Eating, Drinking, Smoking:** | Permitted only in designated area(s) located in the vehicles or off-site. | |

| | |
|---|---|
| **Handwashing:** | Water, soap, and paper towels or equivalent supplies are located in the vehicle. Site staff will wash hands and face after completing work activities and prior to breaks or meals. |
| **Toilets:** | **Toilets** are located off site at the nearby gas station.<br>*NOTE: A minimum of one toilet must be provided for every 20 personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities, on-site facilities are **NOT** required.* |
| **Water:** | **Water** will be brought to the site in gallon jugs by the on-site personnel and stored in the vehicle. Water may be purchased at the nearby gas station or grocery store.<br>A water supply meeting the following requirements will be used:<br>*Potable Water:* An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Disposable drinking cups for single use and a waste receptacle will be provided as needed. Water containers will be refilled daily and disinfected regularly. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.<br>*Non-Potable Water:* Outlets for non-potable water shall be posted or otherwise marked in a manner that will indicate clearly that the water is unsafe and is **NOT** to be used for drinking, washing of the person, cooking, washing of food, washing of cooking or eating utensils, washing of food preparation or processing premises, or personal service rooms, or for washing clothes. **Non-potable water is water that does not meet OSHA's Sanitation standard for potable water.** All containers of non-potable water will be marked with a label stating ***"Non-Potable Water, Not Intended for Drinking Water Consumption"*** |
| **Illumination:** | **Artificial illumination** will not be provided. If natural light or installed lighting fixtures are not sufficient in the work area, toilet, and/or break area, then work activities will cease until adequate lighting is available. |

# 3. AECOM SAFETY, HEALTH, AND ENVIRONMENT PROGRAM

## 3.1 AECOM Policy

AECOM's Safety, Health and Environment Policy, which establishes the framework to attain best-in-class Safety, Health and Environmental (SH&E) performance in the interest of benefitting AECOM's employees and stakeholder in the global marketplace, is available on AECOM's Ecosystem (intranet).

## 3.2 Safety for Life


"Safety for Life" is a comprehensive integrated AECOM Safety Management System that drives our nearly 100,000 employees toward AECOM's commitment to achieving zero work-related injuries and/or illnesses; preventing damage to property and the environment; and maintaining an environmentally friendly and sustainable workplace. Our Safety for Life program is supported by nine Life Preserving Principles that apply to all AECOM activities.

## 3.3 Life Preserving Principles

AECOM has adopted these "Life-Preserving Principles" to help demonstrate the commitment of our Safety for Life program. We firmly believe these "Life-Preserving Principles" will enable AECOM to achieve its goal of zero employee injuries, property damage and an environmentally friendly and sustainable workplace. The nine Life-Preserving Principles, along with their descriptions, can be found on AECOM's Ecosystem (intranet).

**Commitment:**
Managers will lead on safety, continuously demonstrating commitment to the highest standards.

**Recognition and Rewards:**
Employees are rewarded for safety excellence and we share best practices..

**Participation:**
All employees are encouraged to engage in helping to control the risks we face.

**Orientation and Training:**
Our employees will be provided with effective safety training in order to identify and mitigate hazards in the workplace to prevent injuries to themselves and others who may be affected by their actions.

**Budgeting and Staffing for Safety:**
The costs of managing SH&E are budgeted into every project. Our safety staff are fully trained to provide expert guidance.

**Incident Investigation:**
We investigate recordabe incidents and serious near misses to understand the causes and take action to prevent recurrence.

**Pre-planning:**
We assess risks and produce detailed plans to control them during design, planning, and execution of work.

**Fit for Duty:**
All staff come to work each day fit and well, so they do not pose a hazard to themselves or others.

**Contractor Management:**
We carefully select and collaborate with all our partners to create a safe working environment.

## 3.4 Driving and Vehicle Safety

The proper operation of vehicles is critical to protecting the safety of AECOM employees and subcontractors. Drivers face numerous hazards while operating vehicles. Some of the hazards include collision with another vehicle, collision with a fixed object, vehicle break down or failure, or falling asleep or becoming otherwise incapacitated while driving. All employees will adhere to Driving procedure S3AM-005-PR, which includes the following key practices:

1. **Authorized Drivers**
   Managers must authorize drivers following evaluation of driver criteria to drive and maintain an AECOM-owned, leased or rented vehicle, a client or customer-owned vehicle, or a personal vehicle operated in the course of conducting AECOM business.

2. **Electronic Devices Prohibited**
   AECOM prohibits use of all portable electronic devices while operating a motor vehicle/ equipment, which includes being stopped at a traffic light or stop sign. Electronic devices include, but are not limited to, all mobile phones, two-way radios, pagers, iPods, MP3s, GPS, DVD players, tablets laptops, and other portable electronic devices that can cause driver distraction. Hands-free device use is **NOT** allowed.

   - GPS units and devices used for navigation may only be used if factory installed or secured to the vehicle with a bracket that allows the driver to view the image without having to take their eyes off the road. Electronic devices shall be setup for operation prior to commencing driving activities and shall **NOT** be changed by the driver while driving.

3. **Vehicle Inspections**
   The driver shall conduct pre-trip vehicle inspections prior to each trip. A vehicle inspection checklist, S3AM-005-FM2, can be used to guide and document the inspection process. Vehicle inspection is to include a 360-degree walk around and visual inspection under the vehicle for leaks and obstructions prior to moving the vehicle.

4. **Training**
   All drivers shall complete defensive driver training. Additional training (i.e., hands-on defensive driver training) may apply for medium and high-risk drivers; see Driving procedure S3AM-005-PR and SHE Training procedure S3AM-003-PR for more details.

5. **Journey Management Plan**
   Drivers who undertake trips in excess of 250 miles (400 kilometers) one way, drive in remote or hazardous areas, or when otherwise deemed necessary, shall develop and document a Journey Management Plan using S3AM-005-FM1 or equivalent.

6. **Secure Loads**
   Cargo is only to be carried within the passenger compartment of a vehicle when segregated and restrained to prevent objects from becoming distractions, obstructions, or projectiles to occupants should emergency vehicle maneuvers be required (e.g., harsh braking or crash). All

goods transported on flatbed trucks or in pickup beds must be securely fastened to prevent them from becoming hazards. All applicable laws and regulations regarding securing of loads must be met. It is prudent to check the load after a few miles to ensure that load has not shifted or loosened prior to completing the remainder of the trip.

7. **Backing Up**
   Reversing the vehicle is to be avoided if at all possible. If backing up is necessary, use the following guidelines:

   - ✓ Pre-plan all vehicle movements.
   - ✓ If the pull-through method of parking is not possible, drivers will scan parking spot/area for hazards and back in; thereby, facilitating departure where the first move is forward.
   - ✓ A light tap of the horn should be used to alert others of your intention to back up.
   - ✓ Avoid tight spaces.

Vehicles rated over 10,001 pounds (4,536 kilograms) gross vehicular weight are required to have a competent spotter in place when backing. A competent spotter is one that has received spotter training. (For additional requirements pertaining to vehicles in this weight rating, see Commercial Motor Vehicles procedure S3AM-320-PR).

All vehicles shall have a competent spotter in place when backing in an active work zone. Parking and public access areas are recommended but not required to have a spotter.



## 3.5 Fitness for Duty

One of AECOM's nine Life-Preserving Principles is Fitness for Duty (see Fitness for Duty procedure S3AM-008-PR). Fitness for Duty means that individuals are in a state (physical, mental, and emotional) that enables them to perform assignments competently and in a manner that does not threaten the health and safety of themselves or others. On certain projects or for specific tasks, fit for duty certifications may be requested of medical providers by SH&E Managers or Human Resources (HR). Employees should ensure they are fit for duty prior to leaving home and unimpaired by substances or fatigue, and if necessary, contact your supervisor rather than attempting to report to work in unfit condition. Supervisors must observe their employees and work with the employee, SH&E staff, and HR to address deficiencies. AECOM will **NOT** tolerate retaliation against any employee for filing a complaint or concern regarding their fitness for duty or participating in any way in an investigation.

### 3.5.1 Medical Surveillance

AECOM's S3AM-128-PR Medical Screening and Surveillance details the requirements to participate in a medical monitoring program. Medical Surveillance provides a streamlined process to determine if employees meet the physical requirements to perform assigned duties as defined by applicable regulations. It is also designed to provide a means to collect data relevant to exposure to chemical and physical agents for the protection of the workers and to confirm the effectiveness of health and safety programs. The scope of work outlined in Section 2.3 involves the following types of medical surveillance: HAZWOPER Baseline (Initial), Biennial and Exit Physicals.

### 3.5.2 Proactive Health

AECOM is committed to promoting proactive health activities in addition to the planning for prevention of safety and environmental incidents. Proactive health activities will be completed on an on-going basis at AECOM on a corporate-wide basis (i.e., the wellness program associated with employee benefits), at offices, and at this project site. Management will be actively involved in providing and encouraging opportunities for health and wellness education and improvement. Health initiatives and education will be discussed periodically during office-based meetings as the safety moment or during the daily tailgate meeting as a toolbox talk. Topics may be related to, but are not limited to, the following:

- ✓ Heart health
- ✓ Stress management
- ✓ Smoking cessation
- ✓ Diabetes prevention
- ✓ Diet
- ✓ Exercise benefits

Topics and educational materials can be located on the AECOM Wellness page, National Institutes of Health website, Centers for Disease Control and Prevention website, and other reputable sources online.

In addition, the field team will be encouraged to participate in a daily stretch and flex routine (a standardized way to avoid soft tissue damage from work activities) to the best of their abilities, given their own personal limits. It is particularly beneficial to warm and loosen muscles before repetitive work, manual handling of loads, and when working in cold temperatures or with static postures. The Stretch and Flex manual and poster (**Attachment D**) serve as guidance for the leader to follow.

### 3.5.3 Fatigue

One aspect of fit for duty is fatigue management. AECOM has developed procedures that limit work periods or requires additional rest under certain circumstances, including during long-distance travel or when working at high altitudes. These procedures also set limits on extended work periods of 14 hours per day or 60 hours per week. A fatigue management plan is required if longer working hours are necessary (see Fatigue Management Procedure S3AM-009-PR).

### 3.5.4 Fatigue and Driving Safety

The effect of fatigue is both physiological and psychological and can severely impair a driver's judgement. Fatigue can cause lapses in concentration which could prove fatal. Fatigue is not just a problem for drivers on long trips, as drivers can also suffer from fatigue on short trips.

- ✓ After strenuous fieldwork, consider overnight accommodation or vehicle sharing for staff who are not acclimatized to the type of work.
- ✓ Microsleep can occur with a limited warning, and may be linked to several factors, for example:
    - Microsleep is most likely to occur during times when the circadian rhythm dictates the body should be asleep, such as at dawn, late at night, or in the mid-afternoon (e.g., 1 and 4 am and 1 and 4 pm.).
    - Potential to feel drowsy after a meal.
    - Driving long distances (considered potentially monotonous) even with sufficient sleep.

- Prolonged sitting and warm ambient temperature may also increase the feeling of sleepiness.

✓ If safe to do so, consider undertaking actions to disrupt the microsleep event while identifying a safe place to stop, e.g., open a vehicle window, listen to upbeat music/change music source or ask the passenger (if present) to engage in conversation.

✓ Ensure field staff are familiar with the signs of fatigue and mitigation factors.

The most common visible signs of microsleep include the following:

- Eyelid drooping
- Eyelid closure
- Head nodding
- Brief periods of snoring
- Wandering thoughts

If any of the above become apparent, immediately pull over to a safe location and contact your PM or SH&E representative.

### 3.5.5 Substance Abuse

Drug and alcohol abuse pose a serious threat to the health and safety of employees, clients, and the general public as well as the security of our job sites, equipment and facilities. AECOM is committed to the elimination of illegal drug use and alcohol abuse in its workplace and regards any misuse of drugs or alcohol by employees to be unacceptable. AECOM Substance Abuse Prevention Procedure (S3AM-019-PR) prohibits the use, possession, presence in the body, manufacture, concealment, transportation, promotion or sale of the following items or substances on company premises. Company premises refer to all property, offices, facilities, land, buildings, structures, fixtures, installations, aircraft, automobiles, vessels, trucks and all other vehicles and equipment - whether owned, leased, or used.

- Illegal drugs (or their metabolites), designer and synthetic drugs, mood or mind altering substances, and drug use related paraphernalia unless authorized for administering currently prescribed medication;
- Controlled substances that are not used in accordance with physician instructions or non-prescribed controlled substances; and
- Alcoholic beverages while at work or while on any customer- or AECOM-controlled property.

This policy does not prohibit lawful use and possession of current medication prescribed in the employee's name or over-the-counter medications. Employees must consult with their health care provider about any prescribed medication's effect on their ability to perform work safely and disclose any restrictions to their supervisor.

Although some states may pass laws legalizing medical or recreational marijuana use, the use, sale, distribution and possession of marijuana are violations of federal law and AECOM policy, and will subject an employee to disciplinary action up to and including termination in accordance with controlling law. In Canada, where medical and recreational marijuana use is legal, employees must still follow Federal and Provincial laws, and AECOM policy with regards to use and possession. Employees found to be in contravention of legal requirements or AECOM policy will be subject to disciplinary action up to and including termination.

## 3.6 Rewards and Recognition

One of AECOM's Life Preserving Principles is Recognition and Rewards for proactive safety, health and environmentally focused behaviors. All projects are expected to participate in the rewards and recognition programs available on the Corporate and DCS Americas SH&E ecosystem pages. Large, long term projects are encouraged to establish a project specific rewards and recognition program which incorporates project specific goals and activities (template available S3AM-020-FM1). ***All rewards and recognition programs must emphasize the 9 Life Preserving Principles and proactive SH&E activities NOT solely the achievement of lagging metrics ("injury/incident-free" hours, etc.) as those may discourage incident reporting.***

There are several possible appropriate methods of rewarding and recognizing employees and contractors:

1. **Informal** – recognition via verbal acknowledgement, email, spot awards, luncheons, etc.
2. **Formal** – recognition via DCS Americas Programs:
   - AECOM Safety Star Recognition Program
   - AECOM Making a Difference (MAD) Award
   - Executive Challenge Coins



## 3.7 Hand Safety

The hands are exposed to hazards more than any body part. SH&E Hand Safety Procedure S3AM-317-PR describes requirements and best practices including these notable practices:

- **All personnel shall have gloves in their immediate possession 100%** of the time when in a shop or on a work site. Gloves that address the hazard shall be worn when employees work with or near any materials or equipment that present the potential for hand injury due to sharp edges, corrosives, flammable and irritating materials, extreme temperatures, splinters, etc. Use the Gloves Needs Assessment (S3AM-317-FM1) to help determine the appropriate glove for the hazard(s).

- **Fixed open-blade knives are prohibited** from use during the course of AECOM work. Examples of fixed open-blade knives include pocket-knives, multi-tools, hunting knives, and standard utility knives. For more information about cutting tools, see S3AM-317-ATT1 Safe Alternative Tools.

## 3.8 Safety Observations

Safety observations are observations made by employees or subcontractors of a condition or behavior which could contribute to an incident, prior to the incident occurring. Observations can also identify positive behaviors or interventions which contribute to the prevention of incidents. Large, long-term projects may benefit from the use of LifeGuard™ to track and trend observations on a site level. All other projects should log their observations using IndustrySafe™. Both reporting systems can be accessed on any safety page of Ecosystem or by using the QR codes below from a smartphone/device while off the AECOM network.

## 3.9 Newly Hired or Transferred Employees

All newly hired or transferred employees with fewer than 6 months experience working on field projects or an employee who has not completed the required training or received required certifications are considered "Short Service Employees", or "SSEs" (see the Newly Hired or Transferred Employees procedure, S3AM-015-PR). The Project Manager will identify all SSEs working on the project, and each SSE will be assigned to an experienced team member so all activities may be monitored. All SSEs working or visiting a field environment are required to wear a green hard hat for safety and identification purposes. In the event a client has an existing SSEs program, AECOM will defer to the identification system required by the client. Any new employee shall wear the designated SSE identifier until the Project Manager determines the employee has the knowledge, skills, and ability related to the specific hazard on the project.

The project scope of work does **NOT** currently involve SSEs. If it becomes necessary to use one or more SSEs to complete the project scope of work, then they will be evaluated and approved in advance by the AECOM Project Manager prior to mobilizing to site and listed in this HASP.

## 3.10 Stop Work Authority

AECOM empowers and expects all employees to exercise their Stop Work Authority (see Stop Work Authority Procedure S3AM-002-PR) if an incident appears imminent, or when hazardous behaviors or conditions are observed. A stop work request can be informal if the situation can be easily corrected or may require shutting down operations if revised procedures are necessary to mitigate the hazard. If an AECOM employee observes an imminently hazardous situation on a site controlled by others (i.e., a client-managed contractor), the employee can always stop work for themselves by removing themselves from the situation. Employees also may attempt to stop work to avoid allowing the contractor to come to harm by immediately notifying the contractor foreman or site engineer, or if necessary, the client or party managing the contractor.


No employee should object to the issuance of a stop-work request, nor can any disciplinary action be levied against the employee. All employees must agree that the situation has been mitigated before resuming work. No employee will be disciplined for refusing to work if they feel it is unsafe.

## 3.11 Lone Worker Management

AECOM discourages employees from working alone (i.e., where AECOM personnel are out of visual and audio range of others) when performing field tasks (see SH&E Procedure S3AM-314-PR, Working Alone). Note that under

no circumstances should Newly Hired or Transferred Employees be permitted to work alone, and lone workers are **NOT** permitted to perform high risk tasks. If lone work is to be performed, a communications/check-in plan must be developed. The scope of work outlined in section 2.3 does **NOT** involve the lone worker operations.

# 4. ROLES AND RESPONSIBILITIES

Roles and responsibilities for the project team are defined below. The Project Manager (PM) is ultimately responsible for the development of this HASP and establishing a budget to implement the controls and training required. The PM is also responsible for ensuring that the plan is implemented, that appropriate documentation is generated, and that records are maintained. The SH&E Manager is responsible for reviewing and approving this HASP and assisting with other SH&E matters upon request. A Site Safety Officer may be appointed to oversee implementation of the HASP in the field. All project team members are responsible for reviewing and abiding by this HASP, performing daily (or more frequent) task hazard assessments, stopping work when necessary to correct unsafe behaviors or conditions, and reporting incidents promptly to the PM and AECOM Incident Reporting Hotline.

**DCS Americas Incident Hotline: 1-800-348-5046**



## 4.1 Project Manager

The Project Manager (PM) has overall management authority and responsibility for all site operations, including safety. The PM will provide the site supervisor with work plans, staff, and budgetary resources, which are appropriate to meet the safety needs of the project operations. Some of the PM's specific responsibilities include:

- Project start-up activities require appropriate SH&E planning prior to work commencing, including identification of hazards, associated risk, and appropriate controls for each task and operation found in the work scope.
- Completed project risk registers /task hazard assessments shall be incorporated into the Project's HASP.
- Verifying that personnel, to whom this HASP applies, including AECOM subcontractors, have received a copy of it, with ample opportunity to review the document and to ask questions.
- Providing the concurring SH&E Manager with updated information regarding conditions at the site and the scope of site work if changes occur that will affect the accuracy of this HASP.
- Providing adequate authority and resources to the Site Supervisor or Site Safety Officer to allow for the successful implementation of all necessary SH&E Procedures.
- Maintaining regular communications with the Site Supervisor or Site Safety Officer and, when necessary, the AECOM Client SH&E Program Manager.
- Coordinating the activities of AECOM subcontractors and ensuring that they are aware of the pertinent health and safety requirements for these projects, when applicable.
- Conducting Safety System Auditing by way of Management Site Visits and/or Project Manager Self-Assessments on a regular basis.
- Approving amendments to the HASP (in conjunction with the Site Supervisor or Site Safety Officer).
- Coordinating activities with the client as needed to ensure the safe implementation of this HASP.

## 4.2 Site Supervisor

The Site Supervisor has the overall responsibility and authority to direct work operations at the job site according to the provided work plans and HASP. The Project Manager may act as the Site Supervisor while on site. The Site Supervisor's responsibilities include:

- Discussing deviations or drift from the work plan with the Site Safety Officer and Project Manager.
- Discussing safety issues with the Project Manager, Site Safety Officer, and field personnel.
- Assisting the Site Safety Officer with the development and implementation of corrective actions for site safety deficiencies.
- Assisting the Site Safety Officer with the implementation of this HASP and ensuring compliance.
- Assisting the Site Safety Officer with inspections of the site for compliance with this HASP and applicable SH&E Procedures.
- Reviewing Project Risk Register/ Task Hazard Assessments and Task Hazard Assessments (THAs) with the work crew.
- Reporting incidents and ensuring incidents and observations are logged into Lifeguard or IndustrySafe.
- Verifying that all operations follow the requirements of this HASP and halting any activity that poses a potential hazard to personnel, property, or the environment.
- Temporarily suspending individuals from field activities for infractions against the HASP pending consideration by the Site Safety Officer, the SH&E Manager, and the Project Manager.

## 4.3 Site Safety Officer

The Site Safety Officer supports the Site Supervisor in providing a safe work environment. Not all sites will have a designated Site Safety Officer; the decision should be made by the Project Manager and SH&E Manager taking into consideration the complexity and risks of the scope of work. The Site Supervisor may act as the Site Safety Officer on sites without one. The Site Safety Officer's responsibilities include:

- Updating the site-specific HASP to reflect changes in site conditions or the scope of work. HASP updates must be reviewed and approved by the SH&E Manager.
- Inspecting the site for compliance with this HASP and the SH&E Procedures using the appropriate field audit inspection checklist found in IndustrySafe.
- Coordinating with Site Supervisor to review THAs with the work crew.
- Assisting as needed to report incidents and verify that incidents and observations are logged into Lifeguard or IndustrySafe.

- Working with the Site Supervisor and Project Manager to develop and implement corrective action plans to correct deficiencies discovered during site inspections. Deficiencies will be discussed with project management to determine appropriate corrective action(s).
- Contacting the SH&E Manager for technical advice regarding safety issues.
- Determining emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation.
- Checking that all site personnel and visitors have received the proper training, orientation and medical clearance prior to entering the site.
- Establishing controlled work areas (as designated in this HASP or other safety documentation).
- Facilitating or co-leading daily tailgate meetings and maintaining attendance logs and records.
- Discussing potential SH&E hazards with the Site Supervisor, the SH&E Manager and the Project Manager.
- Selecting an alternate Site Safety Officer by name and informing him/her of their duties, in the event that the Site Safety Officer must leave or is absent from the site.
- Verifying that all operations follow the requirements of this HASP.
- Issuing a "Stop Work Order" under the conditions set forth in this HASP.
- Temporarily suspending individuals from field activities for infractions against the HASP pending consideration by the SH&E Manager and the Project Manager.

## 4.4 Employees

Responsibilities of employees associated with this project include, but are not limited to:

- Understanding and abiding by the SH&E Procedures specified in the HASP and other applicable safety policies, and clarifying those areas where understanding is incomplete.
- Providing feedback to SH&E management for continuous improvement relating to omissions and modifications in the HASP or other safety policies and procedures.
- Notifying the Site Supervisor or Site Safety Officer of unsafe conditions and acts.
- Stopping work if there is doubt about how to safely perform a task or if unsafe acts or conditions are observed (including subcontractors or team contractors).
- Speaking up and refusing to work on any site or operation where the SH&E procedures specified in this HASP or other safety policies are not being followed.
- Contacting the Site Supervisor or Site Safety Officer or the SH&E Manager at any time to discuss potential concerns and update the THA in the field to reflect the modifications. Provide THA feedback to the supervisor for continuous improvement

- Calling the AECOM Hotline if an SH&E incident happens (+1-800-348-5046)
- Provide THA feedback to the supervisor for continuous improvement.

## 4.5 Subcontractors

Performance of the project scope of work **does** involve the use of subcontractors, which are listed in the subcontractor section of the HASP Summary. The requirements for subcontractor selection and subcontractor safety responsibilities are outlined in AECOM Procedure S3AM-213-PR Subcontractor Management. The Project Manager is responsible for determining that the subcontractors being selected have been prequalified to work through the use of Subport or alternately stringent process as specified in the procedure. Each AECOM subcontractor is responsible for assigning specific work tasks to their employees. Each subcontractor's management will provide qualified employees and allocate sufficient time, materials, and equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required personnel protective equipment (PPE) and all required training.

Each subcontractor that will be contracting any portion of their scope of work is required to obtain authorization to use those subcontractors that were not directly hired by AECOM prior to their mobilization to site. In addition, AECOM direct subcontractor is required to communicate both AECOM and client requirements and expectations to their subcontractors. The AECOM PM is required to confirm that all subcontractors used on the project meet both AECOM and client Safety, Health and Environment (SH&E) Evaluation Criteria, requirements and expectations. This includes confirming that individuals are competent to perform their assigned tasks and duties, obtaining authorization to use one or more short-service employees, and confirming that verification of competency can be provided upon request. In addition, the Project Manager must approve the use of all subcontractors (no matter the level) prior to their mobilization to site.

AECOM considers each subcontractor to be an expert in all aspects of the work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services as well as all other requirements applicable to their work. Each subcontractor is expected to perform its operations in accordance with its own unique safety policies and procedures applicable to work that is exclusive to their activities on the site, and for which they may have superior knowledge. All subcontractor procedures must at a minimum comply with client and AECOM requirements in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided to AECOM for review prior mobilization to the site.

Hazards not listed in this HASP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the AECOM Project Manager or the Site Supervisor prior to beginning work operations. The Site Supervisor or authorized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner.

## 4.6 Visitors

Authorized visitors (e.g., client representatives, regulators, AECOM management staff, etc.) requiring entry to any work location on the site will be briefed by the Project Manager, Site Supervisor, or Site Safety Officer on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for

compliance with their employer's health and safety policies. In addition, this HASP specifies the minimum acceptable qualifications, training and PPE that are required for entry to any controlled work area; visitors must comply with these requirements at all times.

If the site visitor requires entry to any exclusion zone (EZ), but does not comply with the above requirements, the visitor will be denied access to the EZ. If the visitor disregards instructions to remain outside the EZ, work activities will be immediately suspended, and the situation reported and documented.

Unauthorized visitors, and visitors not meeting the specified qualifications, will **NOT** be permitted within established controlled work areas. If unauthorized visitors and/or visitors not meeting the specified qualifications enter a controlled work area and/or EZ, work activities will be immediately suspended, and the situation reported and documented.

# 5. TRAINING AND DOCUMENTATION

The following sections describe the standard practices or programs that AECOM will establish to prepare employees to perform work safely and consistent with AECOM policy and Procedures.

## 5.1 HASP/Site Orientation

The Project Manager shall conduct a project/site-specific HASP orientation prior to the start of field operations, with support as needed by the SH&E Manager, Site Safety Officer, or Site Supervisor. This meeting will involve representatives from all organizations with a direct contractual relationship with AECOM on the job site. Minimum items to be covered are listed in **Attachment E**. Participants will then sign the HASP Personnel Acknowledgement register at the end of the HASP.

## 5.2 Daily Tailgate Meetings and THA Reviews

The Site Supervisor, Site Safety Officer or designee shall facilitate a tailgate meeting to discuss the specific requirements of this HASP and review the applicable THAs prior to the commencement of daily project activities. Attendance at the daily tailgate meeting is mandatory for all employees and subcontractors at the site contracted to AECOM. Simultaneous operations are encouraged to attend each other's tailgate meetings or at the very least the supervisors shall discuss the coordination of activities and associated hazards of each other's tasks. The supervisor will then convey the information to the work crew. The Tailgate Meeting must be documented by the Site Supervisor or Site Safety Officer on a Daily Tailgate Meeting form, a blank copy of which is included in **Attachment B**.

As part of the daily tailgate meeting, employees and subcontractors will be encouraged to voluntarily warm up and stretch select muscle groups to the best of their ability and within each person's individual limitations. Stretching is particularly beneficial to warm and loosen muscles before repetitive work, manual handling of loads, and when working in cold temperatures or with static postures. The exercises included in Attachment D may be used to facilitate these efforts.

## 5.3 Worker Training and Qualifications

All personnel at this site must be qualified and experienced in the tasks they are assigned. SH&E Training Procedure S3AM-003-PR establishes the general training requirements for AECOM employees.

Check all required training on the table below. Verify training records of employees and subcontractors.

**Site Specific Training Requirements**

| Training | | Applies to |
|---|---|---|
| ☒ | ERP/HASP and Site Orientation | All Employees and Subcontractors |
| ☒ | Vehicle/Driver Safety & Defensive Driving | All Employees who drive on behalf of AECOM |
| ☐ | Field Safety | Employees visiting the field that does not require HAZWOPER |

**Site Specific Training Requirements**

| Training | | Applies to |
|---|---|---|
| ☒ | Speak Up/Listen Up (SULU) | All AECOM field employees and supervisors |
| ☐ | First Aid / CPR | Designated employees or employees performing high risk activities and medical attention is more than 4 minutes away |
| ☐ | Respiratory Protection & Fit Test | Employees needing to wear respirators |
| ☒ | OSHA 10-Hr. Construction Safety (or CSTS 2020 in Canada) | Refer to Section 5.3.1 for guidance |
| ☐ | OSHA 30-Hr. Construction Safety | Refer to Section 5.3.1 for guidance |
| ☒ | HAZWOPER 40-Hour and 8-Hr. Annual Refresher | On HAZWOPER sites, in EZ, exposed to hazardous contamination |
| ☐ | HAZWOPER Supervisor | Employees managing others in HAZWOPER activities or at HAZWOPER Sites |
| ☐ | Hazardous Materials Shipping (U.S.) | Employee responsible for shipping HZM/HZW/DG and/or signing manifests |
| ☐ | Transportation of Dangerous Goods (CAN) | Employees responsible for shipping/transporting regulated hazardous materials that exceed regulatory requirements |
| ☐ | Annual Medical Surveillance / Clearance | Employees working in an exclusion zone and the regulatory required exposure limit **is** exceeded for 30 or more days a year |
| ☐ | Biennial Medical Surveillance / Clearance | Working in an exclusion zone more than 30 days a year and the regulatory required exposure limit is **NOT** exceeded |
| ☐ | Under Bridge Inspection Unit (UBIU) AECOM University module | Employees working in a UBIU |
| ☒ | All-Hands Coronavirus Training: | All Employees performing work during the COVID-19 Pandemic |
| ☐ | Local and/or Client Requirements: | [If applicable, specify] |



## 5.3.1 OSHA 10-Hr. (or CSTS 2020)/OSHA 30-Hr. Training

OSHA 10 (or CSTS 2020 in Canada) and OSHA 30 training is required for projects with construction, demolition or construction/industrial-like hazards. "Construction//industrial-like hazards" occur on sites where the focus is **not** construction/industrial activities, but where our scope includes work activities involving work at heights, confined space, hot work, and/or lifting/hoisting loads or work around heavy construction equipment or "yellow iron." Examples of heavy construction equipment include excavators, bull dozers, graders, articulated dump trucks, pile drivers, and large air or mud rotary drill rigs. Smaller equipment like bobcats, road worthy commercial trucks, and hollow-stem auger drill rigs would not be considered heavy construction equipment.

This training is needed if this type of work is being performed within our work area or if it may impact our work area. It is not applicable if our work area is separated from the construction/demolition/industrial area with enough distance or physical barriers that fully prevent exposure of our team to those hazards. This includes projects where we serve as Inspectors, or any work where our employees are exposed to construction/industrial site hazards.

OSHA 30 hr. training is required for supervisors in the United States. The term "supervisor" has many different

meanings. The requirement to complete the OSHA 30 hr. course will be based on field supervisory roles and responsibilities, not administrative supervision roles. Field supervisors required to take the OSHA 30 course are defined as those individuals who provide work direction and leadership directly to AECOM field personnel and/or our subcontractors for construction/demolition activities or tasks that have construction/industrial-like hazards. These supervisors must be knowledgeable of construction hazards and controls because they are responsible for:

- Field implementation of a construction/demolition scope of work;
- Controlling performance on the job site;
- Evaluating and controlling hazards & preventing site safety risks; and
- Intervening to prevent unsafe actions or conditions of employees, clients, and subcontractors related to construction/demolition hazards.

## 5.4 Competent Person

A competent person is an employee who, through education, training, and experience, has knowledge of applicable regulatory requirements, is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

AECOM's Competent Person Designation Procedure, S3AM-202-PR, explains the roles, responsibilities and procedures of naming a competent person. Complete the table below and include an S3AM-202-FM1 Competent Person Designation Form for each AECOM competent person (subcontractors to use an equivalent process). The following activities require and have been assigned a competent person:

**Competent Person Log**

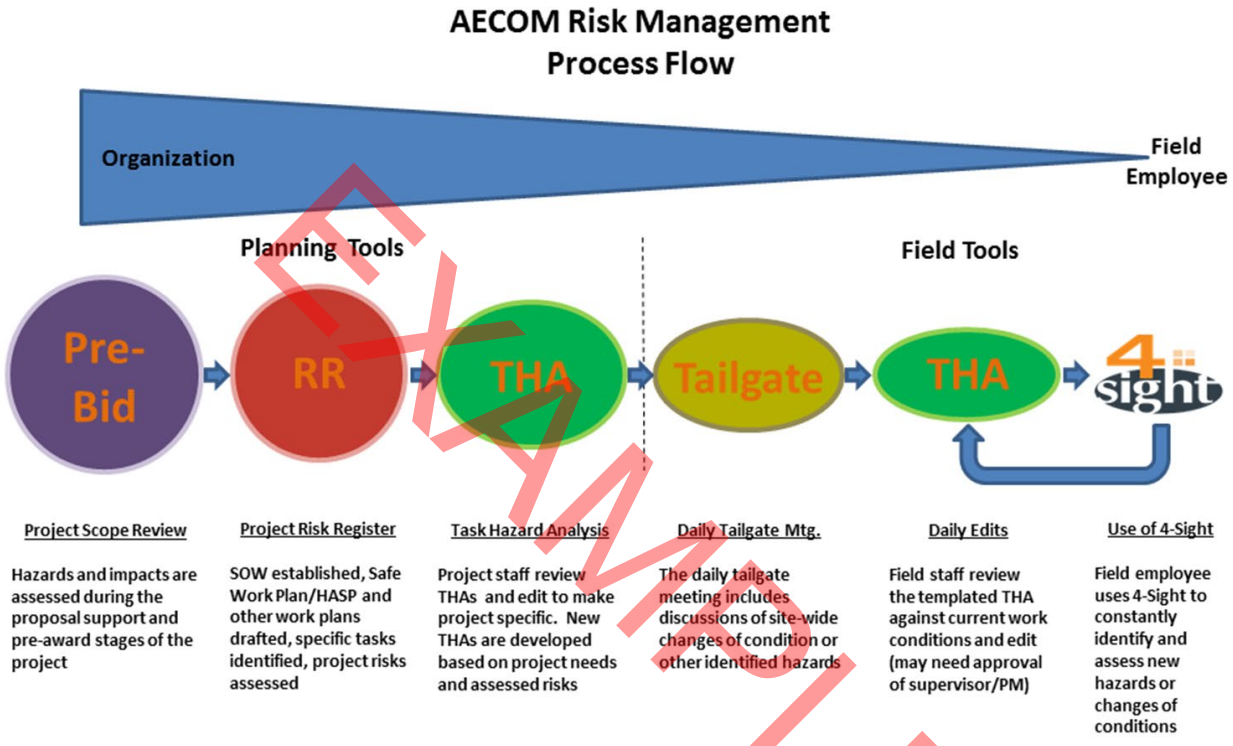
| | Activity / Area of Competency | Name of Person (Affiliation)<br>Note: Subcontractor may provide this person |
|---|---|---|
| ☐ | Asbestos | |
| ☐ | Assured Equipment Grounding Conductor | |
| ☐ | Blasting & Explosives | |
| ☐ | Concrete & Masonry Construction | |
| ☐ | Confined Spaces | |
| ☐ | Control of Hazardous Energy (Lockout-Tagout) | |
| ☐ | Crane Assembly / Disassembly | |
| ☐ | Cranes & Derricks | |
| ☐ | Demolition | |
| ☐ | Electrical Wiring Design & Protections | |
| ☐ | Elevated Work Platforms & Aerial Lifts | |
| ☐ | Fall Protection | |
| ☒ | Hearing Protection | Nothnagle competent person |
| ☒ | Heavy Equipment | Nothnagle competent person |

## Competent Person Log

| Activity / Area of Competency | | Name of Person (Affiliation)<br>Note: Subcontractor may provide this person |
|---|---|---|
| ☐ | Ionizing Radiation | |
| ☐ | Lead | |
| ☐ | Material Hoists & Personnel Hoists | |
| ☐ | Respiratory Protection | |
| ☐ | Rigging Equipment | |
| ☐ | Scaffolds | |
| ☐ | Stairways & Ladders | |
| ☐ | Steel Erection | |
| ☐ | Trench & Excavations | |
| ☐ | Underground Construction | |
| ☐ | Welding & Cutting | |

# 6. HAZARD ASSESSMENT AND CONTROL

AECOM has adopted an approach to hazard assessment and control that incorporates both qualitative and quantitative methods to identify hazards and the degree to which they may impact employees and AECOM operations. See S3AM-209-PR, Risk Assessment and Management, for details regarding AECOM's process. This approach is illustrated below and described in the following section.






## 6.1 SH&E Procedures

All AECOM SH&E procedures, in their controlled copy version, are available on the internal SH&E Policy and Procedures ecosystem page. Programmatic procedures referenced in this document (for example SH&E Training) do no need to be printed for inclusion in this HASP. The applicable field procedures checklist is in the Physical Hazards section below and procedures are included in **Attachment C**.

## 6.2 Task Hazard Assessments (THAs) and Daily Tailgate Meeting Form

THA forms (a blank version is located in S3AM-209-PR) shall be prepared for each task to be performed as part of the scope of work. This includes driving to the site, parking, and walking as well as the hazards, associated risk, and appropriate controls for all other work activities. The DCS Americas Templated THA Library may also be used to find

previously approved THAs, though these should be modified to be project and site-specific. The preparer shall have one THA form for each task in the Scope of Work found in this work plan (**Attachment B)** and shall also include blank copies.

In the field, all employees and visitors shall review the daily the THAs and complete and sign the Daily Tailgate Meeting Form S3AM-209-FM5. Many times, when employees arrive in the field, situations are different than originally planned for or additional job steps are required. The THA asks workers update or 'dirty up' the THA in the 'On-Site Edits' rows to assess the risks presented by the changed condition and requires the worker to describe steps to reduce the risk. If the hazard(s) cannot be successfully mitigated, the work is **NOT** allowed to proceed.

### 6.2.1 Hazard Categories

THAs should include consideration of the following hazard categories when identifying hazards and task specific controls:



| Category | Definition |
|---|---|
|  | A biological hazard is any living organism that could cause irritation, allergic reaction, bites, stings, illness, infection, or other injury. |
|  | A chemical hazard is any chemical substance that could potentially cause harm to humans, equipment, or the environment either through contact, ingestion, absorption, inhalation, or reaction. |
|  | Electrical hazards are present whenever there is potential for contact with an electric charge. |
|  | Gravitational force can cause tools, equipment, materials, and people to fall either to the same level or from heights to the earth or a lower surface. |
|  | A mechanical hazard when there is energy within the components of a mechanical system within an otherwise stationary piece of equipment/machinery. |
|  | Objects or substances that can move or are moving not due to gravity create a motion hazard. Motion hazards also include body motions and positioning such as bending, stretching, kneeling, etc. |
|  | Noise hazards are sounds that may prevent effective communication or cause hearing loss. |
|  | Any physical matter such as gases, liquids, and springs that is compressed or under a vacuum creates a pressure hazard. |
|  | Radiation hazards include both ionizing and non-ionizing energy emitted from radioactive elements or sources. |
|  | Thermal hazards can cause injury or damage due to their temperature. |

## 6.3 4 Sight

When preparing hazard assessments and throughout the day workers should use 4-Sight. This is a mental process through which workers ask themselves (and each other) four questions designed to effectively assess hazards. Using these questions during each task, especially those without established THAs, will help workers identify hazards and condition changes so that they can control them or stop work to seek assistance.


- **What am I about to do?**
- **What could go wrong?**
- **What could be done to make it safer?**
- **What have I done to communicate the hazard?**

## 6.4 Speak Up/Listen Up

All AECOM employees have a responsibility to help create the environment where the expectation is Safety for Life. Speak Up/Listen Up (SULU) is a technique to steward jobsite safety by utilizing 4-Sight as a basis for safety feedback conversations. SULU has two main parts:

- **Speak Up** where employees use three simple steps when providing feedback to others about unsafe acts:
  - Ask to discuss their hazard assessment or 4-Sight for the task;
  - Get a commitment from the employee to apply the hazard controls and perform the task according to the accepted procedures; and
  - Follow up to ensure the employee is working safely

- **Listen Up** where employees use two simple steps when responding to safety feedback:
  - Listen – Focus on the message, not the messenger; and
  - Commit to performing the task the safer way

SULU conversations should happen consistently throughout the workday to create clear expectations of how work should be performed. All employees should recognize safe work behaviors in order to reinforce them and keep them going. An occasional correction is much more effective when employees are frequently encouraged and positively recognized for their safe actions. Managers and supervisors should be having SULU conversations during site visits and ensure peer to peer and site supervisor to crew SULU conversations are being held.

# 7. PHYSICAL AND BIOLOGICAL HAZARD ASSESSMENT

A physical hazard is a hazard that threatens the physical safety of an individual; contact with the hazard typically results in an injury. The following table summarizes the physical hazards or activities containing physical hazards present at the site and the associated procedures that address protection and prevention of harm.

All checked procedures MUST be included in **Attachment C** for implementation and reference. The following hazards and their site specific description are anticipated based on the scope of work and project site:

| Hazard/ Activity (Note: Text in this column links to procedure) | Site Specific Description (Where, What Phase of Work, Frequency, Etc.) | Applicable Procedure |
|---|---|---|
| ☐ Abrasive Blasting | | S3AM-335-PR |
| ☐ Aerial Work Platforms | | S3AM-323-PR |
| ☐ All-Terrain Vehicles | | S3AM-319-PR |
| ☐ Blasting and Explosives | | S3AM-336-PR |
| ☐ Bloodborne Pathogens | | S3AM-111-PR |
| ☐ Cofferdams | | S3AM-344-PR |
| ☒ Cold Stress | Continuous exposure when ambient air temperature is below 32 °F (0 °C) **or** when ambient air temperature is below 50 °F (10 °C) with wet/damp conditions. | S3AM-112-PR |
| ☐ Compressed Air Systems and Testing | | S3AM-337-PR |
| ☐ Compressed Gases | | S3AM-114-PR |
| ☐ Concrete Work | | S3AM-338-PR |
| ☐ Confined Spaces | | S3AM-301-PR |
| ☐ Corrosive Reactive Materials | | S3AM-125-PR |
| ☐ Cranes and Lifting Devices | | S3AM-310-PR |
| ☐ Demolition | | S3AM-339-PR |
| ☐ Diving (scientific and commercial) | | S3AM-334-PR |
| ☒ Drilling, Boring & Direct Push Probing | Oversight of monitoring well installation by subcontractor | S3AM-321-PR |
| ☐ Electrical Safety | | S3AM-302-PR |
| ☐ Excavation & Trenches | | S3AM-303-PR |
| ☐ Fall Protection | | S3AM-304-PR |
| ☒ Flammable and Combustible Liquids | Gasoline used in cars/trucks | S3AM-126-PR |
| ☐ Gauge Source Radiation | | S3AM-122-PR |
| ☒ Hand and Power Tools | Accessing monitoring wells | S3AM-305-PR |
| ☒ Hazardous Waste Operations | Generating IDW during drilling, well development, and groundwater sampling | S3AM-117-PR |

| Hazard/ Activity (Note: Text in this column links to procedure) | Site Specific Description (Where, What Phase of Work, Frequency, Etc.) | Applicable Procedure |
|---|---|---|
| ☒ Heat Stress | Continuous exposure when ambient air temperature is above 80 °F (26.6 °C) and a standard work uniform is worn **or** when ambient air temperature is above 70 °F (21.1 °C) and impermeable chemical protective clothing is worn. | S3AM-113-PR |
| ☒ Heavy Equipment | Oversight of monitoring well installation (drilling) by subcontractor | S3AM-309-PR |
| ☐ High Altitude | | S3AM-124-PR |
| ☐ Highway and Road Work | | S3AM-306-PR |
| ☐ Hoists Elevators and Conveyors | | S3AM-343-PR |
| ☐ Hot Work | | S3AM-332-PR |
| ☐ Ladders | | S3AM-312-PR |
| ☐ Lockout Tagout | | S3AM-325-PR |
| ☐ Machine Guarding Safe Work Practice | | S3AM-326-PR |
| ☐ Marine Safety and Vessel Operations | | S3AM-333-PR |
| ☐ Material Storage | | S3AM-316-PR |
| ☐ Mine Site Activities | | S3AM-341-PR |
| ☐ Mining Operations | | S3AM-345-PR |
| ☒ Noise | Oversight of monitoring well installation (drilling) by subcontractor | S3AM-118-PR |
| ☐ Non-Ionizing Radiation | | S3AM-121-PR |
| ☒ Overhead Lines | Oversight of monitoring well installation (drilling) by subcontractor – overhead lines near roadway | S3AM-322-PR |
| ☒ Pandemic Virus | Potential exposure during travel and field task(s) | SR1-003-PR2 |
| ☐ Powder-Actuated Tools | | S3AM-327-PR |
| ☐ Powered Industrial Trucks | | S3AM-324-PR |
| ☐ Radiation | | S3AM-120-PR |
| ☐ Railroad Safety | | S3AM-329-PR |
| ☐ Respiratory Protection | | S3AM-123-PR |
| ☐ Scaffolding | | S3AM-311-PR |
| ☐ Steel Erection | | S3AM-340-PR |
| ☐ Temp. Floors, Stairs, Railings, Toe-boards | | S3AM-342-PR |
| ☒ Underground Utilities | Oversight of monitoring well installation (drilling) by subcontractor – borings to be pre-cleared | S3AM-331-PR |
| ☐ Underground Work | | S3AM-330-PR |
| ☒ Wildlife, Plants and Insects | May be encountered while overseeing well installation or gauging and sampling wells | S3AM-313-PR |

| Hazard/ Activity<br>(Note: Text in this column links to procedure) | Site Specific Description<br>(Where, What Phase of Work, Frequency, Etc.) | Applicable Procedure |
|---|---|---|
| ☐ Working Alone | | S3AM-314-PR |
| ☐ Working on and Near Water | | S3AM-315-PR |

## 7.1 Pandemic Virus

COVID-19 is a disease that results from infection of the virus identified as SARS-CoV-2. SARS-CoV-2 is a Coronavirus, one of a large family of viruses found in both animals and humans. Some infect people and are known to cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) with symptoms such as fever, cough, and shortness of breath. There currently is no human vaccine available for this virus.

Key AECOM resources can be found at the AECOM Ecosystem Coronavirus Information Center on the Ecosystem homepage or at this link, the Coronavirus Smart Card, and the AECOM Pandemic Procedure: SR1-003-PR2. Additional resources can be found at the following non-AECOM websites:

- Center for Disease Control and Prevention (CDC).
- World Health Organization (WHO).

# 8. CHEMICAL HAZARD ASSESSMENT

A chemical hazard is a type of occupational hazard caused by exposure to chemicals in the workplace. Exposure to chemicals in the workplace can cause acute or long-term detrimental health effects. Potential exposure to chemical hazards on AECOM projects can come from several sources including materials brought on site to perform work, constituents of concern found in environmental media under investigation, and simultaneous operations being performed at the site by the property owner/third parties.

## 8.1 Potential Exposure Pathways

Occupational exposure to chemical hazards associated with the work activities could potentially occur by two primary routes (inhalation and skin contact) and one indirect route (incidental ingestion). These exposure pathways are discussed below.

### 8.1.1 Inhalation

The primary risks associated with AECOM's scope of work pertain to potential exposure to airborne contaminants and explosion hazards. Constituents that potentially pose an occupational concern to employees by the inhalation route are carbon monoxide, hydrogen sulfide, methane, and volatile organic compounds. Air monitoring may be performed in the work area and within the employee's breathing zone to assess the need to implement appropriate control measures or stop work. In addition, air monitoring will be performed at the source to assess potential explosion hazards. See Section 9, Air Monitoring for additional information regarding the air monitoring requirements for this project.

### 8.1.2 Skin Contact (Absorption)

Personnel handling residual product or waste and associated equipment may be exposed to chemical hazards by skin contact or adsorption. However, exposure is expected to be limited since workers will be required to wear appropriate PPE (i.e., appropriate work gloves, body clothing, and/or face shield).

### 8.1.3 Ingestion

Personnel handling residual product or waste and associated equipment, including project hazardous materials, may be exposed by incidental ingestion. Typically, this exposure occurs if proper PPE was not used or personal hygiene was not practiced. Personal protection against exposure via ingestion can be accomplished by performance of proper decontamination procedures when exiting contaminated work areas as well as using the correct PPE.

### 8.1.4 Sources of Potential Chemical Exposures

Depending on the source of potential chemical hazard and the likelihood of exposure, certain measures will be taken to protect AECOM employees as specified below.

| | |
|---|---|
| ☐ | Exposure to chemical hazards is **NOT** anticipated |
| ☐ | Hazardous chemicals will be used to perform the work (see Section 8.2) |
| ☒ | Exposure to constituents of concern found in environmental media is likely (See Section 8.3) |
| ☐ | Exposure to chemical hazards is possible due to activities of the site owner or other parties (see Section 8.4) |

## 8.2 Hazardous Materials Communication

Hazardous materials that will be used on the site to perform the work can include a variety of products including sample preservatives, grout, concrete, paints, adhesives, decontamination solutions, etc. Safety data sheets (SDSs) must be available for all hazardous products that will be stored or used on the site that exceed usual household quantities.

Their properties, hazards, and associated required controls will be communicated to all affected staff and subcontractors in accordance with the requirements of AECOM Procedure S3AM-115-PR Hazardous Materials Communication including these key elements:

- All personnel shall be briefed on the hazards of any chemical product they use and shall be aware of and have access to the Safety Data Sheets (SDS).
- All containers on site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

In addition, any employee or organization (contractor or subcontractor) intending to bring any hazardous material onto this AECOM-controlled work site must first provide a copy of the item's SDS to the Site Supervisor or Site Safety Officer for review and filing. The Site Supervisor or Site Safety Officer will maintain copies of all SDS on site and in **Attachment F**. SDS may not be available for locally obtained products, in which case an alternate form of product hazard documentation will be acceptable.

See S3AM-110-PR, Toxic and Hazardous Substances, for information on planning, training, monitoring, and details on several specific chemicals (Benzene, Cadmium, Chromium, Hydrogen Sulfide, Lead, and Silica).

## 8.3 Constituents of Concern

Based on information obtained from historical investigations and other sources, the chemicals in the table below are known or suspected to be present at the site.

**Summary of Hazardous Properties of Contaminant Exposure Hazards**

**Notes:** **PEL……..Permissible Exposure Limit** **IP……..Ionization Potential**
**TLV……..Threshold Limit Value** **eV……..Electron Volt**

| Chemical Name | Media | Primary Routes of Exposure | PEL | TLV | IP (eV) |
|---|---|---|---|---|---|
| **Other Common Site COCs** | | | | | |
| Benzene | Soil | Inhalation | 1 ppm | 0.5 ppm | 9.25 |
| Coal tar pitch hydrocarbons PAH | Soil | Inhalation | 0.2 mg/m$^3$ | 0.2 mg/m$^3$ | n/a |
| Naphthalene | Soil | Inhalation | 10 ppm | 10 ppm | n/a |
| Dust | Soil | Inhalation | 15 mg/m$^3$ | 10 mg/m$^3$ | n/a |
| Ethylbenzene | Soil | Inhalation | 100 ppm | 20 ppm | 8.77 |
| Toluene | Soil | Inhalation | 200 ppm | 20 ppm | 8.82 |
| Xylene | Soil | Inhalation | 100 ppm | 100 ppm | 8.45, 8.56 |
| Cyanide | Soil | Dermal | 5mg/m3* | 4.7 ppm** | n/a |

Notes:

* OSHA PEL for cyanide salts or mist has been withdrawn. OSHA STEL (15 minute) is 5 mg/m3 based on skin contact.

** OSHA PEL and ACGIH TLV for hydrogen cyanide vapors is 4.7 based on skin contact.

### 8.3.1 Decontamination

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities. Decontamination steps are outlined in Section 4.7 of the Hazardous Waste Operations procedure S3AM-117-PR. Some key elements are as follows:

- All persons and equipment entering the EZ shall be considered contaminated, and thus, must be properly decontaminated prior to exiting to clean areas of the site.
- Avoid reactions between the solutions and contaminated materials. Review the applicable SDS.
- All contaminated PPE and decontamination materials shall be contained, stored and disposed of in accordance with site-specific requirements determined by site management.
- Use caution while working around decontamination stations, including the decontamination pad, which may be a slip or trip hazard.
- Use disposable equipment when possible and practical.
- All employees performing equipment decontamination shall wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of PPE required in the EZ. Other PPE may include splash protection, such as face-shields and splash suits, and knee protectors.

All decontaminated equipment shall be visually inspected for contamination prior to leaving the Contaminant Reduction Zone (CRZ).

**Decontamination Procedures & Equipment**

| Procedure | Equipment Needed |
|---|---|
| Remove all equipment, sample containers, and field notes to CRZ. | Alconox solution |
| Obtain decontamination solutions and decontaminate the tools (shovels, auger flights, etc.) by brushing them under a water rinse. A high-pressure steam cleaner may also be used for decontamination. All waste and spent decontamination solutions will be properly contained. | Deionized water |

| Decontamination Procedures & Equipment | |
|---|---|
| **Procedure** | **Equipment Needed** |
| Remove gloves | Brushes |
| Wash hands | Plastic sheeting |

| Equipment Decontamination Procedures | | |
|---|---|---|
| **Type Equipment** | **Decontamination Solution** | **Procedure** |
| Water quality meter, oil/water interface probe, down-hole water sampling pumps, reusable sampling tools and equipment | Alconox solution and deionized water | Washing: Disassemble and wash with an Alconox solution in deionized water.<br>Rinsing: Rinse in deionized water to remove all traces of detergent. |
| | | |
| | | |

| Waste Handling for Decontamination | |
|---|---|
| **Waste Streams/Products** | **Disposal Procedures** |
| Wash water | Contain in labelled poly-tank |
| Used PPE | Contain in appropriately labelled 55-gallon drum, seal drum and securely stage in a temporary location for off-site disposal by NYSEG approved waste contractor |
| Spent plastic sheets/consumables from decontamination procedures | Contain in appropriately labelled 55-gallon drum, seal drum and securely stage in a temporary location for off-site disposal by NYSEG approved waste contractor |
| | |



## 8.4 Site Chemical Hazards Outside AECOM Control

AECOM frequently performs work at Client sites that are engaged in chemical manufacturing or use chemicals as part of the manufacturing process. These types of operations can potentially expose AECOM and AECOM subcontractors to chemicals. The following mitigation measures should be applied to all work performed on these sites.

- Be familiar with the facility emergency alarms/alerts
- Know where the assembly areas are for each area of proposed site activity (note that assembly areas may be dependent on the direction of the prevailing wind)
- Be familiar with the products used on site and the appropriate response measures (may differ based on location on site)
- Discuss the above as part of daily tailgate meetings.

The client or host facility/site does not engage in chemical manufacturing or use chemicals as part of their manufacturing process. Therefore, a potential exposure to site chemical hazards outside of AECOM's control is not anticipated.

# 9. AIR MONITORING

Depending on the contaminants of concern, the products used to perform the work, or third-party operations, sampling or monitoring may be required within the work area on site to detect the presence and relative levels of chemical or particulate hazards. The data collected throughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be in accordance with Exposure Monitoring Procedure S3AM-127-PR and specified in the work permit and/or THA for the tasks. Key elements of the procedure include:

- Calibration of monitoring equipment and/or daily bump tests to verify calibrations and confirm alarm function.
- Documenting the results of calibration and/or daily bump tests.
- Documenting the results of monitoring activities.
- Personal monitoring and result evaluation must be directed by a Certified Industrial Hygienist or Certified Safety Professional.

Potential exposure to chemical hazards from sources including materials brought on site to perform work, constituents of concern found in environmental media under investigation, and/or simultaneous operations being performed at the site by the property owner/third parties are reasonably anticipated to have the potential to result in vapors, fumes, aerosols, mists, and/or airborne particulates/dusts at or near permissible exposure limits. Therefore, air monitoring that will be implemented is described below.



## 9.1 Real-Time Exposure Measurements/Equipment

Monitoring shall be performed within the work area on site in order to detect the presence and relative levels of toxic substances. The data collected throughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be conducted as specified in the work permit and THA as work is performed. All instrumentation needs to be rated intrinsically safe to prevent fire or explosion.

| | Instrument | Manufacturer/Model | Substances Detected |
|---|---|---|---|
| ☒ | Photo Ionization Detector (PID) | RAE Systems mini-RAE<br>Photovac Microtip<br>HNu Model Hnu<br>(min. 10.6 eV bulb) | • Petroleum hydrocarbons<br>• Organic Solvents |
| ☐ | Multi or 4 Gas Detectors | RAE Systems Multi-RAE | • Lower Explosive Limit<br>• Oxygen<br>• Carbon Monoxide<br>• Hydrogen Sulfide |
| ☐ | Combustible Gas Indicator (CGI)<br>*May be combined with individual or multi-gas detectors.* | | • Explosivity |
| ☐ | Particulate Monitor | MIE Model PDM-3 mini-RAM | • Aerosols, mist, dust, and fumes |

| Instrument | Manufacturer/Model | Substances Detected |
|---|---|---|
| ☐ Personal Monitoring/ Badges | [insert] | • [insert] |

## 9.2 Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone.

If ambient levels are measured which exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and mitigation actions to limit, etc.) must be implemented prior to commencing activities at the specific work area.

Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of Site Supervisor or Site Safety Officer or the Safety Manager.

**Reasons to Upgrade:**
- Known or suspected presence of dermal hazards;
- Occurrence or likely occurrence of gas, vapor, or dust emission; or
- Change in work task that will increase the exposure or potential exposure to hazardous materials.

**Reasons to Downgrade:**
- New information indicating that the situation is less hazardous than was originally suspected;
- Change in site conditions that decrease the potential hazard; or
- Change in work task that will reduce exposure to hazardous materials.

## 9.3 Monitoring Procedures

The monitoring procedures shown below are general guidelines for sampling activities. In general, readings are considered actionable if sustained readings are observed for 5 minutes or more or if intermittent peaks are seen in excess of 1 time the response level. A reading in excess of action level outlined below will require additional ventilation (natural or mechanical) for 30 minutes, followed by re-monitoring.

**Monitoring Procedures and Action Levels**

| Parameter | Zone Location and Monitoring Interval | Response Level | Response Activity |
|---|---|---|---|
| **Volatile Organic Compounds (VOCs) and volatile hydrocarbons** (total by PID) | Breathing zone, continuously during tasks where exposure to VOCs and volatile hydrocarbons is possible | < 5 ppm | Continue monitoring, may continue work in required PPE |
| | | 5- 25 ppm (sustained for 5 minutes) | STOP WORK and notify PM. Investigate the cause of elevated VOC measurements and identify measures to reduce concentrations (cover impacted soils, ventilation, etc.). Work activities shall only continue once levels have decreased to or below 5 units above background. If levels continue above 5 units, only individuals who are medically qualified to wear respiratory protection are permitted to continue work activities with Project Manager approval. Don Level C PPE (organic vapor respirator cartridges), continue |

**Monitoring Procedures and Action Levels**

| Parameter | Zone Location and Monitoring Interval | Response Level | Response Activity |
|---|---|---|---|
| | | | monitoring, and initiate continuous air monitoring for benzene. |
| | | > 25 ppm (sustained for 5 minutes) | Cease work, exit, and contact the Site Safety Officer, Site Supervisor, and Project Manager. |
| **Benzene** (by PID with benzene-specific separation tube) | Breathing zone, continuously where indicated by VOC readings | > 0.25 ppm | Cease work, exit the area, and contact the Site Safety Officer, Site Supervisor, and Project Manager. |
| **Hydrogen Sulfide** (multi-gas detector or individual $H_2S$ meter) | Breathing zone, continuously during tasks where exposure to hydrogen sulfide is possible | < 5 ppm | Continue work activities. Contact the Site Safety Officer to investigate the potential for contributing factors. |
| | | > 5 ppm | Cease work, exit the area or confined space, and contact the Site Safety Officer, Site Supervisor and Project Manager. |
| **Combustible Gas** (multi-gas meter or individual combustible gas indicator, CGI) | Breathing zone or in the immediate work area continuously during tasks where explosive atmospheres are possible | > 5% of LEL | Cease work, exit, and contact the Site Safety Officer, Site Supervisor, and Project Manager. |
| **Oxygen ($O_2$)** (multi-gas detector or individual $O_2$ meter) | Breathing zone, continuously during tasks were oxygen enriched or deficient atmospheres are possible | < 19.5 % $O_2$ | Cease work deficient atmosphere), exit the area or confined space, and contact the Site Safety Officer, Site Supervisor, and Project Manager. |
| | | > 23.5 % $O_2$ | Cease work enriched atmosphere), exit the area or confined space, and contact the Site Safety Officer, Site Supervisor, and Project Manager. |
| **Carbon Monoxide (CO)** (multi-gas detector or individual CO meter) | Breathing zone, continuously during tasks where exposure to CO is possible | < 10 ppm | Continue work in Level D and continue monitoring |
| | | > 10 ppm | Cease work, exit the area or confined space, and contact the Site Safety Officer, Site Supervisor, and Project Manager. |
| **Dust not otherwise classified** (total by aerosol monitor) | Breathing zone every 30 minutes during field activities where exposure to excessive dusts are possible | < 5 mg/m$^3$ | Continue work in Level D and continue monitoring |
| | | > 5 mg/m$^3$ | Upgrade to Level C (P100 respirator cartridges), implement dust suppression measures; contact the Site Safety Officer & Site Supervisor. |
| | | > 10 mg/m$^3$ | Cease activities, implement more effective dust suppression measures; contact the Site Safety Officer & Site Supervisor. |
| **Dust not otherwise classified** (total by aerosol monitor) | Edge of Exclusion Zone, every 30 minutes during excavation activities | < 5 mg/m$^3$ | Continue work in required PPE, monitor air, and implement engineering controls |
| | | > 5 mg/m$^3$ | Cease activities and contact the Site Safety Officer & Site Supervisor. |

# 10. PERSONAL PROTECTIVE EQUIPMENT

PPE is considered the last line of defense in hazard control. PPE is meant to protect workers when all other methods (elimination, substitution, engineering, and administrative) have been exhausted. All employees must be trained in the proper use and maintenance of PPE. See Procedure S3AM-208-PR, Personal Protective Equipment.

A PPE assessment (see S3AM-208-FM1) can be performed to help determine PPE requirements. PPE upgrades for individual tasks or steps of a task are to be identified in the appropriate THA(s).

## 10.1 Site Minimum Personal Protective Equipment

Unless otherwise excluded by an approved Management of Change (MoC), the following personal protective equipment is required by AECOM and/or client procedures and requirements and shall be worn on site outside of designated "Safe Zones", such as offices and parking lots. Do **NOT** downgrade the PPE specified in the THA and/or this HASP without review and approval from SH&E Manager.

**Site Minimum PPE** [1]

| | |
|---|---|
| ✓ Hard hat | ✓ Safety-toe work boots |
| ✓ Safety glasses with side shields (may be clear or shaded) | ✓ Long pants |
| ✓ Reflective Vest | ✓ Shirt with sleeves (short or long – cover shoulders) |

## 10.2 Additional Personal Protective Equipment Needed on Site

The following PPE is required by the host facility, task hazard assessment (THA), or prescribed upgrades in response to air monitoring response (action) levels.

| **Head / Ears** ***(select all that apply)*** | |
|---|---|
| ☐ Climbing helmet | ☒ Earplugs |
| ☐ Hard hat with chin strap | ☐ Over-ear hearing protection (i.e., muffs) |
| ☐ Wide brimmed hard hat | ☐ Dual hearing protection (earplugs **and** muffs) |
| ☐ Insect net | ☐ Other: [specify] |

| **Face / Eyes** ***(select all that apply)*** | |
|---|---|
| ☐ Spoggles (Safety glasses with foam liner for dust protection) | ☐ Face shield (impact) |
| ☐ Chemical goggles | ☐ Face shield (splash) |
| ☐ Welding mask/goggles | ☐ Other: [specify] |

[1] All PPE must meet applicable ANSI, ASTM, or MSHA standards as applicable.

## Hands *(select all that apply)*

| | |
|---|---|
| ☐ Abrasion, cut and/or puncture resistant | ☐ Chemical resistant: |
| ☐ Impact resistant | ☒ Nitrile |
| ☐ Leather | ☐ PVC |
| ☐ Mechanics | ☐ Rubber/Latex |
| ☐ Other: [specify] | ☐ Other: [specify] |

## Legs / Feet *(select all that apply)*

| | |
|---|---|
| ☐ High ankle boots | ☐ Rubber boots |
| ☐ Metatarsal guards | ☐ Waders |
| ☐ Electrically resistant boots | ☐ Snake gaiters **or** chaps |
| ☐ Puncture-resistant boots or insoles | ☐ Disposable boot covers **or** booties |
| ☐ Other: [specify] | |

## Body *(select all that apply)*

| | |
|---|---|
| ☒ Sunscreen | ☐ Personal flotation device (PFD): |
| ☐ Insect repellent with DEET | ☐ Type I ☐ Type II ☐ Type III |
| ☐ Permethrin applied to clothing | ☐ Type V – Auto-inflate with Type II performance |
| ☐ Disposable coveralls | ☐ Type V – Mustang Suit |
| ☐ Flame Retardant Clothing (FRC): | ☐ Fall Protection: |
| ☐ Rating: [specify] | ☐ Full body harness |
| ☐ Weight: [specify] | ☐ Single lanyard with self-locking D-ring |
| ☐ Rating and weight not specified by client or facility | ☐ Double lanyard with self-locking D-rings |
| ☐ High-visibility clothing: | ☐ Self-retracting lifeline with self-locking D-ring |
| ☐ ANSI Class II | ☐ Shock absorber |
| ☐ ANSI Class III | ☐ Lad-safe or similar device |
| ☐ Not specified by client or facility | ☐ Suspension trauma straps |
| ☐ Other: [specify] | ☐ Self-rescue kit |
| ☐ Other: [specify] | ☐ Other: [specify] |

## Respiratory Protection *(select all that apply)*

| | | | |
|---|---|---|---|
| ☐ Air-Purifying Respirator (APR): | ☐ Filtering Facepiece Respirator (FFR) - **Required Use** | | |
| ☐ Full-Face | ☐ N95 | ☐ N99 | ☐ N100 |
| ☐ Half-Face | ☐ R95 | ☐ R99 | ☐ R100 |
| ☐ Cartridge: [Specify] | ☐ P95 | ☐ P99 | ☐ P100 |
| ☐ Supplied Air Respirator: | ☐ Other: [Specify] | | |
| ☐ Self-Contained Breathing Apparatus (SCBA) | ☒ **FFR / Face Covering / Face Mask** – **Voluntary Use** | | |
| ☐ Air-Line Respirator | | | |

**Equipment** ***(select all that apply)***

| | |
|---|---|
| ☐ Air and Noise Monitoring | ☐ Weather, Heat and Cold Stress Monitoring: |
| ☐ Dosimeter | ☐ Portable weather station **or** meter |
| ☐ See Section 9.1 above | ☒ Smart phone with weather app |
| ☐ Other: [specify] | ☐ Wet Bulb Globe Thermometer (WBGT) |
| ☐ Communication Beyond Cell Phones | ☐ Other: [specify] |
| ☐ Portable, hand-held radio | ☐ Wildlife / Wilderness Survival: |
| ☐ Satellite phone | ☐ Air horn |
| ☐ Other: [specify] | ☐ Bear spray |
| ☐ Traffic / Work Area Controls: | ☐ Emergency Rations |
| ☐ See Section 11.1 below | ☐ Emergency Shelter(s) |
| ☐ Other: [specify] | ☐ Other: [specify] |
| ☒ Fire Control / Protection: | ☐ Other: |
| ☒ minimum 10lb ABC, Qty = 1 | ☐ [specify] |
| ☐ [specify type], Qty = [#] | ☐ [specify] |
| ☐ [specify] | ☐ [specify] |
| ☒ First Aid Kit(s): | ☐ [specify] |
| ☒ Type III, Class A, Qty= 1 | ☐ [specify] |
| ☐ Type [?], Class [?], Qty= [#] | ☐ [specify] |

# 11. SITE CONTROL

The purpose of site control is to protect the public from inadvertently coming into contact with site hazards and to protect AECOM employees being impacted by hazards. This section details the equipment and actions needed to promote optimal site control.

## 11.1 Site Work Zones

Site layout and site control need to be coordinated to achieve a productive work environment and efficient work process while minimizing exposure of employees and the public to hazards associated with the work. Consider the following items when planning the site layout and controls:

- "Line of Fire" hazards- overhead utilities, falling/ tipping equipment, release of energy/ pressure, flying debris
- Noise, dust, odor suppression
- Contamination containment and decontamination area layout
- Traffic control for site vehicles/ equipment (public traffic control requires Traffic Control Plan)
- Restricted access for areas requiring special training, skills, or certifications
- Restriction of work near railroads
- Presence or creation of excavations
- Loading/unloading areas
- Portable restrooms
- Dumpsters and bins
- Equipment lay down
- Heavy equipment parking
- Overnight safety and security needs



Check the description of the site controls **already** in place:

| |
|---|
| ☐ Work area is within a facility/property with secure and restricted access provided by client or third party |
| ☐ Work area is enclosed within a facility/property, but access is not restricted via locks, guards, or gates |
| ☒ Work area is on a property that is open, but access by the public is unlikely |
| ☐ Work area is on a property that is open and access by the public is likely |
| ☐ Work area is in a roadway or right of way of a roadway (Traffic Control Plan required S3AM-306-PR) |
| ☐ Work area is on or near railroad, including right of way, active lines and crossings |
| ☐ Other: [Insert description] |

Check and describe the site controls that need to be added to protect the public and the AECOM work team.

| Control Item | | Description of Type and Application |
|---|---|---|
| ☐ | Fence | |
| ☐ | Locks | |
| ☐ | Barricades | |
| ☐ | Cones | |
| ☐ | Tape | |
| ☒ | Hole Covers | Any uncompleted borings will be covered at the end of the work day with a steel plate. |
| ☐ | Other: | |

## 11.2 Simultaneous and Neighboring Operations

Simultaneous and neighboring operations often present a need for added coordination and communication to address hazards that are presented by multiple operations.

**Simultaneous Operations – Within the Site**

**☐ Yes, see table below for details**
**☒ None, not applicable**

| Activity | Company | Contact Person (Activity Lead) | Contact's Phone Number | Addressed in THA(s) | |
|---|---|---|---|---|---|
| | | | | ☐ Yes | ☐ No |
| | | | | ☐ Yes | ☐ No |
| | | | | ☐ Yes | ☐ No |

**Simultaneous Operations – Neighboring Sites**

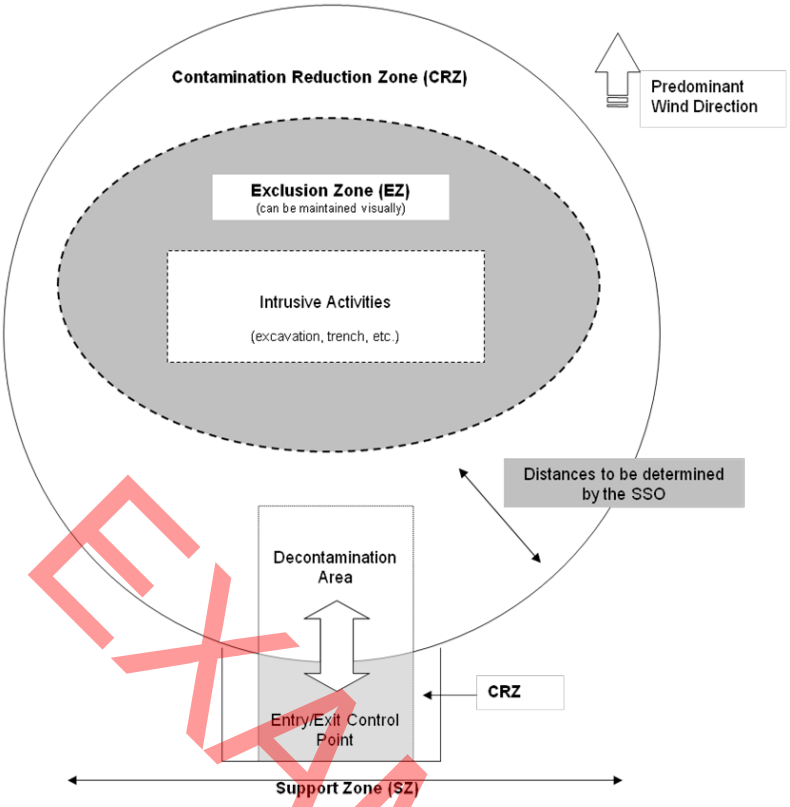
**☐ Yes, see table below for details**
**☒ None, not applicable**

| Activity | Company | Contact Person (Activity Lead) | Contact's Phone Number | Addressed in THA(s) | |
|---|---|---|---|---|---|
| | | | | ☐ Yes | ☐ No |
| | | | | ☐ Yes | ☐ No |
| | | | | ☐ Yes | ☐ No |

## 11.3 Site Control Map/Diagram

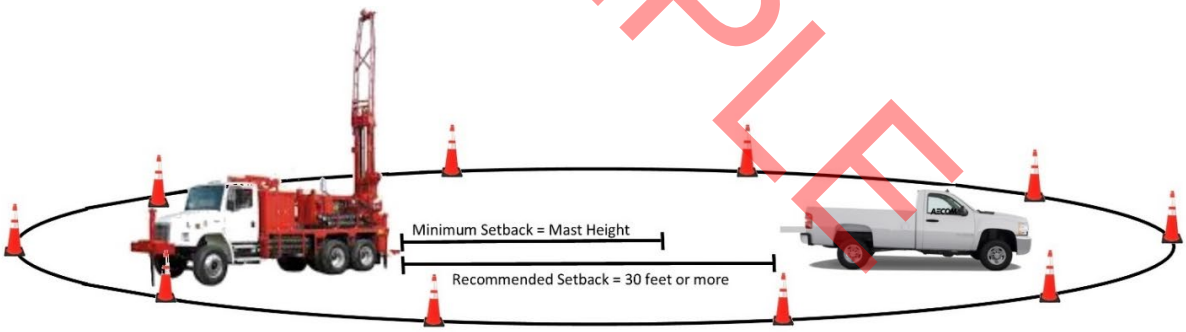
As individual tasks within the scope of work vary in location and scope, a single diagram showing the EZ, CRZ, muster location, etc. is not practical. Such controls will be established on a location by location basis.

### 11.3.1 Example Exclusion Zone Layout






### 11.3.2 Example Work Area Layout for Drilling




## 11.4 Site Security

All projects should be reviewed for the potential for personal security issues (e.g., assault, robbery, threat, etc.).

All facilities maintained by AECOM must maintain an Operational Security Plan (OSP) describing the conditions of the site or facility and identifying basic emergency response procedures. This requirement applies to field trailers maintained by AECOM for use on project sites. A blank OSP template is available in Global Resilience Group Standard GRG-001-RP4. The OSP must be maintained by the Project Manager at the field trailer and a copy provided to the Global Resilience Group, which can be found on Ecosystem.

## 11.5 Client and/or Host Facility-Specific Safety Requirements

The client and/or host facility have specified **no** additional health and safety requirements.

# 12. EMERGENCY RESPONSE

Any situation that has resulted or poses an imminent threat to persons, property and/or the environment constitute an emergency an require immediate action by the individual discovering and/or involved in the situation. Immediate actions start with the signaling of an emergency that is accompanied by a ceasing of site activities (i.e., Stop Work). When safe to do so, immediate actions will be taken to prevent an imminent risk from resulting in an incident and/or minimize the potential for an escalation in the severity of the incident. Immediate actions for reasonably credible emergency situations or scenarios are described within the following sections.

## 12.1 Communication – Method(s) of Signaling an Emergency

In addition to verbal communication amongst the field team, the following methods of communicating or signaling an emergency will be used:

| | | | |
|---|---|---|---|
| ☒ **Cell Phone** | ☐ **Hand Signal** | ☐ **Radio (Channel No. [Insert])** | ☐ **Satellite Phone** |
| ☐ **Host Facility Alarm (specify):** | | | |

## 12.2 Muster and Shelter-in-Place Locations

In the event of an emergency situation or imminent threat persons, property and/or environment, workers will report to the appropriate muster and/or shelter-in-place location. Workers will remain at the muster or shelter-in-place location until a headcount is completed and any "all clear" is issued by the proper authority for the site, unless it is unsafe to remain at that location.

| | |
|---|---|
| **Primary Muster Location:** | Entrance to the site (along Water Street) |
| **Secondary Muster Location:** | Former location of the site trailers located on the North side of Water Street across the street from the site. |
| **Shelter-in-Place Location:** | Vehicles |

## 12.3 Location of Emergency Equipment

Site personnel will be made aware of the location of emergency equipment that can aid in the response to an emergency situation or imminent threat to persons, property and/or the environment during the site orientation, daily toolbox safety meetings, and/or crew reviews.

| Item(s) | Item Description | Location(s) |
|---|---|---|
| First Aid Kit(s) | Type III, Class A | • Field Vehicle |

| Item(s) | Item Description | Location(s) |
|---|---|---|
| Automated External Defibrillator(s) | Standard AED | • N/A |
| Fire Extinguisher(s) | Minimum 10lb ABC | • Drill rig |
| Spill Kit(s) | [Insert Size] | • Drill rig |

## 12.4 Emergency Responders and Resources

In the event of a **life-threatening or critical emergency**, AECOM employees should immediately engage emergency responders and/or resources, as appropriate, to the type of emergency. Steps should be taken to meet and escort emergency responders and/or resources to location of the emergency whenever possible.

**Emergency Responders**

| | | | |
|---|---|---|---|
| Site Resource(s): | Not Applicable | | N/A |
| Fire: | Village of Penn Yan Fire Department | EMERGENCY:<br>NON-EMERGENCY: | 911<br>315-536-6111 |
| Medical Transport: | Land: Penn Yan Volunteer Ambulance | | 315-536-2714 |
| | Air: | | |
| Police: | Village of Penn Yan Police Department | EMERGENCY:<br>NON-EMERGENCY: | 911<br>315-536-4426 |
| Poison Control: | Update New York Poison Control Center | | 1-800-222-1222 |
| Pollution Emergency: | National Response Center | | 800-424-8802 |
| INFO TRAC: | (AECOM's Account Number: 74984) | | 800-535-5053 |

**Utility and Pipeline Owners (For utility and pipeline related emergencies only)**

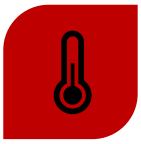
| Utility/Pipeline Name | Provider/Facility Owner | Contact No. |
|---|---|---|
| Electric | New York State Electric and Gas | 800-572-1111 |
| Call Before You Dig | (Utility One-Call Locating) | 811 |



## 12.5 Fitness for Duty and Illness Reporting During the Pandemic

AECOM employees should always live our life-preserving principle of "Fitness for Duty", which requires employees to stay home from work when they are sick, as they are not "Fit for Duty" when ill. During times of pandemic, the importance of this step is increased. If you experience signs/symptoms of illness (see images below) or find out that you have come into contact with a person who has been confirmed positive with the Coronavirus, notify the site supervisor and the project manager, your Area, Regional, or Business Line SH&E Manager, and go home and/or stay home. Notify the AECOM Incident Reporting Hotline (**1-800-348-5046)** and/or the AECOM Nurse Line (**1-512-**

**419-5016).** Managers will work with the local SH&E and/or Resiliency teams to respond according to the AECOM Pandemic Procedure: SR1-003-PR2.

| | | | |
|---|---|---|---|
|  FEVER |  TIREDNESS, CONFUSION |  DRY COUGH |  SHORTNESS OF BREATH |
|  NASAL CONGESTION, SORE THROAT OR RUNNY NOSE |  BLUE LIPS OR FACE |  PERSISENT PAIN OR PRESSURE IN THE CHEST |  IF ANY OF THESE SYMPTOMS ARE IDENTIFIED, SEEK MEDICAL ATTENTION! |

# 13. NOTIFICATIONS AND REPORTING

**NOTE! In the event of a life threatening emergency, call 911 FIRST. A life threatening emergency can include:**

- Loss of consciousness
- Seizures
- Uncontrolled loss of blood
- Heat Stroke
- Head or spinal cord injury
- Severe allergic reaction
- Abdominal trauma
- Difficulty breathing
- Cardiac arrest
- Broken bones

**Once immediate actions have been taken, if safe to do so, notifications (verbal) and reporting (written) must be immediately completed. Notifications serve to engage additional resources in the management of the emergency and initiate additional processes such as medical case management, spill response, incident investigation, etc. Reporting initiates the formal documentation process and supports the development of key learnings to prevent a reoccurrence.**



## 13.1 Initial Notifications

The person observing and/or involved with the emergency or incident is required to make the following initial notifications as soon as reasonably possible:

**Call #1 – AECOM Site Supervisor or Site Safety Officer**

| Role | Person Assigned to Role | Contact No. Primary | Contact No. Alt. |
|---|---|---|---|
| **Primary Site Supervisor:** | Marleiah O'Neill | M 315-569-4616 | |
| **If unavailable, Alternate Site Supervisor:** | Keith Stahle | M 607-398-4284 | |
| **If unavailable, Site Safety Officer:** | Marleiah O'Neill | M 315-569-4616 | |
| Note: D = Direct Office Phone; M = Mobile Phone, O = Office Phone, R = Radio, and S = Satellite Phone | | | |

**Call #2 – DCS Americas Incident Reporting Hotline**

**1-800-348-5046**

| | |
|---|---|
| DIRECT TOLL-FREE | Hours of Operation: 24 Hours/Day; 7 Days/Week |

*For injuries and illnesses, you should be transferred by the hotline to the AECOM Occupational Nurse:*

**AECOM Occupational Nurse**

**1-512-419-5016**

| | |
|---|---|
| DIRECT | Hours of Operation: 24 Hours/Day; 7 Days/Week |

**Call #3 – Affected Employee's Direct Supervisor**

**Employees are encouraged to program their direct supervisor's phone numbers into their cell phone.**

**Call #4 – Vehicle Management or Insurance Provider *(Vehicle Motor Vehicle Accidents Only)***

**Employees involved in motor vehicle accidents or who have discovered property damage caused to motor vehicles should call the appropriate party:**

**ARI Fleet Management *(Fleet vehicles only)***

**1-800-422-7647**

DIRECT TOLL-FREE | Hours of Operation: 24 Hours/Day; 7 Days/Week

**Rental Company** *(Rental vehicles only)*

**Refer to your rental agreement for contact numbers and hours of operation**

**Personal Insurance Provider** *(Personal vehicles used for business travel only)*

**Refer to your personal insurance policy for contact numbers and hours of operation**



## 13.2 Additional Internal AECOM Notifications

The AECOM Site Supervisor will make the following additional internal notifications. If the AECOM Site Supervisor cannot be reached or is not capable of making the notifications, the notifications will be made by an alternate AECOM Site Supervisor or AECOM Site Safety Officer.

### 13.2.1 AECOM Project Management

| Role | Person Assigned to Role | Contact No. Primary | Contact No. Alt. |
|---|---|---|---|
| **AECOM Project Manager:** | Tamara Raby | M 716-870-3446 | D |
| **If unavailable, AECOM Project Mgr. Alternate:** | Matthew Thorpe | M 518-428-4383 | |
| Note: D = Direct Office Phone; M = Mobile Phone, O = Office Phone, R = Radio, and S = Satellite Phone | | | |

The Project Manager will perform any additional internal notification requirements based on the requirements of their region, business line, or client account.

### 13.2.2 AECOM Safety, Health and Environment (SH&E) Management

| Role | Person Assigned to Role | Contact No. Primary | Contact No. Alt. |
|---|---|---|---|
| **Client Acct. SH&E Mgr.:** | N/A | | |
| **Area SH&E Manager:** | Pete Wray | M 302-660-9178 | D 302-318-2880 |

| Role | Person Assigned to Role | Contact No. Primary | Contact No. Alt. |
|---|---|---|---|
| **If unavailable, Regional SH&E Manager:** | Peter Gregory | M 201-602-3511 | D 973-883-8683 |
| Note: D = Direct Office Phone; M = Mobile Phone, O = Office Phone, R = Radio, and S = Satellite Phone | | | |

## 13.3 Subcontractor and/or Third-Party Contacts

The following subcontractor(s) and/or third parties are involved with field activities at the site under a contractual relationship with AECOM, a contractual relationship with an AECOM subcontractor, or as part of a separate, but collaborative effort on behalf of the client.

For emergencies affecting subcontractors and/or third-parties, the AECOM Site Supervisor, or PM for projects without full-time AECOM presence, should ensure that Subcontractor personnel follow their own internal incident reporting processes.

### 13.3.1 Nothnagle Drilling

**Select One:** ☒ **AECOM SUB** ☐ **SUB OF AECOM SUB** ☐ **CLIENT DIRECT HIRE SUB** ☐ **THIRD PARTY**

| Role | Person Assigned to Role | Contact No. Primary | Contact No. Alt. |
|---|---|---|---|
| **Primary Contact Person:** | Stephen DiLaura | M 585-538-2328 | |
| **If unavailable, Alternate Contact Person #1:** | TBD in Field | | |
| **If unavailable, Alternate Contact Person #2:** | | | |
| Note: D = Direct Office Phone; M = Mobile Phone, O = Office Phone, R = Radio, and S = Satellite Phone | | | |

## 13.4 Internal Reporting

### 13.4.1 Incident and Near Miss Reporting

All incidents and near misses (i.e., incidents without consequences), regardless of type and perceived severity, must be reported within **IndustrySafe** (AECOM's SH&E Database) within the timeframes listed below:

| Incident Type | IndustrySafe Reporting Timeframe |
|---|---|
| **Significant Incident, including any injury to an AECOM employee or Subcontractor** | Within **4 hours** |
| **All Other Incidents** | Within **24 Hours** |
| **Note: Only the basic facts, who, what, when, where and how, are needed to complete the initial IndustrySafe report. SH&E Managers will assist you in updating the report as additional information becomes available.** | |

Significant incidents include:

- Fatality;

- Amputation;
- Hospitalization for treatment for more than 24 hours (admission);
- Any single event resulting in more than one employee requiring medical treatment or more than one employee being away from work for more than 3 days;
- Any SH&E-related Consent Agreement/Order/Lawsuit or enforcement action seeking more than $10,000 or alleging criminal activity;
- Any spill or release of a hazardous material that is reportable to a regulatory agency;
- Any Notices of Violation resulting from not operating within a regulatory agency permit/license or consent;
- Any incident resulting in property damage expected to exceed $10,000 United States dollars (USD);
- Any security-related incident that could have caused significant harm to an AECOM employee; and/or
- Any near miss event that may have resulted in any of the above consequences, but because of "luck" did not result in harm to persons, property or the environment.

Other incidents include:

- Any injury or illness to an AECOM employee or subcontractor, even if it does not require medical attention, including non-work-related injuries/illnesses that have become significantly aggravated by the work environment;
- An injury to a member of the public or client representative occurring on an AECOM-controlled work site;
- Re-occurring conditions such as back pain or cumulative trauma disorders (e.g., carpal tunnel syndrome);
- Fire, explosion or flash that is not an intended result of a planned event (e.g., remediation process, laboratory procedure);
- Any incident involving company-owned, rented or leased vehicles (including personal vehicles used for company business); and/or
- Any failure to comply with requirements of a regulatory permit issued to AECOM.



### 13.4.2 Safety Observation Reporting

All safety observations must be reported within **IndustrySafe™ or Lifeguard™** (AECOM's SH&E Databases), as dictated by the AECOM Project Manager, in a timely manner. It is recommended that safety observations are reported within 7 to 14 days of the observation.

### 13.4.3 SH&E Database Access

Incidents, near misses, and audits/inspections must be entered into **IndustrySafe™**, which is one of AECOM's SH&E Databases. Safety observations may also be entered into **IndustrySafe™** at the AECOM Project Manager's discretion. **IndustrySafe™** can be accessed via the SH&E Page on Ecosystem when you are in the office or connected to the AECOM network via VPN. IndustrySafe may also be accessed from your smartphone/device, if equipped with a QR Code Reader App, using the QR Code to the right.

↑ Incidents, Near Misses, Audits/Inspections and Safety Observations ↑

Safety observations may also be entered into **Lifeguard™**, which is one of AECOM's SH&E Databases, at the AECOM Project Manager's discretion. **Lifeguard™** can be accessed via the SH&E Page on Ecosystem when you are in the office or connected to the AECOM network via VPN. **Lifeguard™** may also be accessed from your smartphone/device, if equipped with a QR Code Reader App, using the QR Code to the right.

↑ Safety Observations ↑

### 13.4.4 Reporting Assistance

If your field schedule, access to internet, and/or limited cellular phone coverage have the potential to impact timely incident, near miss, and/or safety observation reporting, please contact your AECOM Project Manager and/or SH&E Manager for assistance.

# 14. RESPONSE PLANS: REASONABLE CREDIBLE EMERGENCY SCENARIOS

Based on site history, operations, and setting along with the approved scope of work, the following emergency scenarios have been determined to be reasonably credible to occur. Immediate actions and post-emergency follow-up actions, when applicable, are discussed below for each reasonably credible emergency scenario.

## 14.1 Injuries and Illnesses

### 14.1.1 Immediate Actions

#### 14.1.1.1 Engage Medical Resources

In the event of a **life-threatening or critical emergency**, AECOM employees should **dial 911 or the site-specific number** for the emergency responder and follow the recommended instructions. After dialing 911 or the site-specific number and in **less serious situations**, an injured employee or a co-worker should contact the **Incident Hotline at 1-800-348-5046** to ensure that the employee receives the best care at the best time (i.e., within the first hour following an injury or potential injury). By contacting the Incident Hotline, the worker can be connected with AECOM's nurses for first aid advice. If recommended by the nurse, the supervisor or a co-worker should drive the injured employee to the project-designated clinic or hospital.

#### 14.1.1.2 Care for the Injured or Ill Person(s)

Employees trained in first aid, CPR and/or Automated External Defibrillators (AED) should render initial care in a manner consistent with their training. This care should be provided until the injury or illness is resolved (i.e., first aid cases) or transportation to the appropriate medical facility is arranged and present on the site (i.e., treatment beyond first aid incidents).

**First Aid, CPR and AED Trained Personnel**

| Name | Company | Contact No. | 1st Aid | CPR | AED |
|---|---|---|---|---|---|
| | | | ☐ | ☐ | ☐ |
| | | | ☐ | ☐ | ☐ |
| | | | ☐ | ☐ | ☐ |
| | | | ☐ | ☐ | ☐ |

#### 14.1.1.3 Transport to Nearest Medical Facility for Treatment

For injuries and illnesses that require treatment beyond first aid, the injured/ill person(s) shall be transported to the nearest medical facility for treatment. For life-threatening or critical emergencies, Emergency Medical Services (EMS) should handle the transport. EMS will determine the hospital to which the injured/ill person(s) will be transported. The AECOM Field Supervisor and/or Site Safety Officer shall confirm with EMS the final destination of the injured/ill

persons. The nearest hospital equipped for emergency medical care, driving directions and map are provided in **Attachment A**.

For less serious situations, the AECOM Site Supervisor, AECOM Site Safety Officer (SSO) and/or their designee shall transport and accompany the injured/ill person(s) to the nearest Occupational Clinic (preferred) or hospital, if an occupational clinic is not available, not within a reasonable driving distance, or cannot be reached during their hours of operation. The nearest occupational clinic, driving directions and map are provided in **Attachment A**.

#### 14.1.1.4 Engage AECOM Occupational Nurse with Medical Treatment Provider

The AECOM Site Supervisor, AECOM SSO or their designee who is accompanying the injured/ill person(s) to the medical treatment facility shall notify the AECOM Occupational Nurse of the situation, communicate the destination of the injured/ill person(s) and assist the nurse in connecting with the medical treatment provider to facilitate medical case management.

### 14.1.2 Follow-Up Actions

Outside of notifications and reporting, the AECOM Site Supervisor, AECOM SSO or their designee shall coordinate the post-treatment transportation of injured/ill person(s).

## 14.2 Motor Vehicle Breakdowns and Flat Tires

If safe to do so, remove the car from the traveled way. To the extent possible, AECOM personnel should **NOT** change flat tires or perform similar repairs.

- For rental vehicles, contact the rental company
- For fleet vehicles, contact **ARI Fleet Management**: **1-800-422-7647**
    - **Prompt 1 – Roadside Assistance**
    - **Prompt 3 – Maintenance Management**
- For personal vehicles used on AECOM business, contact an emergency provider.

## 14.3 Motor Vehicle Collisions

All vehicles should be rented through Carson Wagonlit Travel (accessible via Ecosystem) to ensure that AECOM insurance is included in the rental rate. All other insurances should be declined. AECOM's rental vehicle insurance policy for National/Enterprise or Avis can be found on the DCS Americas United States or Canada travel pages. **Drivers MUST print and carry the applicable insurance policy for the rental. For company owned vehicles, drivers MUST also print and carry proof of insurance.**

### 14.3.1 Immediate Actions (Recommended Responses)

- Assess the situation and move all occupants (except the injured) out of further harm's way.
- If safe to do so, remove the car from the traveled way.

- Call 911, if necessary
    - If appropriate, wait for police to arrive before moving vehicles.
- Provide insurance information to other drivers if necessary or requested and collect the same:
    - Driver's Information:
        - Name and contact number
        - Driver's license number, expiration date and issuing state/province
        - Insurance policy number, carrier/provider and provider's contact number
    - Vehicle Information:
        - Make, model and year
        - License plate/tag number and issuing state/province
        - Owner's name, address and contact number
    - Passenger's Information:
        - Name and contact number
    - Witness Information:
        - Name and contact number
- If possible, obtain names and phone numbers of witnesses.
- Sketch the accident scene and/or take photographs of the scene, if possible and **safe to do so**.
- Take photographs of the damage to vehicles and property, if possible and **safe to do so**.
- If police are **NOT** on scene, file an accident report at the local police station.

**NOTE: DO NOT ADMIT LIABILITY, AGREE TO PAY FOR DAMAGE, OR SIGN A DOCUMENT RELATED TO AN INCIDENT EXCEPT AS REQUIRED BY LAW.**



## 14.3.2 Follow-Up Actions

### 14.3.2.1 Police Report

- If the police were **NOT** on scene, file an accident report at the local police station.
- Include a copy of the police report with the IndustrySafe report (upload report to IndustrySafe).

### 14.3.2.2 Drug and Alcohol (D&A) Testing

Driver's that may have caused or contributed to motor vehicle collisions resulting in $2,500 U.S. Dollars (USD) or more in damage to individuals, vehicles and/or property shall undergo drug and alcohol testing. The AECOM Site Supervisor, AECOM SSO or designee shall:

- Contact Lindsay Scammell at **1-804-515-8552** to coordinate the drug and alcohol testing;
- Accompany and transport the driver to and from the D&A testing facility; and

- Coordinate transportation for the driver pending the results of the D&A testing.

## 14.4 Environmental Spills/Releases

AECOM employees are not expected to take action or to participate in rescues or responses to chemical releases (including of petroleum products) beyond the initial discovery of the release and immediate mitigation actions such as closing a valve, placing absorbents, and notifying the client and or public emergency response system (911), unless there is a contractual provision for this response and specially trained employees.

### 14.4.1 Immediate Actions – Reportable Quantity Regulatory Agency Notifications

All environmental spills or releases of hazardous materials (e.g., fuels, solvents, etc.), whether in excess of the Reportable Quantity or not, will be reported according to the incident reporting procedure. In determining whether a spill or release must be reported to a regulatory agency, the Site Supervisor or qualified worker will assess the quantity of the spill or release and evaluate the reporting criteria against the state-specific reporting requirements, applicable regulatory permit, and/or client-specific reporting procedures. **If reporting to a US state or Federal regulatory agency is required, AECOM has 15 minutes from the time of the spill/release to officially report it. In Canada, spills notification varies by Province. Employees should review the local regulatory requirement, document it in this plan and communicate it to all personnel.**

Chemical-specific United States (U.S.) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quantities for the known chemicals onsite are shown in the table below.

| Hazardous Substance | Regulatory Synonyms | Final RQ (lbs.) |
|---|---|---|
| 1,1,1-Trichloroethane | TCA | 1,000 |
| Arsenic | N/A | 1 |
| Benzene | N/A | 10 |
| Cadmium | N/A | 10 |
| Carbon Tetrachloride | N/A | 10 |
| Chromium | N/A | 5,000 |
| Ethyl Benzene | N/A | 1,000 |
| Lead | N/A | 10 |
| Mercury | N/A | 1 |
| Methyl Ethyl Ketone | MEK | 5,000 |
| Nickel | N/A | 100 |
| Pentachlorophenol | PCP | 10 |
| Selenium | N/A | 100 |
| Tetrachloroethylene | Perchloroethylene, PCE | 100 |
| Toluene | N/A | 1,000 |
| Trichloroethylene | Trichloroethene, TCE | 100 |
| Xylene | N/A | 100 |

CERCLA RQ's can be found at: http://www.epa.gov/oem/docs/er/302table01.pdf

The spill containment program addresses the following site-specific information:

- Potential hazardous substance spills and available controls;
- Initial notification and response;
- Spill evaluation and response; and
- Post-spill evaluation.

### 14.4.2 Immediate Actions – Spill Evaluation and Response

The Field Lead/Site Supervisor and/or SSO are responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area is isolated and demarcated to the extent possible. When an incidental release occurs, clean-up personnel receive instructions in a pre-clean-up meeting as to spill conditions, PPE, response activities, decontamination, and waste handling.

The procedures of the Emergency Response section of this HASP are immediately implemented when the spill is determined to require emergency precautions and action, if necessary, to protect those outside the clean-up area, notification of the appropriate authorities is made. The table in Section 14.4.1 lists the spill conditions that trigger notification of Federal, state, and local agencies.

The following are general measures that response/clean-up personnel take when responding to a spill:

- To minimize the potential for a hazardous spill, hazardous substances, control/absorbent media, drums and containers, and other contaminated materials are properly stored and labeled.
- When a spill occurs, only those persons involved in overseeing or performing spill containment operations will be allowed within the designated hazard areas. If necessary, the area will be roped or otherwise blocked off. Unauthorized personnel are kept clear of the spill area.
- Appropriate PPE is donned before entering the spill area.
- Appropriate spill control measures are applied during spill response.
- Whenever possible without endangerment of personnel, the spill is stopped at the source or as close to the source as possible.
- Ignition points are removed if fire or explosion hazards exist.
- Surrounding reactive materials are removed.
- Drains or drainage in the spill area are blocked or surrounded by berms to exclude the spilled waste and any materials applied to it.
- Provisions are made to contain and recover a neutralizing solution, if used.
- Small spills or leaks from a drum, tank or pipe will be evacuate an appropriate distance in all directions to allow clean-up and to prevent employee exposure.
- For small spills, sorbent materials such as sand, sawdust, or commercial sorbents are placed directly on the spill to prevent further spreading and aid in recovery.

- Spill area sprayed with appropriate foam where the possibility of volatile emissions exists.
- If the spill results in the formation of a toxic vapor cloud, from vaporization, reaction with surrounding materials, or the outbreak of fire, further evacuation may be required.
- To dispose of spill waste, all contaminated sorbents, liquid waste, or other spill clean-up will be placed in small quantities in approved drums for proper storage or disposal as hazardous waste. The weight of the drums shall not exceed the chemical-specific weight listed in the table above.

### 14.4.3 Post Spill Evaluation

As part of the incident investigation and reporting documentation, a written spill response report shall be prepared at the conclusion of clean-up operations. The report will include, at a minimum, the following information:

- Date of spill incident;
- Cause of incident;
- Spill response actions;
- Any outside agencies involved, including their incident reports; and
- Lessons learned or suggested improvements.

The spill area is inspected to ensure the area has been satisfactorily cleaned. The use of surface and air sampling is utilized in this determination as necessary. The root cause of the spill shall be examined, and corrective steps taken to ensure the engineering and control measures in place have performed, as required. If alternative precautions or measures are needed, they are made available and implemented.

All durable equipment placed into use during clean-up activities is decontaminated for future utilization. All spill response equipment and supplies are re-stocked as required.

## 14.5 Fire

AECOM employees are not expected to attempt to put out fires. Stop work; notify all AECOM personnel, move upwind and contact 911 and/or emergency response at the site. If employees have been properly trained in the operation of a fire extinguisher, they may attempt to put out a small fire, provided that the following conditions are met:

- The fire must be small (i.e., smaller than a trash can) and in its early stages;
- The employee must have an escape route;
- The employee must be trained and know they have the right type of extinguisher;
- The employee must be safe from toxic gases; and
- There must be no hazardous conditions that could quickly accelerate the fire (i.e., presence of chemicals, especially dry grass, etc.).

Above all, if in doubt, the employee must **NOT** attempt to fight the fire.

## 14.6 Environmental Impacts

AECOM strives to avoid or control environmental impacts from our operations through planning and implementation of best practices as well as preparing responses to react to environmental incidents. Environmental Compliance procedure S3AM-204-PR provides details on permitting and planning requirements.

**Potential Environmental Impacts**

| Type | Description of Hazard and Permit or Control Being Implemented |
|---|---|
| ☐ Air Emissions | |
| ☒ Hazardous Waste Management | All water and soil generated from the work operations will be containerized in labelled containers to be disposed of off site. |
| ☐ Storm Water Pollution | |
| ☐ Wetlands | |
| ☐ Critical Habitat(s) | |
| ☐ Other: | |

AECOM will take the appropriate steps to mitigate environmental impacts by implementing the controls listed above and addressing any spills or fires as outlined in Sections 14.4 and 14.5, respectively.

## 14.7 Inclement Weather

Inclement weather includes but is not limited to heavy rain or storms and associated floods, heavy winds, lightning, snowstorms and blizzards, and sandstorms and haboobs. Weather conditions which are normal or expected can cause hazards, such as cold weather in winter or excessive heat in the summer. The best approach to preventing exposure to these hazards is project planning. Where possible, plan to perform work at seasonably appropriate times of the year. Starting several days to a week prior to field work, begin reviewing projected weather forecasts to determine if work should be delayed, or accelerated, to avoid days with higher chances of inclement weather. Weather conditions can change rapidly. Therefore, field personnel and the project managers should be prepared to utilize Stop Work Authority if uncontrolled hazardous situations develop. Additional precautionary measures for reasonably foreseeable weather conditions are provided below.

### 14.7.1 Ambient Temperature (Heat and Cold)

Heat and cold stress may vary based upon work activities, PPE/clothing selection, geographical locations, and weather conditions. Where possible, plan work to avoid the hottest (or coldest) part of the day. To reduce the potential of developing heat/cold stress, be aware of the signs and symptoms of heat/cold stress and watch fellow employees for signs of heat/cold stress. Use vehicles or covered area for shelter and take breaks as needed.

#### 14.7.1.1 Hot Weather

In hot weather and/or work area conditions, keep hydrated, prevent over exposure to the sun with clothing or use of sun cream and take frequent breaks out of the sun. Use the “buddy system” to monitor effects of heat stress as it can be difficult to identify the impacts of heat in yourself. Create shaded work areas if appropriate. Use a strong

sunscreen and wear a full-brimmed hat when in the sun to protect the back of the neck and shoulders. Refer to SH&E Procedure S3AM-113-PR1, Heat Stress, for more information.

#### 14.7.1.2 Cold Weather

In cold/wet weather and/or work area conditions, be aware of potentially slippery surfaces (wet or icy). Wear boots with good tread and carefully select your walking path to eliminate or reduce the need to traverse wet or icy surfaces. Wear warm / waterproof clothing and take breaks in a warm location. If heavy snows or icy weather are anticipated, consider your driving route prior to leaving for the site or returning at the end of the day. It may be necessary to stop work earlier in the day to allow time to return to lodging if road conditions are at risk of deteriorating. Refer to SH&E Procedure S3AM-112-PR1, Cold Stress, for more information.

### 14.7.2 Storms

Heavy or unexpected storms, whether they be rain, snow, or wind, represent a changed condition in which multiple hazards could be present. Stormy weather increases hazards at the job site by making travel more treacherous, both on foot and in vehicles. Visibility can be reduced. Manual tasks become more difficult as conditions worsen, increasing the chances of injury. Mental states may deteriorate increasing the risks of hazards attributable to frustration or exhaustion. Other hazards may exist; for example, winds could cause objects to blow away or strike workers or equipment or blow dust or debris into eyes. For these reasons, be aware of changing weather conditions and be prepared to stop-work to secure the project site and depart prior to storms whenever possible. If storms suddenly develop, remember that the loss of equipment or materials is far preferable to taking risks of injury by attempting to demobilize when storms are active.

### 14.7.3 Lightning

One of the most serious weather threats is lightning. A two-tier notification system consisting of alerts and stand downs shall be used to allow ample time for field teams to cease their activities, secure the work area, and seek shelter.

#### 14.7.3.1 Immediate Actions – Alerts and Stand Downs

Alerts are issued by AECOM Site Supervisor and/or AECOM Site Safety Office when inclement weather, including lightning is detected within 50 miles (80 km) of the site. Alerts indicate that work crews should be prepared to cease all field activities and secure the work area. Stand Downs are issued by AECOM Site Supervisor and/or AECOM Site Safety Officer when inclement weather is detected within 30 miles (50 km) of the work area. Stand downs indicate that all work crews shall immediately cease all field activities and seek shelter. Stand downs remain in effect until the inclement weather has passed. For thunderstorms, the stand down will remain in effect for a minimum of 30 minutes following the last detection of lightning.

#### 14.7.3.2 Immediate Actions - Guidance for Lightning

**Go Indoors:** Remember the phrase, "**When thunder roars, go indoors**." If you see lightning and cannot count to 30 before hearing thunder, the lightning is too close for comfort. Find a safe, enclosed shelter when you hear thunder. Safe shelters include homes, offices, shopping centers, and hard-top vehicles with the windows rolled up.

**Crouch Close to the Ground and Separate:** If you are caught in an open area, crouch down in a ball-like position (**feet and knees together**) with your head tucked and hands over your ears so that you are down low with minimal contact with the ground. **Do NOT lie down**. Lightning causes electric currents along the top of the ground that can be deadly over 100 feet away. Crouching down is the best combination of being low and touching the ground as little as possible.

**Separate:** If you are in a group during a thunderstorm, separate from each other. This separation will reduce the number of injuries if lightning strikes the ground.

If a person is struck by lightning:

- Call 911 or other Emergency Services Contact.
- Assess the scene to ensure that continuing risk to rescuers does not exist if lightning strikes. For other electrical-related emergencies (non-lightning), ensure the source of electricity has been deenergized.
- Check to see if the victim is breathing and proceed with CPR if victim is not breathing.

# 15. PERSONAL ACKNOWLEDGEMENT AND DISCLAIMER

By signing below, the undersigned acknowledges that he/she has reviewed the AECOM Health and Safety Plan for the **NYSEG Penn Yan Water Street Former MGP** site. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work and will comply with the provisions contained therein. The employee understands that they are **NOT** to perform any work that they have not been adequately trained for and that they are to stop work if it is unsafe to proceed. Finally, the employee understands to notify the Site Supervisor and the **Incident Hotline at 800-348-5046** for any incident, ***including ANY injury even if no first aid or medical treatment is required.***

| Print Name | Signature | Organization | Date |
|---|---|---|---|
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## 15.1 Disclaimer

This HASP, and each of its provisions, is applicable only to, and for use only by, AECOM, its affiliates, and its subcontractors. Any use of this Plan by other parties, including, without limitation, third-party contractors on industrial sites or projects where AECOM is providing engineering, construction management, or similar services, without the express written permission of AECOM, will be at that party's sole risk, and AECOM Corporation shall have no responsibility. The existence and use of this Plan by AECOM shall not be deemed an admission or evidence of any acceptance of any safety responsibility by AECOM for other parties unless such responsibility is expressly assumed in writing by AECOM in a specific project contract.

AECOM Imagine it. Delivered.

# ATTACHMENT A

## Hospital and Clinic Directions/Maps

## Incident Reporting and Response Flow Chart

# A-1: NEAREST HOSPITAL

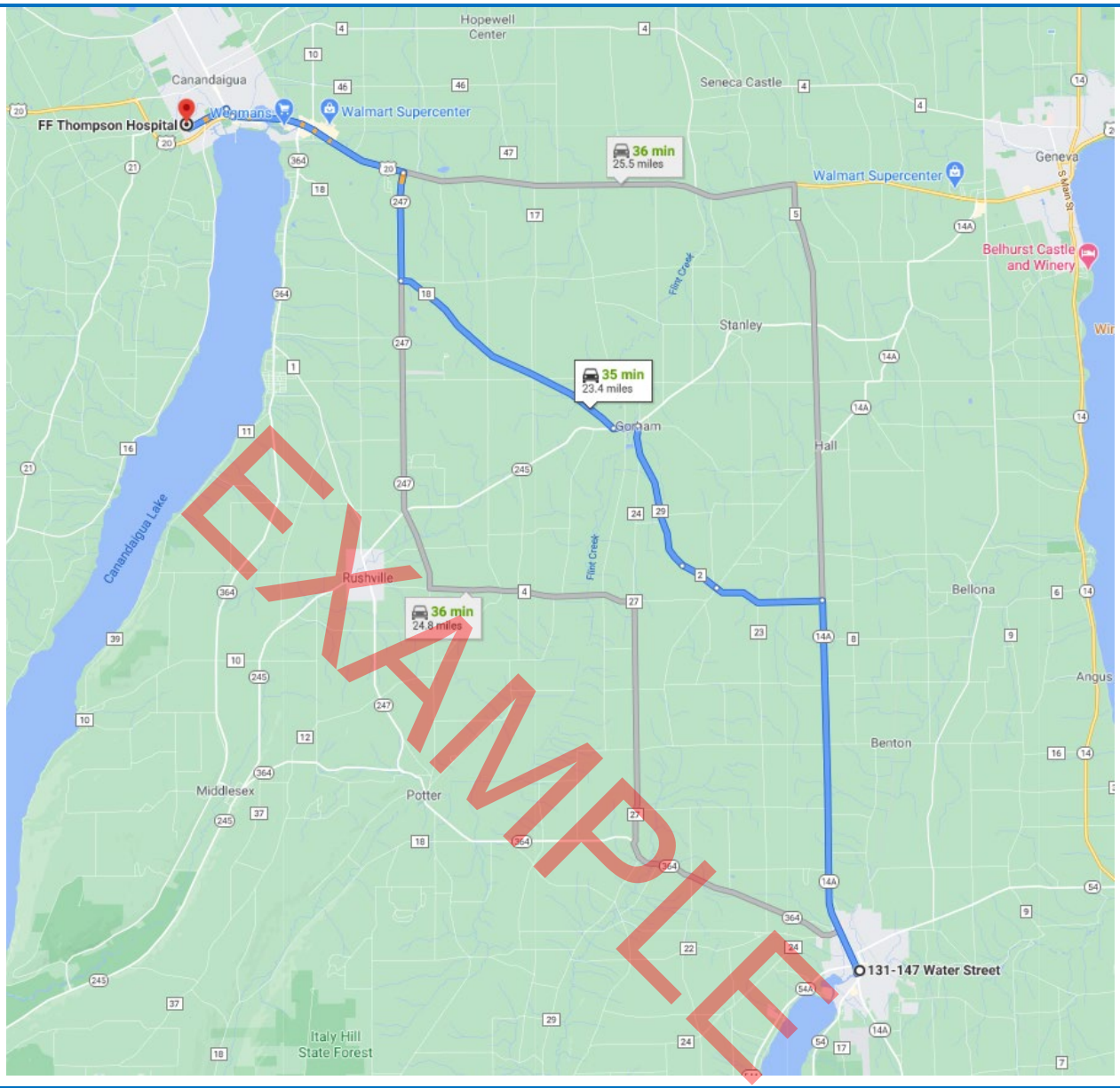
## F.F. Thompson Hospital ..... 1-585-396-6000

| | | | |
|---|---|---|---|
| **Address:** | 350 Parrish St. | | |
| **City:** | Canandaigua | | |
| **State/Province:** | NY | **Postal/Zip Code:** | 14424 |
| **Estimated Travel Time:** | 35 Minutes | **Distance:** | 23.5 Miles |

### DRIVING DIRECTIONS

- From Site, Turn LEFT onto Water Street and head toward Liberty Street (400 ft)
- Turn RIGHT onto NY-14A N/Liberty Street (6.7 mi.)
- Turn LEFT onto Ferguson Corners Rd (2 mi)
- Continue onto County Rd 2 (0.7 mi)
- Continue onto County Rd 29 (2.7 mi)
- Turn LEFT onto NY-245 S (0.4 mi)
- Turn RIGHT onto County Rd 18 (4.7 mi)
- Turn RIGHT onto NY-247 N (1.9 mi)
- Turn LEFT onto US-20 W (3.3 mi)
- Turn RIGHT onto S Main St (0.2 mi)
- Turn LEFT onto Parrish St (0.7 mi)
- Turn RIGHT (223 ft)
- Turn RIGHT (164 ft)
- Arrive at Hospital on the RIGHT

### MAP TO HOSPITAL



# A-2: NEAREST OCCUPATIONAL CLINIC

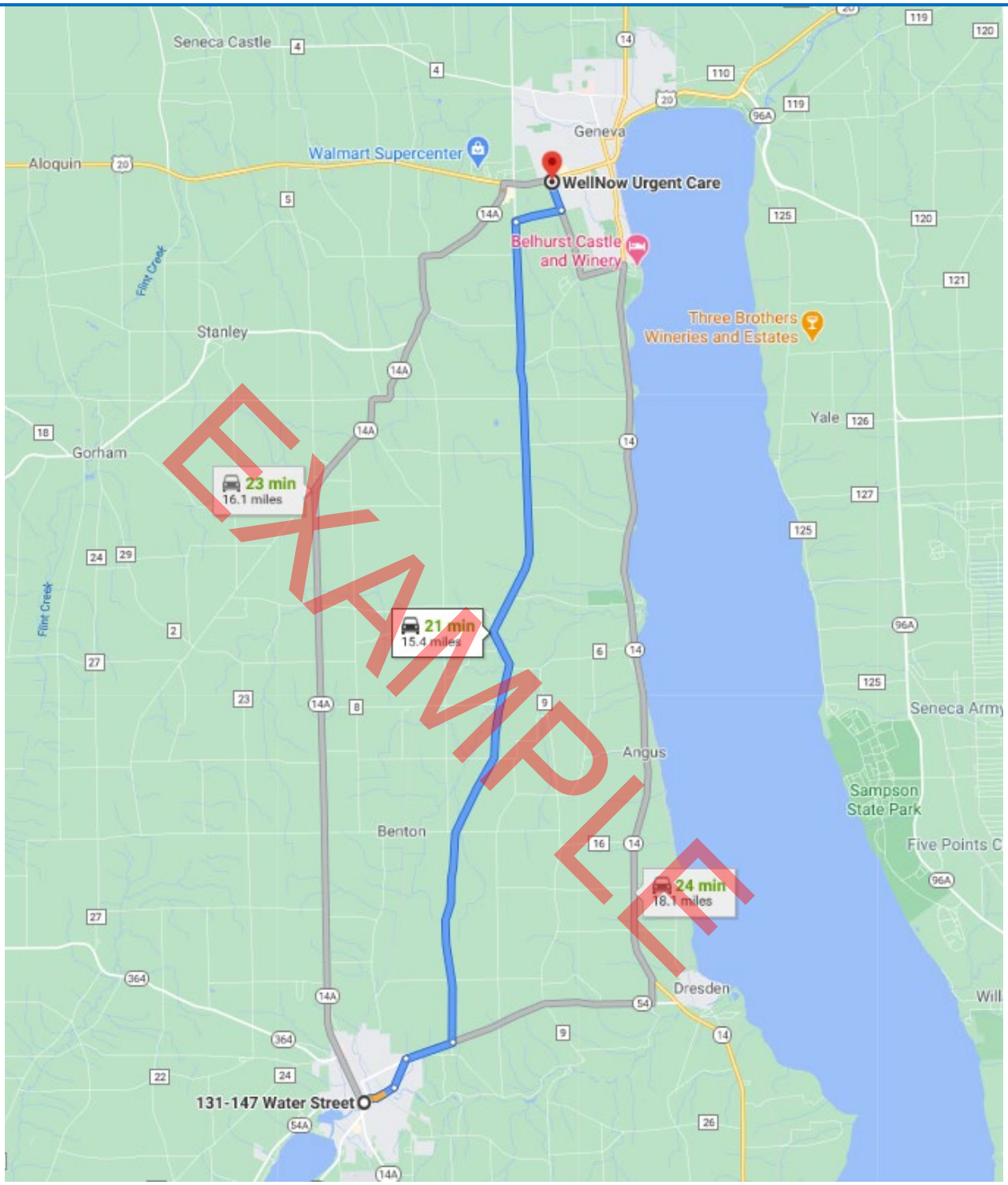
**Wellnow Urgent Care .....1-315-230-4074**

| | | | |
|---|---|---|---|
| **Address:** | 1 White Springs Rd | | |
| **City:** | Geneva | | |
| **State/Province:** | NY | **Postal/Zip Code:** | 14456 |
| **Estimated Travel Time:** | 21 Minutes | **Distance:** | 15.4 Miles |
| **Business Hours:** | 8AM – 8PM | | |

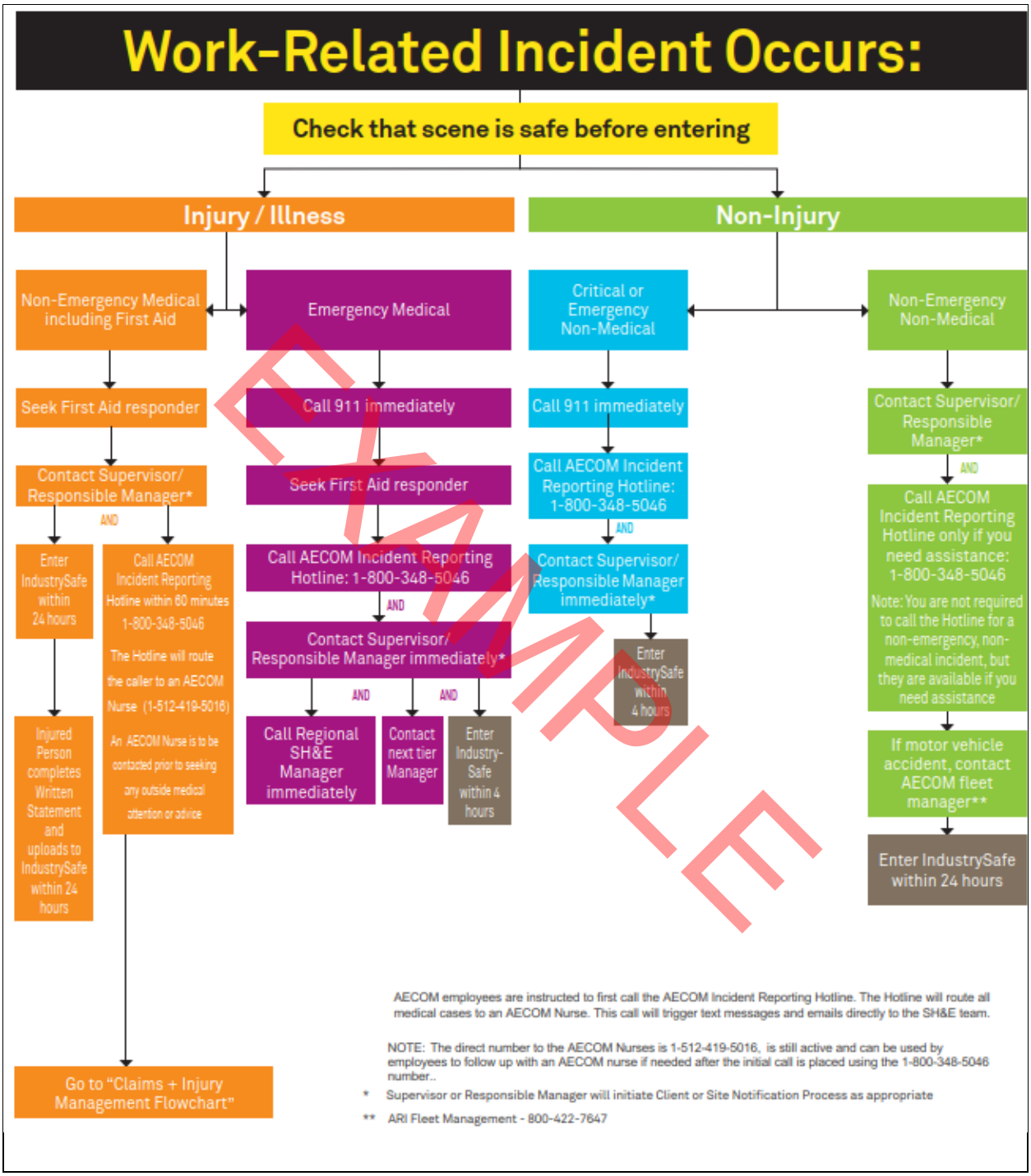
## DRIVING DIRECTIONS

- From Site, Turn RIGHT onto Water St and toward Main St (463 ft)
- Continue onto Seneca St (0.4 mi)
- Continue onto Walnut St (0.5 mi)
- Turn RIGHT onto NY-54 E/Clinton St (0.7 mi)
- Turn LEFT onto Pre-Emption Rd (12.6 mi)
- Turn RIGHT onto White Springs Ln (0.7 mi)
- Turn LEFT onto White Springs Rd (0.4 mi)
- Turn RIGHT (112 ft)
- Turn LEFT (174 ft)
- Arrive at Hospital on the RIGHT

## MAP TO OCCUPATIONAL CLINIC



# A-3: INCIDENT REPORTING AND RESPONSE FLOW CHART



# ATTACHMENT B

## Task Hazard Assessment (THA) and Tailgate Meeting Forms



Each discrete task being performed during the project (i.e., Driving, Inspection, Sample Collection, etc.) requires a Task Hazard Assessment (THA; form S4[DCS]AM-209-FM6-A). If you don't have a THA for a task, obtain or develop one. The DCS Americas Templated THA Library may also be used to find previously approved THAs.

The THAs MUST be reviewed at the start of each shift and signed by all staff involved in the operation. The THAs should be consulted and updated throughout the day if conditions change using the 'On-Site Edits' lines.

Insert Task Hazard Analyses here. Include these documents after this cover sheet in the final HASP.

The preparer shall download a sufficient number of blank copies of the Tailgate Meeting Form (S3AM-209-FM5) to use each day of fieldwork, and blank THA forms so that new task can be performed, if not covered by previously-prepared THAs. A THA must be in hand prior to starting to perform work on any task.

# B-1: TASK HAZARD ASSESSMENT INSTRUCTIONS

Each unique task or work group should have their own THAs. If workers have a THA for their task(s) in hand, they should simply review it and document the site-specific edits in red pen in the appropriate section. If workers do ***NOT*** have a THA for all tasks to be performed, a THA must be obtained or drafted *prior to starting work* on that task. Use additional pages as needed.

- Identify the basic steps of the task that must be performed in order and their associated hazards. Identify controls or barriers to mitigate each identified hazard.
- Clearly identify any **STOP WORK** triggers
- Document stop work and change management if conditions/ scope changes.
- Use 4-Sight to identify and mitigate site-specific hazards throughout the day. Modify the THA as needed. Contact site supervisors or the PM for any significant scope changes or changes of expected conditions.
- All THAs shall be 3 pages (maximum) or less (preferred). If they are longer, the task is too broad.
- All hazards will use standardized nomenclature (Hazard Wheel), should be specific, detail how someone could be hurt, and what the outcome could be.
- All actions to mitigate hazards must be specific, clearly aligned with its respective hazard and not generic. Avoid words such as "*proper*", "*correct*", or "*appropriate*"). Use specifics and numerical values (i.e., wear disposable nitrile gloves, stand back 6 feet/1.8 meters, take a 10 minute break every hour).
- PPE cannot be the only line of defense - PPE is always the last line of defense, so think through what other controls (engineering, administrative, etc.) could mitigate hazards.



**Discuss as Applicable and Modify THA as Needed**

| Note: Check ☐ if reviewed or mark N/A | | |
|---|---|---|
| 1 | Biological, Chemical, Electrical, and Physical Hazards | ☐ Reviewed ☐ N/A |
| 2 | Decontamination Procedures | ☐ Reviewed ☐ N/A |
| 3 | Ergonomics- Lifting, Body Position | ☐ Reviewed ☐ N/A |
| 4 | Lock Out/ Tag Out | ☐ Reviewed ☐ N/A |
| 5 | Short Service Employees- visual identifier and mentor/ oversight assignment | ☐ Reviewed ☐ N/A |
| 6 | Simultaneous/ Neighboring Operations | ☐ Reviewed ☐ N/A |
| 7 | Slip/ Trip/ Fall Hazards | ☐ Reviewed ☐ N/A |
| 8 | Specialized PPE Needs | ☐ Reviewed ☐ N/A |
| 9 | Traffic Control | ☐ Reviewed ☐ N/A |
| 10 | Waste Management/ Decontamination | ☐ Reviewed ☐ N/A |
| 11 | Weather Hazards/ Heat Stress/ Cold Stress | ☐ Reviewed ☐ N/A |
| 12 | Changes in Personnel, Equipment/Machinery, Methods and Materials | ☐ Reviewed ☐ N/A |
| 13 | Work Permit requirements (identify): | ☐ Reviewed ☐ N/A |
| 14 | Other (describe): | ☐ Reviewed ☐ N/A |

# B-1: TASK HAZARD ASSESSMENT INSTRUCTIONS (Continued)

**Using the Matrix:**

1. Identify basic steps of the task and associated hazards.
2. Calculate the initial risk rating.
3. Identify control measure to eliminate or reduce the hazard's risk and calculate the residual risk rating.
4. If the risk rating (after controls are implemented) cannot be reduced to 4 or lower, additional approvals are needed before the activity can begin.

| Severity – Potential Consequences | | | | |
|---|---|---|---|---|
| | **People** | **Property Damage** | **Environmental Impact** | **Public Image/Reputation** |
| Catastrophic | Fatality, Multiple Major Incidents | >$1M USD, Structural collapse | Offsite impact requiring remediation | Government intervention |
| Critical | Permanent impairment, Long term injury/illness | >$250K to $1M USD | Onsite impact requiring remediation | Media intervention |
| Major | Lost/Restricted Work | > $10K to $250K USD | Release at/above reportable limit | Owner intervention |
| Moderate | Medical Treatment | > $1K to $10K USD | Release below reportable limit | Community or local attention |
| Minor | First Aid | </=$1K USD | Small chemical release contained onsite | Individual complaint |

| Probability | | |
|---|---|---|
| Frequent | Expected to occur during task/activity | 9/10 |
| Probable | Likely to occur during task/activity | 1/10 |
| Occasional | May occur during the task/activity | 1/100 |
| Remote | Unlikely to occur during task/activity | 1/1,000 |
| Improbable | Highly unlikely to occur, but possible during task/activity | 1/10,000 |

| **Probability** | **Severity** | | | | |
|---|---|---|---|---|---|
| | 5 - Catastrophic | 4 – Critical | 3 – Major | 2 – Moderate | 1 - Minor |
| 5 – Frequent | 25 | 20 | 15 | 10 | 5 |
| 4 – Probable | 20 | 16 | 12 | 8 | 4 |
| 3 – Occasional | 15 | 12 | 9 | 6 | 3 |
| 2 – Remote | 10 | 8 | 6 | 4 | 2 |
| 1 - Improbable | 5 | 4 | 3 | 2 | 1 |

| Risk Rating (Probability x Severity) | Risk Acceptance Authority |
|---|---|
| 1 to 4 (Low) | Risk is tolerable, manage at local level |
| 5 to 9 (Medium) | Risk requires approval by Operations Lead/Supervisor & Safety Manager |
| 10 to 25 (High) | Risk requires the approval of the Operations Manager & Safety Director |

# B-2: PROJECT TASK HAZARD ASSESSMENTS (THAs)

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| **Task Name:** | Field and Field Office – Precautions for Coronavirus | **Control #:** | Rev # 6 (6/17/2020) |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Penn Yan Water Street Former MGP | Client: | NYSEG | **Date:** | 12/28/20 |
| **Permits Required? (list):** | Essential Services Letter required for travel if required by ocal ordinance | **Work Location:** | Penn Yan, NY | | |

**THIS THA MUST BE FULLY REVIEWED AND ACKNOWLEDGED DAILY BY ALL AECOM STAFF and AECOM SUBS ON-SITE**

**All job steps, hazards, work practices & PPE are to be clearly understood and implemented. All necessary revisions have been written on the THA.**

| | |
|---|---|
| **Required PPE:** | ☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☐ Gloves: ☐ Hearing Protection ☐ Other: _____ |
| | For certain tasks (see THA below) the following are required:<br>Potable water and soap (preferable) or hand sanitizer w/ 60% alcohol<br>Disinfectant wipes<br>Tissues<br>Nitrile gloves<br>Safety goggles<br>Coveralls<br>Disinfectant spray List of Cleaning Products to Kill Coronavirus<br><br>Face covering when you are not able to maintain 6' social distance or where required by client or government order. Face coverings can be made from household materials by using needles, thread, cloth, tee-shirts, bandanas, etc. KN95, N95, dust/face masks are also acceptable. Local requirements may vary. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html<br><br>PPE Note: Consider checking sources such as gas stations and specialty markets, as these may have equipment or materials not available at general grocery stores. |
| **Tools & Equipment:** | |



**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| **Job Steps** *List all steps required to perform a task in the sequence they are performed* | **Potential Hazards** *How could you be hurt? What would the injury be?* | **Risk** *(initial)* | **Critical Actions to Mitigate Hazards** *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | **Risk** *(final)* |
|---|---|---|---|---|
| 1. Fitness for Duty check (performed at home prior to work) | 1a. Being unfit for duty – impacted by illness including coronavirus | 12 | 1a. Ensure you are fit for duty<br>Are you or have you been in any of these situations?<br>➢ I have had close contact with a confirmed case or a symptomatic person under investigation for coronavirus in the last 14 days.<br>➢ A doctor requested me to be tested for coronavirus or instructed me to self-quarantine?<br>➢ A member of my household or someone I was in close contact within the last 14 days experienced some of the following symptoms: fever, cough, shortness of breath, fatigue, sore throat, chills, gastro-intestinal disease or diarrhea, loss of taste/smell.<br>➢ I have or previously had some of the following symptoms in the last 7 days: fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body ache, headache, new loss of taste/smell, sore throat, congestion or runny nose, nausea or vomiting, or diarrhea.. | 4 |

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Field and Field Office – Precautions for Coronavirus | Control #: | Error! Reference source not found. **Rev # 6 (6/17/2020)** |
|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | | | ➢ Where required, my temperature check today shows a fever, without the use of fever reducing medications in the last 24 hours? (100.4 F [37.8C] or above or exceeding criteria required by local order or client requirements).<br><br>**If response is a YES, then do not access the workplace**. If AECOM employee, contact your Supervisor and the AECOM Nurse at **512-419-5016** for advice.<br><br>**If response is a NO or Yes, but released by AECOM nurse, you can proceed to work**. You may be asked to check your temperature again when you arrive to your workplace. | |
| ***On-Site Edits:*** | | | | |
| 2. Travel by vehicle or air required | 2a. Being in an enclosed space with poor air circulation in close contact with other people. | 12 | 2a. For Vehicle travel, review the "Preparations for Travel when Driving (fleet, rental and personal vehicles) to Minimize Coronavirus Exposure" THA for driving and the "Preparations for Travel when flying to Minimize Coronavirus Exposure" for flying. | 4 |
| ***On-Site Edits:*** | | | | |
| 3. General Field Work | 3a. Working Around Others | 12 | 3a. **Personnel must maintain at least 6-foot distance from each other** (see note below if this seems to be unachievable). Practice social distancing at tailgate meetings, in break rooms and job trailers. Completely avoid (if possible) or limit the number of people in job trailers and other confined areas at any one time so that this distance can be maintained. If possible, hold meetings outside. If indoors, open window(s) for circulation. Wipe down window handles prior to opening. Even when practicing social distancing, we must limit the amount of people in any one group to less than 10 people.<br><br>Clean all surfaces of your hands often with soap and water for at least 20 seconds. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands, including around and under fingernails and rub them together until they feel dry. When using hand sanitizer, be sure your hands are completely dry prior to touching any objects or surfaces.<br><br>Wear safety glasses or goggles and avoid contact/touching of face, eyes, nose, and mouth. Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw used tissues in the trash. Immediately wash or sanitize your hands.<br><br>**NOTE**: . Face coverings will also be worn where clients, states or municipalities require them. If you feel your task cannot be performed by maintaining social distancing, face coverings will be worn in combination with additional behavioral or PPE controls. If additional guidance is required, contact your SH&E manager to discuss the use of additional controlsPlease keep in mind, face coverings alone will not protect you from Coronavirus, so additional controls must be added.<br><br>If the need arises to enter a personal residence, **prepare a separate task specific THA** for this task. | 4 |
| | 3b. Handling Shared Equipment and Tools | 12 | | |

| Task Name: | Field and Field Office – Precautions for Coronavirus | Control #: | Error! Reference source not found. **Rev # 6 (6/17/2020)** |
|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | 3c. Exposure during Lunch and Bathroom Breaks | 12 | 3b. Wipe down and disinfect equipment before use with soap/water or disinfectant wipes. Wear disposable gloves when wiping surfaces down with disinfectant. Regularly wash hands when handling tools or equipment. Wash hands before eating or drinking.<br><br>3c. Be sure to wash hands with soap/water whenever a bathroom is nearby. At minimum, do so during bathroom and lunch breaks. Use a paper towel to open door handle when exiting bathroom. If using outside toilet facilities (i.e. Porta Johns), wash hands with soap and water or hand sanitizer both before and after opening/closing the door.<br><br>Where possible, employees are encouraged to pack meals and snacks as needed for the project duration and avoid visiting stores and restaurants. If necessary, modify your schedule to avoid restaurants and public restrooms during peak, i.e., crowded, periods to minimize contact with the public. Use drive-through service for food pick-up if available. | 4 |
| | 3d. Lack of food/water/supplies | 4 | Avoid eating lunch as a group, if you must, do so outside or in a space with windows open (wipe down windows prior to opening). Maintain 6 feet or more and do not share dishes (e.g., bag of chips, communal salad bowl, etc.) Refrain from sharing a field office coffee pot.<br><br>Many locations may have shortages of food, water, or supplies or closed restaurants. Bring food, water, and supplies to allow you to work a full shift without additional provisions. | 1 |
| ***On-Site Edits:*** | | | | |
| 4. Office Work | 4a. Working around others | 12 | 4a. Work from home when possible.<br><br>Clean hands often with soap and water for at least 20 seconds after using the restroom, after you have been in a public place, before and after eating or after blowing your nose, coughing, or sneezing. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands, including around and under fingernails, and rub them together until they feel dry. Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw used tissues in the trash. Immediately wash or sanitize your hands.<br><br>Sit at least six feet apart from others. Change workstations and meeting room setup to accommodate this social distancing. Even if you are practicing social distancing, we must still limit groups of people to less that 10. Do not eat or hang out in common areas.<br><br>Maintain social distancing during tailgate meetings and/or THA reviews, supervisor should seek verbal agreement from all and note this rather than passing pen and clipboard around for signature. Avoid passing round other items such as sign-in sheets as well.<br><br>Make hand-sanitizers, sanitizing wipes, and other hygienic supplies readily available. | 4 |
| | 4b. Encountering frequent "touch points" and handling shared equipment | 12 | 4b. Wipe down keyboards, mouse, phone, headset/headphones, any other "touch points". Limit contact of shared items. Wipe down surfaces before contacting them. Wash hands after handling or wear disposable gloves. | 4 |

| Task Name: | Field and Field Office – Precautions for Coronavirus | Control #: | Error! Reference source not found. **Rev # 6 (6/17/2020)** |
|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | | | In reception areas, use your own pen to sign in and out of offices. Remove unnecessary items such as business card holders, communal candy jars, etc.<br><br>Work with facilities to assign someone to clean AND disinfect frequently touched surfaces daily. Follow the manufacturer's instructions for all cleaning and disinfection products (e.g., concentration, application method and contact time. | |
| ***On-Site Edits:*** | | | | |



## Additional Notes:

**Where required, supplies (i.e., disinfectant spray/wipes, soap/hand sanitizer, nitrile gloves) should be made available prior to starting work. Request re-supply if stock runs low.**

Use disinfectant products that contain at least 70% alcohol. Use alcohol-based hand sanitizer that contains at least 60% alcohol. Wash hands with soap and water whenever available.
Remember that soap (including bar soap) is generally available and is considered superior to hand sanitizer or disinfectant wipes/spray.

Common touch points and surfaces include but are not limited to:

- Arms on chairs
- Tabletops
- Doorknobs and handles
- Countertops
- Elevator Buttons
- Coffee Pots
- Refrigerator / microwave / dishwasher / toaster handles
- Water Dispensers
- Cabinet and file drawer knobs / handles
- Shared office supplies such as staplers, paper cutters, scissors, packaging tape dispensers, writing utensils
- Phone receivers, keypads
- Copier / printer / fax control buttons
- Sink faucets
- Light switches

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Field and Field Office – Precautions for Coronavirus | Control #: | Error! Reference source not found. **Rev # 6 (6/17/2020)** |
|---|---|---|---|

If any staff are showing any possible symptoms of or have been in recent direct contact with others showing symptoms of CORONAVIRUS, **STOP WORK**. Notify the site supervisor and the project manager and go home and/or stay home. Contact the AECOM Incident Reporting Hotline (1-800-348-5046) and/or the AECOM Nurse Line (1-512-419-5016), and notify the Area SH&E Manager. A list of common symptoms to look out for can be found here: AECOM Guidance for Coronaviruses

Visit the CDC webpage on cleaning and disinfecting procedures: CDC Guidance for Community and Residential Cleaning-Disinfection for Coronavirus.

A list of approved disinfectants for use against SARS-CoV-2, the cause of CORONAVIRUS, is available here: US EPA List of Disinfectants Effective Against Coronaviruses

## Revision Log

| Version | Issued / Revised By | Date | Revision Summary |
|---|---|---|---|
| THA Revisions | | | |
| 0 | Amanda Lanning & Kelly Dwyer | March 23, 2020 | Original version |
| 1 | Patrick Walz | March 26, 2020 | Added new Step 1, Fitness for Duty Check. Modified language related to stopping work when PPE supplies are unavailable. Added instructions for making diluted bleach solution. Modified vehicle use instructions to allow long-term rental and fleet vehicle use. |
| 2 | Scott Dietz | April 2, 2020 | Added new Step 5, Traveling/Out of Town Work |
| 3 | Patrick Walz & Joan Root | April 13, 2020 | Modified language related to hotel stays. Moved instructions for making diluted bleach solution from PPE section to Step 6 and added hazards and mitigations. Added note regarding requirements for face coverings to PPE section, and added tips for obtaining sources of PPE. |
| 4 | Scott Dietz, Kelly Dwyer, Patrick Walz, & Devon Molitor | May 1, 2020 | Added revision log. Modified language related to office cleaning to clarify that facilities should be contacted to arrange office cleaning. Modified Step 3 to clarify social distancing requirements and added “note” with steps to take when not possible. |
| 5 | Walz, Dietz, Dwyer, Indorato, Gregory, Molitor, Cooter | May 5, 2020 | Modified the Fit for Duty language, removed requirement to wear nitrile gloves when driving and opening/closing doors and windows, modified language if AECOM personnel must enter a personal residence. |
| 6 | Walz, Dietz, & Shelley Brown | June 17, 2020 | Modified the symptoms of coronavirus, removed language regarding travel and hotel stays and provided link to new travel THAs which cover those topics in greater detail. Various additional minor modifications to text and formatting. Modified initial risk ratings. |
| Project-Specific Revisions | | | |
| | | | |
| | | | |
| | | | |

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Field and Field Office – Precautions for Coronavirus | Control #: | Error! Reference source not found. **Rev # 6 (6/17/2020)** |
|---|---|---|---|

## All Employees:

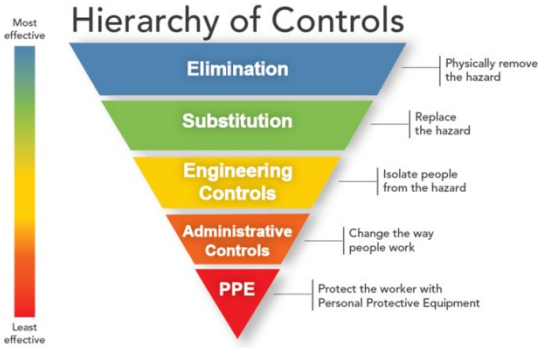
**STOP WORK** if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last-minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

**For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories**


- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***



| Worker Sign On | | Visitor Acknowledgement |
|---|---|---|
| *I participated in the on-site review and fully understand the content of this Task Hazard Assessment.* | | *Visitors review task hazards and acknowledge understanding* |
| **Printed Name** | **Signature** | |
| **1. Supervisor:** | | 1. |
| **2.** | | 2. |
| **3.** | | 3. |
| **4.** | | 4. |
| **5.** | | 5. |
| **6.** | | 6. |
| **7.** | | 7. |
| **8.** | | 8. |
| **9.** | | 9. |
| **10.** | | 10. |

**Submit a new THA for addition to the DCSA THA Library or send THA improvement suggestions to DCSA.THA.Library@AECOM.com**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Field and Field Office – Precautions for Coronavirus | Control #: | Error! Reference source not found. **Rev # 6 (6/17/2020)** |
|---|---|---|---|

**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Preparations for Travel when Driving (fleet, rental and personal vehicles) to Minimize Coronavirus Exposure | Control #: | Rev # 0 (6/1/2020) |
|---|---|---|---|

| Project Name: | Penn Yan Water Street Former MGP | Client: | NYSEG | Date: | 12/28/20 |
|---|---|---|---|---|---|
| Permits Required? (list): | | Work Location: | Penn Yan, NY | | |

**THIS THA MUST BE FULLY REVIEWED AND ACKNOWLEDGED DAILY BY ALL AECOM STAFF and AECOM SUBS ON-SITE**

**All job steps, hazards, work practices & PPE are to be clearly understood and implemented. All necessary revisions have been written on the THA.**

| | |
|---|---|
| **Required PPE:** | ☐ Hard Hat ☐ Safety Glasses ☐ HiVis Vest ☐ Safety Toe Boots ☒ Gloves: ☐ Hearing Protection ☐ Other:_____ |
| | Additional materials and supplies required:<br>Potable water and soap (preferable) or hand sanitizer w/ 70% alcohol<br>Disinfectant wipes<br>Tissues<br>Disposable gloves<br>Face coverings/face masks<br>One Gallon Zip Lock Bags<br>Safety goggles<br>Disinfectant spray List of Cleaning Products to Kill Coronavirus |
| **Tools & Equipment:** | |

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk *(initial)* | Critical Actions to Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk *(final)* |
|---|---|---|---|---|
| 1. Planning the trip | 1a. Potential exposure to Coronavirus | 4 | 1a. Map route in advance to minimize the potential for exposure and utilize the least populated route of travel where feasible. Avoid entering public places. If traveling more than 250 miles in one direction, develop a Journey Management Plan and be sure to add controls for protection against Coronavirus. | 2 |
| ***On-Site Edits:*** | | | | |
| 2. Preparing vehicle for driving | 2a. Possible exposure from touching contaminated surfaces, tools, equipment and materials in vehicle. | 8 | 2a. If feasible, use your personal vehicle or procure a fleet vehicle or a rental car (contact rental car company in advance) that hasn't been driven in the past 72 hours. Clean and disinfect the vehicle in accordance with the V**ehicle Cleaning THA** prior to driving. If possible, park the vehicle with the windows closed facing the sun (on sunny days), to allow the vehicle to heat up for 2-3 hours. | 4 |

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Preparations for Travel when Driving (fleet, rental and personal vehicles) to Minimize Coronavirus Exposure | Control #: | Error! Reference source not found. |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| ***On-Site Edits:*** | | | | | |
| 3. Driving to and from destination | | 3a. Possible exposure from passengers | 8 | 3a. Limit to one person per vehicle whenever possible. If a passenger must ride with you, limit to one passenger and have them sit in the rear passenger side seat. Crack and/or open windows and use fan to recirculate air. | 4 |
| ***On-Site Edits:*** | | | | | |
| 4. Stopping for restroom breaks and food | | 4a. Possible exposure due to contact with members of the general public at gas stations, convenience stores, restrooms, etc. | 12 | 4a. Plan trip to eliminate the need to stop for food or restroom breaks. Bring your own food/water/snacks if possible If you must stop, try avoid entering public places (use drive through services if possible). If you must enter public places, practice social distancing and wear a face covering. If you must use public restrooms, don disposable gloves prior to entering, doff and dispose of in trash receptacle when exiting. Wash hands with soap and water for at least 20 seconds or use a hand sanitizer before and after entering public places and restrooms. Have soap and water, antibacterial hand wipes or spray, 70% + alcohol hand sanitizer available. | 4 |
| ***On-Site Edits:*** | | | | | |
| 5. Fueling | | 5a. Possible exposure due to contact with members of the general public at gas stations, convenience stores, restrooms, etc. | 12 | 4a. Plan trip to eliminate the need to stop for fuel. When fueling, wear gloves and dispose of after use. Do not reenter the vehicle with gloves worn during fueling. If gloves are not available, wipe down the fuel pump handle and keypad prior using. If you don't have wipes, then consider using a paper towel or tissue to grab the fuel dispenser handle.<br><br>Where possible, use contactless payment methods to avoid touching keypads or pens. Consider using your knuckles rather than fingertips to touch common use contact areas like keypads. When finished, doff disposable gloves, dispose of in trash receptacle and wash hands with soap and water or hand sanitizer with at least 70% alcohol. | 4 |
| | | | | | |

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Preparations for Travel when Driving (fleet, rental and personal vehicles) to Minimize Coronavirus Exposure | Control #: | Error! Reference source not found. |
|---|---|---|---|

## Additional Notes:

**Where required, supplies (i.e., disinfectant spray/wipes, soap/hand sanitizer, nitrile gloves) should be made available prior to starting work. Request re-supply if stock runs low.**

Use disinfectant products that contain at least 70% alcohol. Use alcohol-based hand sanitizer that contains at least 60% alcohol. Wash hands with soap and water whenever available. Remember that soap (including bar soap) is generally available and is considered superior to hand sanitizer or disinfectant wipes/spray. If disinfectants are unavailable, prepare diluted bleach solution as described in Step 6 and use in their place.

If any staff are showing any possible symptoms of or have been in recent direct contact with others showing symptoms of CORONAVIRUS, **STOP WORK**. Notify the site supervisor and the project manager and go home and/or stay home. Contact the AECOM Incident Reporting Hotline (1-800-348-5046) and/or the AECOM Nurse Line (1-512-419-5016).

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## Revision Log

| Version | Issued / Revised By | Date | Revision Summary |
|---|---|---|---|
| THA Revisions | | | |
| 1 | Scott Dietz | June 1, 2020 | Original version |
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| | | | |
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| Project-Specific Revisions | | | |
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# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Preparations for Travel when Driving (fleet, rental and personal vehicles) to Minimize Coronavirus Exposure | Control #: | Error! Reference source not found. |
|---|---|---|---|

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Preparations for Travel when Driving (fleet, rental and personal vehicles) to Minimize Coronavirus Exposure | Control #: | Error! Reference source not found. |
|---|---|---|---|

## All Employees:

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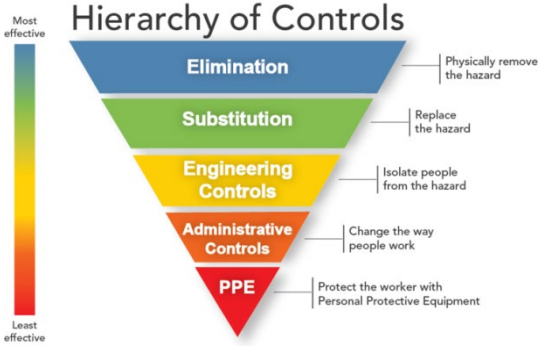


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# Task Hazard Assessment

| Task Name: | Preparations for Travel when Driving (fleet, rental and personal vehicles) to Minimize Coronavirus Exposure | Control #: | Error! Reference source not found. |
|---|---|---|---|

**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Coronavirus Vehicle Cleaning THA | Control #: | Rev # 1 (6/1/2020) |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Penn Yan Water Street Former MGP | Client: | NYSEG | **Date:** | 12/28/20 |
| **Permits Required? (list):** | None | **Work Location:** | Penn Yan, NY | | |

**THIS THA MUST BE FULLY REVIEWED AND ACKNOWLEDGED DAILY BY ALL AECOM STAFF and AECOM SUBS ON-SITE**

**All job steps, hazards, work practices & PPE are to be clearly understood and implemented. All necessary revisions have been written on the THA.**

| | |
|---|---|
| **Required PPE:** | ☐ Hard Hat ☒ Safety Glasses ☐ HiVis Vest ☐ Safety Toe Boots ☒ Nitrile ☐ Hearing Protection<br>Gloves: ☐ Other: See list below _____ |
| | Disposable gloves, in proper size for operator( avoid latex due to allergy concerns)<br>Face coverings or mask<br>Safety Glasses |
| **Tools & Equipment:** | Paper towels<br>Trash container/bags<br>Safety glasses<br>Small bucket of water<br>Dish soap<br>Disinfectant spray or wipes List of Cleaning Products to Kill Coronavirus<br><br>Note: Many of the same household cleaners (such as non-bleach, unscented, non-chlorinated disinfectant cleaners and wipes) that kill coronaviruses on hard surfaces at home can also clean most car interiors without causing damage. Alcohol solutions that contain at least 70 percent alcohol are effective against coronavirus, according to the CDC. Nearly every interior surface of a vehicle can be cleaned with isopropyl alcohol.<br>Vigorous washing with soap and water can also destroy the coronavirus. Soap and water are safe for most car interiors.<br><br>**Warning!**<br>• Don't use bleach or hydrogen peroxide on the inside of the vehicle.<br>• Don't use scented wipes or wipes containing bleach.<br>• Don't use ammonia-based cleaners on car touch screens or dashboards, as they can damage anti-glare and anti-fingerprint coatings.<br>• Never combine cleaning chemicals as doing so may lead to toxicity.<br>• If using alcohol, avoid any potential source of sparks/ignition. **DO NOT SMOKE!** |

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Coronavirus Vehicle Cleaning THA | Control #: | Error! Reference source not found. |
|---|---|---|---|

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk *(initial)* | Critical Actions to Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk *(final)* |
|---|---|---|---|---|
| 1. Plan for cleaning/disinfecting | 1a. Exposure to harsh disinfectants | 8 | 1a. Read the Safety Data Sheet or warnings/precautions on the label. Wear the PPE specified. At a minimum, gloves and safety glasses shall be worn. | 4 |
| | 1b. Not having the supplies necessary to perform the task (inadequate cleaning | 8 | 1b. Confirm that you have the necessary supplies and equipment before proceeding. If possible, prepare a supply kit with all necessary cleaning/disinfecting prior to travel. | 4 |
| | 1c. Damaging vehicle interior surfaces | 8 | 1c. Consult the owners manual to verify how to clean the various surfaces. Some surfaces may be adversely impacted by certain cleaners and by an excess application of water. | 4 |
| ***On-Site Edits:*** | | | | |
| 2. Prepare the vehicle for cleaning | 2a. Inadequate cleaning because of obstructed surfaces | 6 | 2a. Don gloves and safety glasses. Open all vehicle doors and remove all trash, water bottles, tools, equipment, etc., that are not part of the vehicle. Clean or discard as appropriate. | 4 |
| ***On-Site Edits:*** | | | | |
| 3. Inspect the vehicle and clean if necessary | 3a. Insufficient cleaning due to excessively soiled surfaces | 8 | 3a. Inspect the vehicle interior for any visibly soiled surfaces. If these are identified, clean those surfaces with a few drops of dish detergent in a bucket of water using a clean cloth. | 4 |
| | 3b. Damaging electronics | 6 | 3b. Avoid using excess water onto the surfaces | 4 |
| ***On-Site Edits:*** | | | | |
| 4. Disinfect frequent touch points **(see Additional Notes section for list)** | 4a. Accidental transfer of coronavirus to others. | 8 | 4a. Disinfect all frequently touched surfaces using the disinfectant identified. Consult the Additional Notes section for a list of surfaces to be considered. | 4 |
| | 4b. Improperly applying disinfectant and ruining vehicle surfaces | 10 | 4b. Test on small, inconspicuous surface first. Apply disinfectant in accordance with the instructions. Avoid excessive application. | 4 |

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Coronavirus Vehicle Cleaning THA | Control #: | Error! Reference source not found. |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| | | 4c. Eye, skin, or inhalation exposure to disinfectant | 10 | 4c. Apply disinfectant in accordance with the directions. Wear PPE as required. | 4 |
| ***On-Site Edits:*** | | | | | |
| 5. Hold time | | 6a. Eye, skin or lung irritation from residual disinfectant | 8 | 6a. Keep the vehicle doors open for 10-15 minutes after disinfecting to allow the vehicle to air out. If possible, park the vehicle with the windows closed facing the sun (on sunny days), to allow the vehicle to heat up for 2-3 hours. | 2 |
| | | 6b. Frequent changeover of vehicles | 8 | 6b. To the extent feasible, all vehicles should have a 72-hour wait/hold time between different drivers. Currently, the Coronavirus is believed to survive up to 72 hours on certain hard surfaces. Waiting 72-hours further minimizes the risk of exposure. | 4 |
| ***On-Site Edits:*** | | | | | |



## Additional Notes:

Surfaces can be a source of COVID-19 exposure and sharing vehicles can result in different people touching the surfaces of the vehicle.
Vehicles should be cleaned and disinfected **before use, after use, and when changing drivers**.
The cleaning should be conducted by the **vehicle operator**.
Cleaning supplies shall be stored in each vehicle to allow for periodic cleaning before and after use and during the day, as needed.

Common touch points and surfaces on vehicles include but are not limited to the following:

- Center console
- Dashboard surface
- Glove box,
- Inside door handles
- Keys/key fob
- Outside door handles
- Overhead console
- Parking brake handle

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Coronavirus Vehicle Cleaning THA | Control #: | Error! Reference source not found. |
|---|---|---|---|

- Rear view mirror
- Seat belts buckles
- Seat control
- Shift lever
- Steering wheel
- Sun visors
- Radio controls
- Touch screens

If any staff are showing any possible symptoms of or have been in recent direct contact with others showing symptoms of CORONAVIRUS, **STOP WORK**. Notify the site supervisor and the project manager and go home and/or stay home. Contact the AECOM Incident Reporting Hotline (1-800-348-5046) and/or the AECOM Nurse Line (1-512-419-5016).

A list of common symptoms to look out for can be found here:
AECOM Guidance for Coronaviruses

Visit the CDC webpage on cleaning and disinfecting procedures: CDC Guidance for Community and Residential Cleaning-Disinfection for Coronavirus

A list of approved disinfectants for use against SARS-CoV-2, the cause of CORONAVIRUS, is available here: US EPA List of Disinfectants Effective Against Coronaviruses



## Revision Log

| Version | Issued / Revised By | Date | Revision Summary |
|---|---|---|---|
| THA Revisions | | | |
| 1 | Lisa Rygiel | June 1, 2020 | Original version |
| | | | |
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| | | | |
| | | | |
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| Project-Specific Revisions | | | |
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# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Coronavirus Vehicle Cleaning THA | Control #: | Error! Reference source not found. |
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- ***What am I about to do?***
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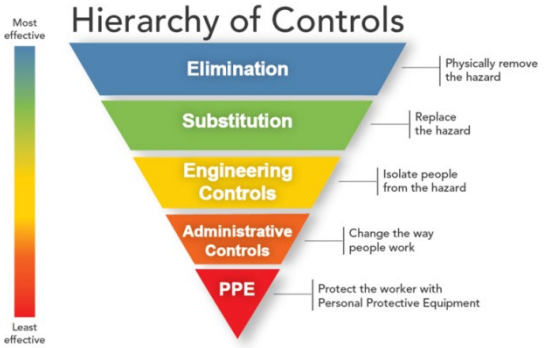
**For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories**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- ***What should you do? Stack your controls***
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# Task Hazard Assessment

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**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Gauging Liquid Levels in Groundwater Monitoring Wells | Control #: | 01-01-05-07 |
|---|---|---|---|

| Project Name: | Penn Yan Water Street Former MGP | Client: | NYSEG | Date: | 12/28/20 |
|---|---|---|---|---|---|
| Permits Required? (list): | None | Work Location: | Penn Yan, NY | | |

**This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.**

| Required PPE: | ☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile ☐ Hearing Protection ☐ Other: |
|---|---|
| Tools & Equipment: | Hand Tools Liquid level/Interface probe Decon materials |



**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk *(initial)* | Critical Actions To Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk *(final)* |
|---|---|---|---|---|
| 1. Visually clear proposed gauging locations | 1a. Exposure to biologic hazards: insects, poisonous plants and animals. Injuries could include anaphylactic shock, allergic reaction, rabies | 6 | 1a. Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, droppings, etc.). Wear cut resistant gloves, insect repellant; use a broom or a rake to move vegetation, not your hand or foot; move slowly | 4 |
| | 1b. Damage to equipment or vehicles due to surface / subsurface obstructions | 6 | 1b. Investigate travel path. Look for surface obstructions such as rubble, debris, old foundations or rebar. Use spotter is available or park in such a manner as to not have to back-up. | 4 |
| | 1c. Slips / trips / falls due to uneven terrain resulting in broken bones or torn ligaments. | 6 | 1c. Identify, mark and avoid slip, trip and fall hazards (holes, obstructions protruding from the ground, or debris). Contact PM immediately and do not proceed if any conditions are observed that cannot be controlled to make well gauging in the area safe. | 4 |
| | 1d. Struck by vehicle resulting in severe trauma or death | 10 | 1d. Visually inspect roadway for moving equipment if walking and set up vehicle as a barrier if driving. Set up exclusion zone around each well. Don reflective vest | 4 |
| ***On-Site Edits:*** | | | | |
| 2. Opening well casings / flush-mount covers and well plug lock | 2a. Cuts / lacerations / crushing, bruises | 6 | 2a. Avoid touching sharp materials/ edges. Wear cut resistant ANSI 2 gloves. Keep face, hands, fingers, and feet clear when opening and closing well cover. Inspect ground before kneeling, d on knee pads. | 2 |
| | 2b. Back strain | 4 | 2b. Stretch before working. DO NOT use awkward positioning. Keep back straight. Take regular rest/stretch breaks. Change position regularly. | 2 |

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Gauging Liquid Levels in Groundwater Monitoring Wells | Control #: | 01-01-05-07 | Error found |
|---|---|---|---|---|

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

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|---|---|---|---|---|
| | 2c. Vapor exposure resulting in inhalation hazards or illness | 4 | 2c. Stand upwind from the well opening to avoid vapor exposure. Loosen well cap slowly, keeping control if pressure is released due to vapors. Keep face out of line-of-fire. | 2 |
| | 2d. Biologic hazards: insects, poisonous plants, and animals | 6 | 2d. Slowly lift the well cover away from person and look for insects underneath the well. Use long handle tool to remove or kill any insects (i.e. screwdriver). | 4 |
| ***On-Site Edits:*** | | | | |
| 3. Lowering fluid meter probe and measuring tape to detect fluid level and total depth | 3a. Cuts / lacerations / bruises to knees (flush mount) | 4 | 3a. Inspect ground before kneeling. Remove any objects. Don knee pads | 2 |
| | 3b. Aches and strains from repetitive motion | 4 | 3b. Do not use awkward positioning. Keep back straight, take regular rest/stretch breaks. Change position regularly. | 2 |
| | 3c. Exposure to chemical hazards in groundwater resulting in skin irritation or illness | 3 | 3c. Use smooth movements to avoid splashes. Don nitrile gloves over cut resistant gloves and safety glasses with side shields. Check gloves for damages/ rips. | 2 |
| ***On-Site Edits:*** | | | | |
| 4. Removing fluid meter measuring tape and probe from well | 4a. Exposure to chemical hazards in groundwater resulting in inhalation hazard or illness | 4 | 4a. Stay upwind to avoid vapor exposure. | 2 |
| | 4b. Cross contamination of equipment | 4 | 4b. Clean the tape and probe using non-phosphate soap and distilled water. Wipe with clean paper towel. Collect decontamination materials for waste disposal. Wear disposable nitrile gloves. | 2 |
| | 4c. Cuts / lacerations / bruises to knees (flush mount) | 4 | 4c. Don knee pads and inspect ground before kneeling down and take frequent breaks to stand and stretch. | 2 |
| | 4d. Aches and strains from repetitive motion | 4 | 4d. See Step 3b. | 2 |
| | 4e. Trips / falls from entanglement in measuring tape | 3 | 4e. Check for location of measuring tape before walking or moving around. | 2 |

# Task Hazard Analysis

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|---|---|---|---|---|

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|---|---|---|---|---|
| ***On-Site Edits:*** | | | | |
| 5. Closing well casings / flush-mount covers | 5a. Cuts / lacerations / crushing / bruises<br>5b. Back strain from heavy / awkward materials handling | 4<br>4 | 5a. Avoid touching sharp materials/ edges. Keep face, hands, fingers, and feet clear when opening and closing well cover. Don knee pads and inspect ground before kneeling down.<br>5b. Keep back straight. Take regular rest/stretch breaks. Change position regularly.<br>* Verify that well covers are secure upon departure. | 2<br>2 |
| ***On-Site Edits:*** | | | | |
| 6. Gather gauging equipment and tools, place in work vehicle | 6a. Cuts / lacerations / crushing / bruises from gathering or dropping equipment<br>6b. Aches and strains from improper lifting | 3<br>4 | 6a. Maintain a secure grip on equipment and only carry manageable amount of equipment when demobilizing.<br>6b. Bend and lift with legs. Keep back straight. Take regular rest/ stretch breaks. Change position regularly. Team lift is required for items over 50 lbs. (or awkward items).<br>* Verify all tools and equipment are removed from the site. | 2<br>2 |
| ***On-Site Edits:*** | | | | |



## Additional Notes:

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Gauging Liquid Levels in Groundwater Monitoring Wells | Control #: | 01-01-05-07 | Error found |
|---|---|---|---|---|

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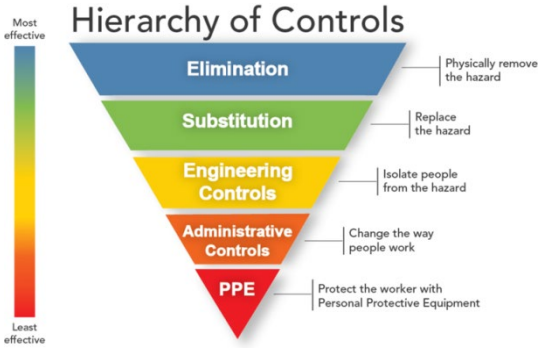


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**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| **Task Name:** | Groundwater Sampling – Low Flow | **Control #:** | 01-01-05-12 |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | **Penn Yan Water Street Former MGP** | **Client:** | NYSEG | **Date:** | 12/28/20 |
| **Permits Required? (list):** | None | **Work Location:** | Penn Yan, NY | | |

**This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.**

| | |
|---|---|
| **Required PPE:** | ☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile, cut resistant ☐ Hearing Protection ☐ Other: |
| **Tools & Equipment:** | Hand tools YSI Pump |



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| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk<br>*(initial)* | Critical Actions To Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk<br>*(final)* |
|---|---|---|---|---|
| 1. Visually clear proposed sampling locations | 1a. Exposure to biological hazards: insects, poisonous plants and animals. Injuries could include anaphylactic shock, allergic reactions, rabies. | 6 | 1a. Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, droppings, etc.). Wear cut resistant gloves, insect repellant, use a broom or a rake to move vegetation, not your hand or foot, move slowly | 4 |
| | 1b. Slip/trips, falls due to uneven terrain resulting in broken bones or torn ligaments. | 6 | 1b. Identify, mark and avoid slip, trip and fall hazards (holes, obstructions protruding from ground, or debris). Contact PM immediately and do not proceed if any conditions are observed that cannot be controlled to make well sampling in the area safe. | 4 |
| | 1c. Struck by vehicle resulting in severe trauma or death | **10** | 1c. Visually inspect roadway for moving equipment if walking and set up vehicle as a barrier if driving. Set up exclusion zone around each well. Don reflective vest. | 4 |
| ***On-Site Edits:*** | | | | |
| 2. Open well casing/flush-mount covers and well plug lock. | 2a. Cuts/lacerations/crushing, bruises | 6 | 2a. Avoid touching sharp material/edges. Wear cut resistant ANSI 2 gloves. Keep face, hands, fingers, and feet clear when opening and closing well cover. Inspect ground before kneeling. Don knee pads. | 2 |
| | 2b. Back strain from improper lifting | 4 | 2b. Stretch before working. DO NOT use awkward positioning. Keep back straight. Take regular rest/stretch breaks. Change position regularly. | 2 |
| | | 4 | 2c. Stand upwind from the well opening to avoid vapor exposure. Loosen well cap slowly, keeping control if pressure is released due to vapors. Keep face out of line-of-fire. | 2 |

# Task Hazard Analysis

AECOM Imagine it. Delivered.

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|---|---|---|---|---|
| | 2c. Vapor exposure resulting in inhalation hazards or illness<br>2d. Biologic hazards; insects, poisonous plants, and animals | 6 | 2d. Slowly lift the well cover away from person and look for insects underneath the well. Use long handle tool to remove or kill any insects (i.e. screwdriver). | 4 |
| ***On-Site Edits:*** | | | | |
| 3. Installing tubing in well and setting up equipment. | 3a. Cuts/lacerations/crushing, bruises | 6 | 3a. Avoid touching sharp material/edges. Keep face, hands, fingers feet clear when cutting tubing and setting up equipment. Wear cut resistant ANSI 2 gloves with disposable nitrile over gloves | 2 |
| ***On-Site Edits:*** | | | | |
| 4. Removing tubing from well | 4a. Exposure to chemical hazards in groundwater resulting in inhalation hazard or illness<br>4b. Cuts/lacerations/bruises to knee (flush mount) | 4<br>4 | 4a. Stay upwind to avoid vapor exposure<br>4b. Don knee pads and inspect ground before kneeling down and take frequent breaks to stand and stretch | 2<br>2 |
| ***On-Site Edits:*** | | | | |
| 5. Closing well casings/flush mount covers | 5a. Cuts/ lacerations/crushing, bruises<br>5b. Back strain from heavy/awkward material handling | 4<br>4 | 5a. Avoid touching sharp material/edges. Wear cut resistant ANSI 2 gloves. Keep face, hands, fingers feet clear when closing well cover. Don knee pads and inspect ground before kneeling down.<br>5b. Keep back straight. Take regular rest/stretch breaks. Change position regularly. | 2 |

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|---|---|---|---|---|
| ***On-Site Edits:*** | | | | |
| 6. Gather sampling equipment and tools, place in work vehicle | 6a. Cuts/lacerations/crushing/bruises from gathering or dropping equipment<br>6b. Aches and strains from improper lifting | 3<br>4 | 6a. Maintain a secure grip on equipment and only carry manageable amount of equipment when demobilizing.<br>6b. Bend and lift with legs. Keep back straight. Take regular rest/stretch breaks. Change position regularly. Team lift is required for items over 50 lbs (or awkward items) | 2<br>2 |
| ***On-Site Edits:*** | | | | |
| 7. | 7a. | | 7a. | |
| ***On-Site Edits:*** | | | | |



## Additional Notes:

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Error! Reference source not found. **Groundwater Sampling – Low Flow** | Control #: | Error! Reference source not found. |
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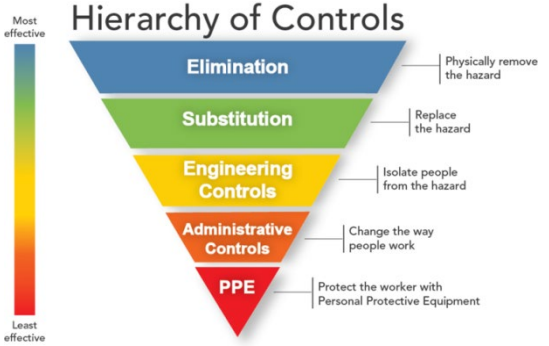


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| **9.** | | 9. |
| **10.** | | 10. |

**Submit a new THA for addition to the DCSA THA Library or send THA improvement suggestions to DCSA.THA.Library@AECOM.com**

# Task Hazard Analysis

| Task Name: | Error! Reference source not found. **Groundwater Sampling – Low Flow** | Control #: | Error! Reference source not found. |
|---|---|---|---|

**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| **Task Name:** | **Hollow Stem Auger Drilling Oversight and Well Installation** | **Control #:** | **01-01-03-05** |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | **Penn Yan Water Street Former MGP** | **Client:** | NYSEG | **Date:** | 12/28/20 |
| **Permits Required? (list):** | None | **Work Location:** | Penn Yan, NY | | |

**This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.**

| | |
|---|---|
| **Required PPE:** | ☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile ☒ Hearing Protection ☐ Other: |
| **Tools & Equipment:** | PID Noise/Sound Meter or app |



**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| **Job Steps** *List all steps required to perform a task in the sequence they are performed* | **Potential Hazards** *How could you be hurt? What would the injury be?* | **Risk** *(initial)* | **Critical Actions To Mitigate Hazards** *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | **Risk** *(final)* |
|---|---|---|---|---|
| 1. Mobilization | 1a. Striking unidentified underground utilities | 15 | 1a. Confirm public utility locating service has been contacted prior to initiating work activities. Use private locating service to mark out areas on private property. Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility marks as much as possible. Call to have utilities remarked if unsure as to their location. | 4 |
| | 1b. Striking overhead utilities | 15 | 1b. Follow the requirements of S3AM-322-PR1 Overhead Lines. Verify adequate clearance of all drilling locations prior to setting up at drilling location. | 4 |
| ***On-Site Edits:*** | | | | |
| 2. Setting up at drilling location | 2a. Biological hazards causing bites, stings or other injury | 8 | 2a. Examine ground surface for biological hazards prior to setting up equipment. If biological hazards exist, move equipment to a different area for set up if possible. Machetes, or other fixed open blade tools, are not permitted for clearing vegetation. Use insect repellent and check clothing for ticks periodically when applicable. | 4 |
| | 2b. Struck by traffic causing serious bodily injury | 10 | 2b. Be alert to other vehicles or pedestrians if work area is in an area with public access. Communicate with any heavy equipment operators in the area to ensure they know where you and the equipment are located. Don high visibility vest. | 4 |
| | 2c. Unstable Rig platform causing tip/fall with cruching injuries | 10 | 2c. Verify with contractor that rig is set up level and properly chocked and blocked. | 2 |

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Hollow Stem Auger Drilling Oversight and Well Installation | Control #: | Error! Reference source not found.**01-01-03-05** |
|---|---|---|---|

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk *(initial)* | Critical Actions To Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk *(final)* |
|---|---|---|---|---|
| ***On-Site Edits:*** | | | | |
| 3. Oversight of rig inspection | 3a. Mechanical failure of equipment | 10 | 3a. Verify that drilling contractor inspects equipment daily using S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection or equivalent. | 4 |
| | 3b. Emergency shut off disabled | 6 | 3b. Verify that kill switch on rig is tested and operational | 3 |
| ***On-Site Edits:*** | | | | |
| 4. Drilling Oversight | 4a. Flying debris, caught by/ struck by injuries | 8 | 4a. Keep a safe distance away during rig operation. Always stand outside of the tip/fall radius of the mast, recommended safe distance is to be no less than 30 feet away from the rig, or the mast height plus 5 feet. Do not talk on cell phone or be distracted by paperwork when in immediate proximity to rig. Stay a safe distance (minimum 5') from outriggers. Do not place or store any equipment on the rig. Verify that all personnel follow S3NA_321_PR1 Drilling, Boring, Direct Push Probing. Wear PPE including hard hats, steel-toe safety boots, safety glasses, and hearing protection. | 4 |
| | 4b. Caught in/by equipment | 10 | 4b. Keep hands, feet and other body parts shall be kept a minimum of 5' away from moving parts. When augers are rotating, stay clear of the rotating auger and other rotating/moving components of the drill rig, i.e. outriggers. Do not approach operator without making eye contact and getting approval. Watch for loose clothing (hooded sweatshirts, baggy clothing, loose shoelaces). | 4 |
| | 4c. Exposure to contaminants causing injury or illness | 8 | 4c. Position yourself upwind of the borehole whenever possible. Perform air monitoring using a PID as described in the HASP. **STOP WORK** if the action level is exceeded. | 4 |
| | 4d. Noise-induced hearing loss from loud drilling operations | 5 | 4d. Setup at least 30' away from noisy operations. Don't be near the rig when hammering. Measure dB levels with a noise meter. Wear hearing protection. | 3 |
| ***On-Site Edits:*** | | | | |

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Hollow Stem Auger Drilling Oversight and Well Installation | Control #: | Error! Reference source not found.**01-01-03-05** |
|---|---|---|---|

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk<br>*(initial)* | Critical Actions To Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk<br>*(final)* |
|---|---|---|---|---|
| 5. Well Casing Assembly and Installation Oversight | 5a. Exposure to contaminants causing injury of illness | 8 | 5a. Position yourself upwind of the borehole whenever possible. Perform air monitoring using a PID as described in the HASP. STOP WORK if the action level is exceeded. | 4 |
| | 5b. Flying debris, caught by/ struck by injuries | 8 | 5b. Keep a safe distance away during rig operation. Always stand outside of the tip/fall radius of the mast, recommended safe distance is to be no less than 30 feet away from the rig, or the mast height plus 5 feet. Do not talk on cell phone or be distracted by paperwork when in immediate proximity to rig. Stay a safe distance (minimum 5') from outriggers. Do not place or store any equipment on the rig. Verify that all personnel follow S3NA_321_PR1 Drilling, Boring, Direct Push Probing. Wear PPE including hard hats, steel-toe safety boots, safety glasses, and hearing protection | 4 |
| | 5c. Caught in/by equipment | **10** | 5c. Keep hands, feet and other body parts shall be kept a minimum of 5' away from moving parts. When augers are rotating, stay clear of the rotating auger and other rotating/moving components of the drill rig, i.e. outriggers. Do not approach operator without making eye contact and getting approval. Watch for loose clothing (hooded sweatshirts, baggy clothing, loose shoelaces) | 4 |
| ***On-Site Edits:*** | | | | |
| 6. | 6a. | | 6a. | |
| ***On-Site Edits:*** | | | | |
| 7. | 7a. | | 7a. | |
| ***On-Site Edits:*** | | | | |

# Task Hazard Analysis

| Task Name: | Hollow Stem Auger Drilling Oversight and Well Installation | Control #: | Error! Reference source not found.**01-01-03-05** |
|---|---|---|---|

**Additional Notes:**

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Hollow Stem Auger Drilling Oversight and Well Installation | Control #: | Error! Reference source not found.**01-01-03-05** |
|---|---|---|---|

## All Employees:

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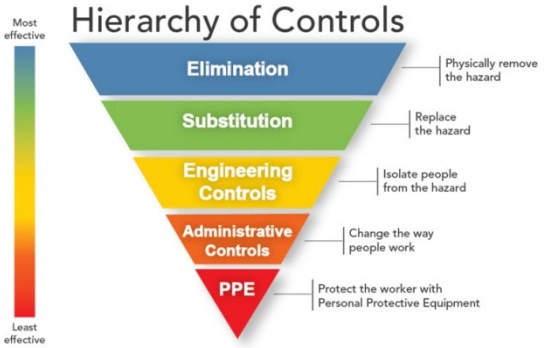
Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

**For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories**


- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***



| Worker Sign On | | Visitor Acknowledgement |
|---|---|---|
| *I participated in the on-site review and fully understand the content of this Task Hazard Assessment.* | | *Visitors review task hazards and acknowledge understanding* |
| **Printed Name** | **Signature** | |
| **1. Supervisor:** | | 1. |
| **2.** | | 2. |
| **3.** | | 3. |
| **4.** | | 4. |
| **5.** | | 5. |
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# Task Hazard Analysis

| Task Name: | Hollow Stem Auger Drilling Oversight and Well Installation | Control #: | Error! Reference source not found.**01-01-03-05** |
|---|---|---|---|

**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| Task Name: | Well Abandonment Oversight | Control #: | 01-01-03-08 |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | **Penn Yan Water Street Former MGP** | **Client:** | NYSEG | **Date:** | 12/28/20 |
| **Permits Required? (list):** | None | **Work Location:** | Penn Yan, NY | | |

**This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.**

| | |
|---|---|
| **Required PPE:** | ☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Cut Resistant, ☒ Hearing Protection ☐ Other: |
| **Tools & Equipment:** | First Aid Kit; Spill Kit; Fire Extinguisher; Hand Tools; Traffic cones or other suitable barrier |

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk<br>*(initial)* | Critical Actions To Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk<br>*(final)* |
|---|---|---|---|---|
| 1. Confirm One-Call, private utility contractor, and/or site personnel to locate and mark underground utilities. | 1a. Failure to have underground utilities identified could result in explosion, electrocution, injury, death, property damage. | 10 | 1a. Confirm public utility locating service has been contacted prior to initiating work. Use private locating service to mark out areas on private property. Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility marks as much as possible. Call to have utilities remarked if unsure as to their location. | 1 |
| ***On-Site Edits:*** | | | | |
| 2. Unload equipment | 2a. Cuts or hand injuries from share edges of cutting tools | 6 | 2a. Inspect equipment for damage and sharp edges, replace all broken or damaged equipment. Keep face, hands, fingers, and feet out of the line of fire of moving parts and tools. Wear cut resistant gloves at all times and watch hand placement to avoid sharp edges and pinch points | 2 |
| | 2b. Back strain/ overexertion when unloading equipment | 6 | 2b. Stretch before working. Bend and lift with legs and arms, not back. Team-lift any items that are awkward or over 50 pounds. If removing from the back of a truck, slide the case to the tailgate and lift from tailgate and not from the side of the truck bed. | 2 |
| ***On-Site Edits:*** | | | | |

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Well Abandonment Oversight | Control #: | Error! Reference source not found.**01-01-03-08** |
|---|---|---|---|

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk<br>*(initial)* | Critical Actions To Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk<br>*(final)* |
|---|---|---|---|---|
| 3. Set up work zone | 3a. Broken bones due to contact with vehicle or equipment traffic | 8 | 3a. Establish work zone using traffic control devices, signs, cones, etc. in advance of initiating monitoring well abandonment activities. Restrict access to observers and passersby. Don hi-visible vest. | 4 |
| | 3b. Sprains, strains or broken ankles or legs due to slip, trip or fall | 6 | 3b. Maintain housekeeping in work area, do not carry equipment where visibility of ground is impaired, remove or mark all trip hazards in work area. Plan travel path to avoid changes in surface. | 2 |
| ***On-Site Edits:*** | | | | |
| 4. Oversight of well abandonment | 4a. Caught in/by equipment | **10** | 4a. Keep hands, feet, and other body parts a minimum of 5' away from moving parts. Do not approach operator without making eye contact and getting approval. Watch for loose clothing (hooded sweatshirts, baggy clothing, loose shoelaces). | 4 |
| | 4b. Flying debris, caught by/struck by injurie | 8 | 4b. Keep a safe distance away from operations. Do not talk on cell phone or be distracted by paperwork when in immediate proximity to the work. Stay a safe distance (minimum 5') from outriggers. Do not place or store any equipment on the rig. Wear PPE including hard hats, steel-toe safety boots, safety glasses, and hearing protection | 4 |
| ***On-Site Edits:*** | | | | |
| 5. | 5a. | | 5a. | |
| ***On-Site Edits:*** | | | | |

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Well Abandonment Oversight | Control #: | Error! Reference source not found.**01-01-03-08** |
|---|---|---|---|

| REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on! | | | | |
|---|---|---|---|---|
| **Job Steps**<br>*List all steps required to perform a task in the sequence they are performed* | **Potential Hazards**<br>*How could you be hurt? What would the injury be?* | **Risk**<br>*(initial)* | **Critical Actions To Mitigate Hazards**<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | **Risk**<br>*(final)* |
| 6. | 6a. | | 6a. | |
| ***On-Site Edits:*** | | | | |
| 7. | 7a. | | 7a. | |
| ***On-Site Edits:*** | | | | |



## Additional Notes:

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Well Abandonment Oversight | Control #: | Error! Reference source not found.**01-01-03-08** |
|---|---|---|---|

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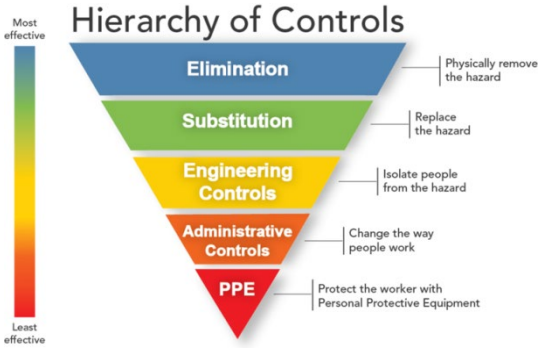


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| **1. Supervisor:** | | 1. |
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# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Well Abandonment Oversight | Control #: | Error! Reference source not found.**01-01-03-08** |
|---|---|---|---|

**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# Task Hazard Assessment

AECOM Imagine it. Delivered.

| **Task Name:** | Soil Sampling with Hand Auger or Trowel | **Control #:** | 01-01-09-01 |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | **NYSEG Penn Yan Former MGP Site** | **Client:** | NYSEG | **Date:** | 01/27/2022 |
| **Permits Required? (list):** | No | **Work Location:** | Penn Yan, New York | | |

**This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.**

| | |
|---|---|
| **Required PPE:** | ☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile, CR ☐ Hearing Protection ☐ Other: |
| **Tools & Equipment:** | Hand auger w/extensions Sampling kit |



**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| **Job Steps** *List all steps required to perform a task in the sequence they are performed* | **Potential Hazards** *How could you be hurt? What would the injury be?* | **Risk** *(initial)* | **Critical Actions To Mitigate Hazards** *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | **Risk** *(final)* |
|---|---|---|---|---|
| 1. Setup equipment | 1a. Cuts or hand injuries from pinch points | 3 | 1a. Inspect for broken welds on auger. If broken welds or cracks – **STOP WORK**. Wear cut resistant gloves at all times and avoid handling the sharp edges of the auger cup. Keep face, hands, fingers, and feet out of the line of fire of moving parts and tools | 2 |
| | 1b. Back strain/ overexertion when unloading equipment | 4 | 1b. Stretch before working. Bend and lift with legs and arms, not back. Team-lift any items that are awkward or over 50 pounds. If removing from the back of a truck, slide the case to the tailgate and lift from tailgate and not from the side of the truck bed | 2 |
| ***On-Site Edits:*** | | | | |
| 2. Advancing hand auger or trowel | 2a. Contacting utilities causing serious personal injury or death. | **10** | 2a. Ensure subsurface clearance protocol and permit requirements are being followed before beginning work. For hand auger: turn the auger slowly and if refusal is met, remove the auger from the borehole and inspect the cause of refusal. For trowel: scoop soil and place collected soil in sample container or bowl, as needed. If a utility, pea gravel, or non-native fill material is encountered, **STOP WORK** and call the PM. | 4 |
| | 2b. Back strain or pulled muscle from rotating hand auger. | 6 | 2b. Do not yank on the auger handle. Do not turn at waist, turn with arms and shoulders, keep feet square and lift with legs, do not work with arms above head. Take breaks and rotate work. Use short extensions as you advance to avoid. | 4 |
| | 2c. Injury from slip, trip, fall. | 4 | 2c. Clear the work area of trip hazards. Walk around bore hole, never over it and cover hole with delineator when unattended. | 3 |
| | 2d. Injury to eyes from flying debris. | 3 | 2d. If it is windy, stand upwind and switch to goggles to prevent dirt entering eye. | 2 |

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Soil Sampling with Hand Auger or Trowel | Control #: | Error! Reference source not found. |
|---|---|---|---|

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| Job Steps<br>*List all steps required to perform a task in the sequence they are performed* | Potential Hazards<br>*How could you be hurt? What would the injury be?* | Risk<br>*(initial)* | Critical Actions To Mitigate Hazards<br>*List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | Risk<br>*(final)* |
|---|---|---|---|---|
| ***On-Site Edits:*** | | | | |
| 3. Collecting soil samples | 3a. Contact with contaminated soil. | 4 | 3a. Use clean sampler to touch soil. Wear nitrile gloves over the cut resistant gloves at all times. If nitrile tears, stop work and replace glove. For samples with high volatile organics content (PID in breathing zone is constantly above site limits stated in HASP (>5 ppm)) wear breathing protection as stated in HASP. Change Nitriles between samples to avoid cross contamination | 2 |
| | 3b. Cut from handling auger, sampling tools, jars | 6 | 3b. Inspect containers before and during filling. Do not use if chipped or cracked. Pack containers in coolers so that they will not shift (spacers/ packing materials as needed). Do not over pack coolers. | 3 |
| | 3c. Muscle strain in back or legs from bending over or squatting | 3 | 3c. Evaluate work surface height (see if chair/ table needed) and sample jar placement to eliminate ergonomic issues. Avoid squatting and bending | 2 |
| ***On-Site Edits:*** | | | | |
| 4. Adding extensions to auger | 4a. Cuts or hand injuries from pinch points | 3 | 4a. Avoid placing hands near connection points of extensions and avoid the sharp edges of the auger cup. Wear cut resistant gloves at all times | 2 |
| | 4b. Striking another person | 3 | 4b. Check that the swing radius of the auger is clear before moving it | 2 |
| | 4c. Contacting overhead structure | **10** | 4c. Before raising the auger vertically, verify that no overhead lines or structures are present **STOP WORK** and move if electrical lines are in the area | 4 |
| ***On-Site Edits:*** | | | | |
| 5. Breakdown and decontaminate equipment. | 5a. Contact with contaminants and cut hazards | 5 | 5a. Inspect before handling for chips or cracks in glass containers. Wear nitrile gloves over cut resistant gloves. If nitrile tears, stop work and replace glove. | 2 |
| | 5b. Breaking a sample container resulting in cut, or contact with contents/preservatives | 3 | 5b. Handle containers with care and position over padded or soft surface in case it slips from hand. Place in packing materials that will protect against collisions. | 2 |

# Task Hazard Analysis

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|---|---|---|---|

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|---|---|---|---|---|
| | 5c. Striking another person | 4 | 5c. Before disassembling auger, verify that no one is in the swing radius. | 3 |
| ***On-Site Edits:*** | | | | |
| 6. | 6a. | | 6a. | |
| ***On-Site Edits:*** | | | | |
| 7. | 7a. | | 7a. | |
| ***On-Site Edits:*** | | | | |



## Additional Notes:

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Soil Sampling with Hand Auger or Trowel | Control #: | Error! Reference source not found. |
|---|---|---|---|

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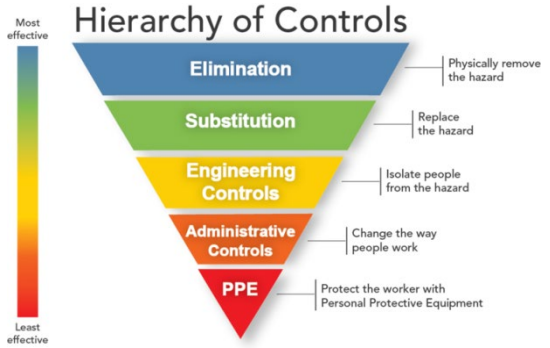


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| **Printed Name** | **Signature** | |
| **1. Supervisor:** | | 1. |
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| **10.** | | 10. |

**Submit a new THA for addition to the DCSA THA Library or send THA improvement suggestions to DCSA.THA.Library@AECOM.com**

# Task Hazard Analysis

AECOM Imagine it. Delivered.

| Task Name: | Soil Sampling with Hand Auger or Trowel | Control #: | Error! Reference source not found. |
|---|---|---|---|

**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# B-3: BLANK THA AND DAILY TAILGATE MEETING FORMS

AECOM

Americas

# Daily Tailgate Meeting

S3AM-209-FM5

**Instructions:** Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics**. This meeting is a daily refresher, not a full orientation**. Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

**AECOM Supervisor Name:**
**Phone Number:**

**AECOM SH&E Rep. Name:**
**Phone Number:**

**Meeting Leader:**

| **Date:** | **Project Name/Location:** | **Project Number:** |
|---|---|---|

**Today's Scope of Work:**

| **Muster Point Location:** | **First Aid Kit Location:** | **Fire Extinguisher Location:** | **Spill Kit Location:** |
|---|---|---|---|

## 1. Required Topics

- ☐ Fitness for Duty requirements, all sign in / sign out
- ☐ Required training (incl. task specific) completed and current
- ☐ SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.)
- ☐ Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting
- ☐ STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA
- ☐ Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition
- ☐ Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location
- ☐ Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all
- ☐ Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified
- ☐ Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public
- ☐ Required checklists/records available, understood (describe):
- ☐ Lessons Learned / SH&E improvements (describe):

## 2. Discuss if Applicable to Today's Work

☑ ■ **Check ☑ as reviewed or mark ■ as not applicable**

- ☐ ☐ Biological/ Chemical / Electrical Hazards
- ☐ ☐ Ergonomics - Lifting, Body Position
- ☐ ☐ Lock Out/ Tag Out
- Short Service Employees - visual identifier and mentor/ oversight assignment
- ☐ ☐ Simultaneous/ Neighbouring Operations
- ☐ ☐ Slip/ Trip/ Fall Hazards
- ☐ ☐ Specialized PPE Needs
- ☐ ☐ Traffic Control
- ☐ ☐ Waste Management/ Decontamination
- ☐ ☐ Weather Hazards / Heat Stress / Cold Stress
- ☐ ☐ Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.)
- ☐ ☐ Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach):
- ☐ ☐ Other Topics (describe/attach):
- ☐ ☐ Client specific requirements (describe):



## 3. Daily Check Out by Site Supervisor

| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |
|---|---|

***The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.***

| **Site Supervisor Name** | **Signature** | **Date**<br>**Time** **(at end of day / shift)** |
|---|---|---|

**Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.**

**All employees:**

- **STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.**
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

**SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:**

* The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
* The hazards & control measures associated with each task you are about to perform.
* The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
* That no tasks or work is to be performed without a hazard assessment.
* Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

**Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:**

* You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
* You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
* You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
* You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|---|---|---|---|
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
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| | | In & Fit | Out & Fit |



(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

**SITE VISITOR / SITE REPRESENTATIVE**

| Name | Company Name | Arrival Time | Departure Time | Signature |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Task Hazard Assessment – DCSA

AECOM Imagine it. Delivered.

| **Task Name:** | Error! Reference source not found.Click here to enter text. | **Control #:** | Error! Reference source not found.Click here to enter text. |
|---|---|---|---|

| **Project Name:** | **Penn Yan Water Street MGP** | **Client:** | NYSEG | **Date:** | |
|---|---|---|---|---|---|
| **Permits Required? (list):** | | **Work Location:** | Penn Yan, NY | | |

**This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.**

| **Required PPE:** | ☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: _____ ☐ Hearing Protection ☐ Other: _____ |
|---|---|
| **Tools & Equipment:** | |



**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| **Job Steps** *List all steps required to perform a task in the sequence they are performed* | **Potential Hazards** *How could you be hurt? What would the injury be?* | **Risk** *(initial)* | **Critical Actions To Mitigate Hazards** *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | **Risk** *(final)* |
|---|---|---|---|---|
| 1. | 1a. | | 1a. | |
| ***On-Site Edits:*** | | | | |
| 2. | 2a. | | 2a. | |
| ***On-Site Edits:*** | | | | |
| 3. | 3a. | | 3a. | |

# Task Hazard Assessment – DCSA

AECOM Imagine it. Delivered.

| **Task Name:** | Error! Reference source not found.Click here to enter text. | **Control #:** | Error! Reference source not found.Click here to enter text. |
|---|---|---|---|

**REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!**

| **Job Steps** *List all steps required to perform a task in the sequence they are performed* | **Potential Hazards** *How could you be hurt? What would the injury be?* | **Risk** *(initial)* | **Critical Actions To Mitigate Hazards** *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.*** | **Risk** *(final)* |
|---|---|---|---|---|
| ***On-Site Edits:*** | | | | |
| 4. | 4a. | | 4a. | |
| ***On-Site Edits:*** | | | | |
| 5. | 5a. | | 5a. | |
| ***On-Site Edits:*** | | | | |
| 6. | 6a. | | 6a. | |
| ***On-Site Edits:*** | | | | |
| 7. | 7a. | | 7a. | |
| ***On-Site Edits:*** | | | | |

# Task Hazard Assessment – DCSA

| Task Name: | Error! Reference source not found.Click here to enter text. | Control #: | Error! Reference source not found.Click here to enter text. |
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**Additional Notes:**

# Task Hazard Assessment – DCSA

AECOM Imagine it. Delivered.

| Task Name: | Error! Reference source not found.Click here to enter text. | Control #: | Error! Reference source not found.Click here to enter text. |
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## All Employees:

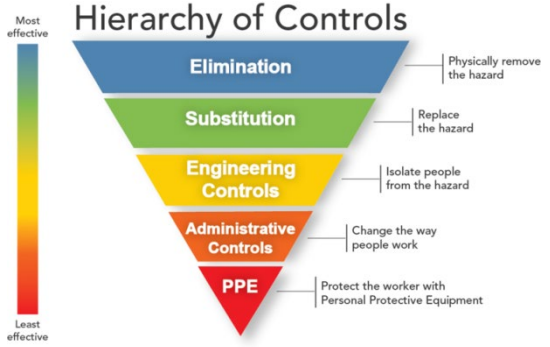
**STOP WORK** if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

**For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories**


- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***



| Worker Sign On | | Visitor Acknowledgement |
|---|---|---|
| *I participated in the on-site review and fully understand the content of this Task Hazard Assessment.* | | *Visitors review task hazards and acknowledge understanding* |
| **Printed Name** | **Signature** | |
| **1. Supervisor:** | | 1. |
| **2.** | | 2. |
| **3.** | | 3. |
| **4.** | | 4. |
| **5.** | | 5. |
| **6.** | | 6. |
| **7.** | | 7. |
| **8.** | | 8. |
| **9.** | | 9. |
| **10.** | | 10. |

**Submit a new THA for addition to the DCSA THA Library or send THA improvement suggestions to DCSA.THA.Library@AECOM.com**

# Task Hazard Assessment – DCSA

| Task Name: | Error! Reference source not found.Click here to enter text. | Control #: | Error! Reference source not found.Click here to enter text. |
|---|---|---|---|

**Include a copy of the new THA or a photo of the THA modifications as appropriate.**

# ATTACHMENT C

## AECOM SH&E Procedures

All AECOM SH&E Procedures, in their controlled copy version, are available on the internal SH&E Policy and Procedures ecosystem page.

Programmatic procedures referenced in this document (for example SH&E Training) **DO NOT** need to be printed for inclusion in this HASP. Only procedures that are needed for field activity reference and application **MUST** be printed in full and included in this section.

Copy the Field Procedure Checklist from the Physical and Biological Hazards Section 7 to become your table of contents for these attachments. Include only those procedures checked as applicable to this project.

Americas

# Cold Stress

S3AM-112-PR1

## 1.0 Purpose and Scope

1.1 To protect employees from the severest effects of cold stress (hypothermia) and cold injury and to identify exposures to cold working conditions under which it is believed nearly all employees can be repeatedly exposed without adverse health effects.

1.2 This procedure applies to all AECOM Americas based employees and operations, and any other entity and its personnel contractually required to comply with this document's content, working outdoors in damp and cool (below 50 degrees Fahrenheit [°F] or 10 degrees Celsius [°C]) conditions or anytime temperatures are below 32°F or 0°C.

## 2.0 Terms and Definitions

2.1 **Cold Stress** – The production of physiological effects due to cold temperatures and\or wind chill.

2.2 **Equivalent Chill Temperature (ECT)** – Also known as Wind Chill (see below).

2.3 **Frostnip** – Superficial cooling of tissues without cellular destruction.

2.4 **Frostbite –** Freezing of tissue, resulting in tissue destruction.

2.5 **Hypothermia –** Condition of reduced core body temperature to 95ºF (35ºC) resulting in loss of dexterity, loss of mental alertness, collapse, and possible death.

2.6 **Wind Chill –** The combined effect of air temperature and wind. Also expressed as "equivalent chill temperature" (ECT), wind chill is defined as heat loss resulting from the effects of air temperature and wind velocity upon exposed skin.

## 3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-128-PR1 Medical Screening & Surveillance Program

3.3 S3AM-208-PR1 Personal Protective Equipment

3.4 S3AM-314-PR1 Working Alone

3.5 S3AM-315-PR1 Working On or Near Water

3.6 S3AM-333-PR1 Marine Safety & Vessel Operations

## 4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Ensuring the safety of employees on their project sites, consistent with regulatory standards.
- Implement cold stress prevention measures as applicable at each work site.
- Develop/coordinate a work-warning regimen, as applicable.
- Confirm cold stress hazard assessments/evaluations were completed for the planned activities.
- Assign employees physically capable of performing the assigned tasks. Consider acclimation to cold weather when evaluating employee capability.

- Confirm employees are properly trained to recognize the symptoms of cold stress.

4.1.2 **Safety, Health and Environment (SH&E) Manager**

- Conduct/support cold stress assessments/evaluations.
- Conduct/support incident investigations related to potential cold stress-related illnesses.
- Assist project teams develop appropriate work-warming regimens.
- Provide cold stress awareness training.

4.1.3 **Supervisor**

- Identify the tasks that may be most impacted by cold stress and communicate the hazard to the assigned employees.
- Confirm that employees have been trained on the recognition of cold stress-related illnesses.
- Confirm that adequate supplies of warm fluids/drinks are readily available to employees.
- Confirm that a warm/sheltered rest area is available, as applicable.
- Conduct cold stress monitoring, as applicable.
- Implement the work-warming regimen.
- Confirm that first aid measures are implemented once cold stress symptoms are identified.
- Confirm that employees are physically capable of performing the assigned tasks and are not in a physically compromised condition.

4.1.4 **Employee**

- Observe each other for the early symptoms of cold stress-related illnesses.
- Maintain an adequate intake of available fluids.
- Report to work in a properly rested condition.
- Report all suspected cold stress-related illnesses.

4.2 Requirements

4.2.1 Carefully plan work anticipated to be performed in cool or cold conditions. If possible, heavy work should be scheduled during the warmer parts of the day or when the wind is most calm. Include costs in project budgets for specialized equipment and supplies needed to complete the field activities.

4.2.2 Staff working in extreme cold (wind chill or ECT below 10ºF or -12ºC) shall not work alone. The Buddy System shall be utilized to keep an eye on each other and to watch for signs of cold stress. Refer to *S3AM-314-PR1 Working Alone*. Watch for symptoms and signs of hypothermia

4.2.3 Monitor weather forecasts and weather conditions such as ambient temperature, wind speed, and precipitation. Use observations prior to entering and while in the field to ensure appropriate protections are in place:

- If possible, move the work to a warm location.
- If possible and as applicable, erect shelters or screens around the work area.
- If possible, heat the work area.
- If possible, adjust schedule according to the cold conditions, work level and worker acclimatization.
- Implement a work-warming regimen by taking breaks out of the cold. As applicable, consult *S3AM-112 ATT1 Temperature Thresholds* to determine wind chill and work-warming schedule.
- Take frequent short breaks in warm dry shelters to allow your body to warm up. Limit time of exposure to the cold. If shelter is not readily available, consider supplying temporary shelters.

- Provide assistance to prevent body heat loss, such as:
  - Providing appropriate sources of heat (e.g. warm packs, portable heaters, etc.).
  - Use of insulating materials on equipment handles when temperatures drop below 30°F (-1°C).

4.2.4 All staff working in extreme cold or snow conditions should understand the following guidelines for preventing and detecting hypothermia and frostbite; refer to *S3AM-112-ATT2 Symptoms & Treatment*:

- Ensure appropriate PPE requirements are established and adhered to.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Because prolonged exposure to cold air or to immersion in cold water at temperatures even well above freezing can lead to dangerous hypothermia, whole-body protection shall be used.
- Eat high calorie snacks to help maintain body metabolism.
- Confirm extra blankets or sleeping bags are on-site.
- Drink plenty of warm liquids. It is easy to become dehydrated in cold weather.
- Avoid caffeine and alcohol, which can act as diuretics. Alcohol consumption, depending upon quantity, can dilate blood vessels enhancing body heat loss or constrict blood vessels decreasing heat delivery to extremities.
- NEVER IGNORE SHIVERING. Persistent or violent shivering is a clear warning that you are on the verge of hypothermia.
- If you experience frost bite or hypothermia, find shelter and warmth and contact a medical practitioner if symptoms persist, refer to *S3AM-128-PR1 Medical Screening & Surveillance*.

4.3 Training

Before they begin work in a cold environment, employees that might be exposed to cold stress will be informed of the potential for cold stress and how to prevent cold stress. Employees that have not had the training within the twelve prior months shall repeat the training before exposure to cold stress, refer to *S3AM-003-PR1 SH&E Training*. Employees potentially exposed to cold stress will receive training including, but not limited to:

4.3.1 Sources of cold stress, the influence of protective clothing, and the importance of acclimatization.

4.3.2 How the body loses heat.

4.3.3 Recognition of cold-related illness symptoms.

4.3.4 Cold stress preventative/corrective measures including, but not limited to:

- Weather monitoring.
- Proper eating and drinking practices.
- Work-warming schedules and proper re-warming techniques.
- Buddy system.
- Safe cold work practices appropriate to the work that is to be performed.
- Proper use of cold environment personal protective clothing.

4.3.5 The harmful effects of excessive alcohol consumption in a cold stress environment.

4.3.6 The hazards associated with unstable snow or ice build ups.

4.3.7 First aid procedures for symptoms related to cold stress.

4.4 Personal Protective Equipment (PPE)

Wearing the right clothing is crucial to avoiding cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, on the other hand, retains its insulation even when wet. Adequate insulating dry clothing will be required in air or wind chill temperatures below 40 °F (4.4°C)

All PPE will comply with the requirements of *S3AM-208-PR1 Personal Protective Equipment* and consider the following requirements:

4.4.1 Wear at least 3 layers of clothing to help prevent cold stress. It is important to preserve the air space between the body and the outer layer of clothing to retain body heat.

- Wear a middle layer of down, wool, or similar materials to provide insulation.
- Avoid cotton, especially blue jeans.
- Wear an outer layer to break the wind and allow some ventilation (e.g., Gortex® or nylon)
- Do not wear tight clothing. Loose clothing allows better ventilation.

4.4.2 Wear proper clothing, including head coverings and gloves or mittens for cold, wet, and windy conditions.

4.4.3 Wear a hat or hardhat liner. Up to 40 percent of body heat can be lost when the head is left exposed.

4.4.4 Use insulated footwear with adequate traction to prevent slips and falls.

4.4.5 Wear insulated boots or other insulated footwear, and insulated gloves to help reduce the chance of frostbite.

4.4.6 Keep a change of dry clothing available in case work clothes become wet.

4.4.7 Eye and face protection for employees employed outdoors in a snow and/or ice-covered terrain should be supplied.

- Sunglasses (with UVA and UVB protection) and sunscreen should be used when there is a persistent combination of snow and direct sun.
- Special safety goggles to protect against blowing ice crystals and ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) should be required when there is an expanse of snow coverage causing a potential eye exposure hazard.
- Ensure face guards are used to protect skin in cold, windy conditions, including riding on an unshielded vehicle.

4.5 General Cold Stress Prevention Measures

4.5.1 In order to prevent hypothermia:

- Wear appropriate clothing and PPE as determined by the weather conditions.
- When active, ventilate excess heat by opening or removing outer layers of clothing to avoid sweating.
    - Start with the mitten or gloves, unless protection from ice, snow, or cold metal surfaces is needed.
    - Next remove head gear and neck wrappings.
    - Then coats/parkas should be opened at the waist and sleeves.
    - Finally, layers of clothing should be taken off.
    - When resting or tired, or colder conditions are encountered, add additional layers of clothing/ close outer layers in the reverse of the above order, or get out of the cold. Have a sweet drink but do not indulge in heavy eating.

- Garments worn to keep out rain and spray should also allow water vapor to escape.
- Take advantage of heat from the sun and stay out of the wind as much as possible.
- Have available emergency shelter providing protection from wind and rain and insulation from the ground.
- Replace wet clothing. If wet clothing cannot be replaced, then cover it with a layer of non-breathing material to prevent evaporation. Place an insulation layer over this non-breathing material.
- Get adequate rest; conserve energy.
- Get adequate nutrition to replenish energy stores; rest after meals.
- Drink adequate fluids to avoid dehydration.
- If any project / location staff member shows signs of hypothermia, stop and treat him/her.

4.5.2 In order to prevent frost bite:

- Dress to prevent hypothermia and protect the feet and hands.
- Avoid obstruction of circulation by, for example, tight boots or tightly fitting clothing.
- Avoid nicotine (particularly cigarettes) and do not consume alcohol.
- Keep ears and nose covered and out of the wind.
- Frostbite of the corneas of the eyes can be prevented by protective goggles.
- Adopt a “buddy system” of constantly watching the faces of others in the party for white skin tissue, which is evidence of frostbite (frostnip).
- Practice constant personal vigilance for signs of trouble in one’s own fingers and toes; when in doubt, investigate thoroughly before it is too late.

4.5.3 Adequate, insulating dry clothing that will help maintain core temperatures above 96.8°F (37°C) shall be provided to employees if work is performed in air temperatures below 40°F (4.4°C). Wind chill cooling rate and the cooling power of air are critical factors. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.

4.5.4 An Equivalent Chill Temperature (ECT) chart relating the actual dry bulb air temperature and the wind velocity is presented in *S3AM-112-ATT1 Temperature Thresholds*. Unless unusual or extenuating circumstances exist, cold injury to other than hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia. Superficial or deep local tissue freezing will occur only at temperatures below 32°F (0°C) regardless of wind speed. However, older employees, those with circulatory problems and those with previous cold injuries require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions that should be considered.

4.5.5 Continuous exposure of skin should not be permitted when the air speed and temperature results in an ECT of –25°F (-32°C) or below.

4.5.6 At air temperatures of 40°F (4.4°C) or less, it is imperative that employees who become immersed in water or whose clothing becomes wet be immediately removed from the cold environment, provided a change of clothing, and be treated for hypothermia.

4.5.7 If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.

4.5.8 Adequate protection, such as general ventilation, shall be incorporated into any warming shelter design to prevent carbon monoxide poisoning.

4.5.9 Operation of internal combustion or similar devices within warming shelters is prohibited.

4.5.10 If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.

4.5.11 Walking and working surfaces shall be cleared of ice and snow to prevent slips and falls.

4.5.12 Confirm that employees carry fire starter materials if working in remote areas.

4.5.13 Supplies such as PPE, fuels, enclosures, de-icing, traction aids, warm drinks, and batteries will be specified by the SH&E Manager and/or the Manager and made available. These supplies will be inspected at least weekly during cold weather projects and replaced when necessary.

4.6 Cold Stress Prevention Measures for the Hands

4.6.1 Special protection of the hands is required to maintain manual dexterity for the prevention of accidents including, but not limited to the following:

- If fine work is to be performed with bare hands for more than 10 to 20 minutes in an environment below 60ºF (15ºC), special provisions should be established for keeping the employees' hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized. Metal handles of tools and control bars should be covered by thermal insulating material at temperatures below 30ºF (-1º C).
- If the air temperature falls below 60ºF (15ºC) for sedentary work, 40ºF (4.4º C) for light work, or 20ºF (-6ºC) for moderate work, and fine manual dexterity is not required, employees should use gloves.

4.6.2 To prevent contact frostbite, employees should wear anti-contact gloves:

- When cold surfaces below 20°F (-6°C) are within reach, each employee should be warned to prevent inadvertent contact by bare skin.
- If the air temperature is 0°F (-18°C) or less, employees should protect their hands with mittens or appropriate gloves. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens or gloves.
- Ensure an adequate supply of dry gloves is available to replace wet gloves.

4.6.3 Provisions for additional total body protection are required if work is performed in an environment at or below 40ºF (4.4ºC). The employees should wear cold protective clothing appropriate for the level of cold and physical activity.

4.6.4 Additional Cold Stress Prevention Measures:

For work practices at or below 10ºF (-12ºC) ECT, the following will apply:

- The employee should be under constant protective observation (buddy system or supervision).
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work is being performed, rest periods should be taken in heated shelters and opportunities to change into dry clothing should be provided.
- New employees should not be required to work full time in the cold during the first days of employment until they become acclimated to the working conditions and required protective clothing. Refer to *S3AM-112-ATT1 Temperature Thresholds* for guidance.
- The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the employee.
- The work should be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats should not be used. The employee should be protected from drafts to the greatest extent possible.

4.6.5 Employees handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 40ºF should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of “cryogenic fluids” or those liquids with a boiling point that is just above ambient temperature.

4.6.6 Trauma sustained in freezing or subzero conditions requires special attention, because an injured employee is predisposed to cold injury. Special provisions should be made to prevent hypothermia and freezing of damaged tissue in addition to providing for first aid treatment.

4.7 Hypothermia in Water

4.7.1 Loss of body heat heat to the water is a major cause of deaths in boating and working near water incidents. Often the cause of death is listed as drowning; however, the primary cause is often hypothermia. It should also be noted that alcohol lowers the body temperature around 2 to 3 degrees by dilating the blood vessels. Do not drink alcohol around cold water. The following table shows the effects of hypothermia in water:

| WATER TEMPERATURE | | EXHAUSTION | SURVIVAL TIME |
|---|---|---|---|
| 32.5°F | (0°C) | Under 15 minutes | Under 15 to 45 minutes |
| 32.5 to 40°F | (0 to 4°C) | 15 to 30 minutes | 30 to 90 minutes |
| 40 to 50°F | (4 to 10°C) | 30 to 60 minutes | 1 to 3 hours |
| 50 to 60°F | (10 to 16°C) | 1 to 2 hours | 1 to 6 hours |
| 60 to 70°F | (16 to 21°C) | 2 to 7 hours | 2 to 40 hours |
| 70 to 80°F | (21 to 27°C) | 3 to 12 hours | 3 hours to indefinite |
| Over 80°F | (27°C) | Indefinite | Indefinite |

4.7.2 Some points to remember when water is a potential hazard:

- Wear a personal flotation device when drowning is a potential hazard. Refer to *S3AM-315-PR1 Working On or Near Water*, and *S3AM-333-PR1 Marine Safety & Vessel Operations*.
- If the water is less than 50°F (10°C), wear a wet suit or dry suit for work in water (e.g., wading, or if a significant potential to fall in water exists).
- While in the water, do not attempt to swim unless to reach nearby safety. Unnecessary swimming increases the rate of body heat loss. Keep the head out of the water. This will increase survival time.
- Keep a positive attitude about rescue. This will increase chances of survival.
- If there is more than one person in the water, huddling is recommended to conserve body heat.

4.7.3 If an employee or equipment is to work on ice and the water beneath the ice is or may be more than 3¼ feet (1m) deep at any point:

- Test the ice prior to commencing to ensure it will support the load to be placed on it. Ongoing testing may be necessary.
- If there is any risk of falling through the ice employees must wear personal protective equipment that will ensure buoyancy and protect against hypothermia at all times while on the ice.

4.8 Work-Warming Regimen

4.8.1 If work is performed continuously in the cold at an equivalent chill temperature (ECT) at or below 19ºF (–7ºC), heated warming shelters (tents, cabins, rest rooms, etc.) should be made available nearby. The employees should be encouraged to use these shelters at regular intervals; the frequency will depend on the severity of the environmental exposure. Refer to *S3AM-112-ATT1 Temperature Thresholds* for guidance.

4.8.2 The onset of heavy shivering, minor frostbite (frostnip), the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter.

4.8.3 When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing should be loosened to permit sweat evaporation or a change of dry work clothing provided.

4.8.4 A change of dry work clothing should be provided as necessary to prevent employees from returning to the cold environment with wet clothing.

## 5.0 Records

5.1 Exposure assessments will be documented in the location's files.

## 6.0 Attachments

6.1 S3AM-112-ATT1 Temperature Thresholds

6.2 S3AM-112-ATT2 Symptoms & Treatment

Americas

# Heat Stress

S3AM-113-PR1

## 1.0 Purpose and Scope

1.1 Establishes a Heat Illness Prevention Program to guide employees in preventing heat illness, recognition of the symptoms of heat stress-related illnesses and in taking the appropriate corrective action.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

## 2.0 Terms and Definitions

2.1 **Acclimated –** Employees who have developed physiological adaptation to hot environments characterized by increased sweating efficiency, circulation stability, and tolerance of high temperatures without stress. Acclimatization occurs after 7 to 10 consecutive days of exposure to heat and much of its benefit may be lost if exposure to hot environments is discontinued for a week.

2.2 **Chemical Protective Clothing (CPC)** – Apparel that is constructed of relatively impermeable materials intended to act as a barrier to physical contact of the Employee with potentially hazardous materials in the workplace. Such materials include Tyvek® coveralls (all types) and polyvinyl chloride coveralls and rain suits.

2.3 **Heat Cramps** – A form of heat stress brought on by profuse sweating and the resultant loss of salt from the body.

2.4 **Heat Exhaustion** – A form of heat stress brought about by the pooling of blood in the vessels of the skin and in the extremities.

2.5 **Heat Rash** – A heat-induced condition characterized by a red, bumpy rash with severe itching.

2.6 **Heat Stress** – The combination of environmental and physical work factors that constitute the total heat load imposed on the body.

2.7 **Heat Stroke** – The most serious form of heat stress, which involves a profound disturbance of the body's heat-regulating mechanism.

2.8 **Sunburn** – Caused by unprotected exposure to ultraviolet radiation present in sunlight that is damaging to the skin (Refer to *S3AM-121-PR1 Non-Ionizing Radiation*). The injury is characterized by red painful skin, blisters, and/or peeling.

2.9 **Unacclimated** – Employees who have not been exposed to hot work conditions for one week or more or who have become heat-intolerant due to illness or other reasons.

## 3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-004-PR1 Incident Reporting, Notifications & Investigation

3.3 S3AM-010-PR1 Emergency Response Planning

3.4 S3AM-121-PR1 Non-Ionizing Radiation

3.5 S3AM-208-PR1 Personal Protective Equipment

3.6 S3AM-209-PR1 Risk Assessment & Management

# 4.0 Procedures

## 4.1 Roles and Responsibilities

### 4.1.1 Managers

- Evaluate the need for heat illness prevention measures and incorporate as appropriate into the Safe Work Plan or Task Hazard Analysis.
- Allocate sufficient resources for the management of heat illness in the field including the provision of water, a shaded break area, and sufficient schedule to allow for breaks.

### 4.1.2 Safety, Health and Environment (SH&E) Manager

- Provide heat illness awareness training.
- Assist in developing appropriate work-rest schedules.
- Conduct/support incident investigations related to potential heat stress-related illnesses.

### 4.1.3 Supervisor

- Identify those tasks that may be most impacted by heat stress and communicate the hazard to the assigned Employees.
- Confirm that Employees have been trained on the recognition of heat illness.
- Confirm that this procedure, along with any applicable Safe Work Plan and/or Task Hazard Analysis (and heat exposure control plan that may be contained therein) are made available to affected Employees.
- Confirm that adequate supplies of appropriate fluids are readily available to Employees.
- Confirm that a proper rest area is available.
- Conduct heat illness monitoring, as applicable.
- Implement the work-rest schedule.
- Confirm that first aid measures are implemented once heat stress symptoms are identified.
- Confirm personnel are physically capable of performing the assigned tasks and are not in a physically compromised condition.
- Report all suspected heat illnesses.

### 4.1.4 Employee

- Observe each other for the early symptoms of heat illnesses.
- Maintain an adequate intake of available fluids.
- Be familiar with heat stress hazards, predisposing factors, and preventative measures.
- Report to work in a properly vested and hydrated condition.
- Report all suspected heat stress-related illnesses.

## 4.2 Restrictions

4.2.1 The Buddy System is required when working in high heat conditions; Employees shall not work alone.

4.2.2 Employees shall not be exposed to levels exceeding those specified for the given work level and work-rest regimen as listed in *S3AM-113-ATT1 Heat Stress – Temperature Thresholds*.

4.2.3 Clothing corrections shall be applied in accordance with the tables provided in *S3AM-113-ATT1 Heat Stress – Temperature Thresholds*.

4.3 Exposure Controls

4.3.1 It shall be determined whether Employees are or may be exposed to hazardous heat levels. The Supervisor shall:

- Conduct a heat stress assessment to determine the potential for hazardous exposure of Employees. Assessment shall include, but not limited to:
  - Ambient temperature.
  - Amount of sunshine (cloudy, clear). Refer to *S3AM-121-PR1 Non-Ionizing Radiation* additional direction concerning ultraviolet radiation exposures.
  - Other radiant heat sources (e.g. motor, fire, etc.).
  - Humidity.
  - Air flow.
  - Amount or type of physical labor being performed,
  - Physical condition of the Employees (e.g., acclimated/not)
  - Protective clothing in use.
  - Referral to *S3AM-113-ATT1 Heat Stress – Temperature Thresholds* to assist in determining whether hazardous heat exposures may exist.
- If potential for hazardous exposure is identified, the Supervisor shall develop and implement a heat stress exposure control plan within the Safe Work Plan and/or Task Hazard Analysis. Refer to *S3AM-209-PR1 Risk Assessment & Management.*

4.3.2 If Employees are or may be exposed, the Supervisor shall implement engineering controls (e.g., shelters, cooling devises, etc.) to reduce the exposure of Employees to levels below those specified for the given work level and work-rest regimen as listed in *S3AM-113-ATT1 Heat Stress – Temperature Thresholds*.

4.3.3 If engineering controls are not practicable, the Supervisor shall reduce the exposure of Employees to levels below those listed in *S3AM-113-ATT1 Heat Stress – Temperature Thresholds* by providing administrative controls, including a work-rest cycle or personal protective equipment, if the equipment provides protection equally effective as administrative controls.

4.3.4 If Employees are or may be exposed, the Supervisor shall provide and maintain an adequate supply of cool, fresh, potable water close to the work area for the use of a heat exposed Employee. Water shall be provided (paid) by the project or program; if Employees purchase their own drinking water because water is not otherwise available on site, they shall be reimbursed.

4.3.5 If an Employee shows signs or reports symptoms of heat stress or strain, they shall be removed from the hot environment and treated by an appropriate first aid attendant on site, if available, or by a physician, refer to *S3AM-113-ATT2 Heat Stress – Symptoms & Treatment* for more specifics.

4.4 Heat Stress Planning

4.4.1 Heat stress can be a significant site hazard, especially for Employees wearing CPC. To prepare for emergency response planning, refer to *S3AM-010-PR1 Emergency Response Planning* procedure.

4.4.2 The project and site-specific heat related risks shall be identified. Appropriate prevention and control measures shall be developed and documented in the project's SH&E Plan or included as a supplement to the SH&E Plan (e.g., *S4[DCS]AM-113-FM1 Heat Illness Prevention Plan – DCS Americas*) and the Task Hazard Assessments (THA). Refer to the *S3AM-209-PR1 Risk Assessment & Management* procedure.

4.4.3 The heat a worker is exposed to may be a combination of air temperature, radiant heat, and humidity. The WBGT (wet-bulb globe thermometer) is a useful index of the environmental

contribution to heat stress. Because WBGT is only an index of the environment, the contributions of work demands, clothing, and state of acclimatization shall also be accounted for, as described in the following steps.

- Monitor ambient temperatures and conduct heat stress monitoring in accordance with the location specific SH&E Plan. Revise the heat stress monitoring and controls if there are any reports of discomfort due to heat stress.
- Monitor temperatures in each unique environment in which workers perform work (e.g., take WBGT measurements inside truck cabs for truck drivers, and take separate WBGT measurements in the outdoor area where field employees work, etc.). Follow manufacturer's instructions on proper use of the WBGT.
- Determine if individual workers are acclimatized or un-acclimatized. Full heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the activity under those heat-stress conditions is discontinued, or when there is a sustained increase in temperatures of 10 °F (5.6 °C) or more, and a noticeable loss occurs after 4 days. A worker can be considered acclimatized for the purpose of this procedure when they have been exposed to the site conditions (including level of activity) for 5 of the last 7 days.
- Determine the approximate workload of each worker or group of workers. The following examples (Table 1) can be used for comparison:

Table 1
Examples of Activities within Workload Categories

| Categories | Example Activities |
|---|---|
| Resting | Sitting quietly |
| | Sitting with moderate arm movements |
| Light | Sitting with moderate arm and leg movements |
| | Standing with light work at machine or bench while using mostly arms |
| | Using a table saw |
| | Standing with light or moderate work at machine or bench and some walking about |
| Moderate | Scrubbing in a standing position |
| | Walking about with moderate lifting or pushing |
| | Walking on level at 3.5 miles/hr (6 km/hr) while carrying 6.6 lbs (3kg) weight load |
| Heavy | Carpenter sawing by hand |
| | Shoveling dry sand |
| | Heavy assembly work on a non-continuous basis |
| | Intermittent heavy lifting with pushing or pulling (e.g., pick-and-shovel work) |
| Very Heavy | Shoveling wet sand |



- Determine the approximate proportion of work within an hour during a typical shift. Typically, the initial work schedule will be 60 minutes of work per hour (100 percent work) with a small break in the morning and afternoon, as appropriate, and a 30-minute lunch break mid-day.
- For workers wearing cloth coveralls (e.g., Nomex fire resistant clothing), add 3 to the measured WBGT. For impermeable clothing, such as Tyvek or Saranex, the WBGT procedures cannot be used. For these situations, workers should begin physiological monitoring as soon as the temperature in the work area exceeds 70ºF (21°C).
- Use the collected information to develop appropriate work to rest schedules as detailed in *S3AM-113-ATT1 Heat Stress – Temperature Threshold*. Work-rest schedules and water provision shall be documented in the applicable SH&E Plan or supplementary Health Illness Prevention Plan and may be additionally documented using logs such *as S3AM-113-FM2 Daily Heat Illness Prevention Log*.

4.4.4 Given the work demands (light, moderate, heavy or very heavy), heat of the work environment, and such aspects as PPE in use, workload will be adjusted appropriately to allow for proper acclimation.

- This is the process by which the body "gets used to" hot work environments. This is achieved by slowly increasing workloads.
- New and returning Employees (absent one week or more) who have not had time to acclimatize may be more susceptible to heat related illnesses, even in seemingly low risk heat exposures.
- All Employees shall be allowed time to acclimatize in the event of a heat wave. All Employees assigned to a new process with additional heat exposures shall be allowed to acclimatize.
- Minimize workload and gradually increase as tolerance is built up. Allow for more frequent breaks.
- While acclimatization normally takes approximately 5 to 7 days, heightened monitoring of these Employees will be maintained for the first 14 days.

4.4.5 Employees shall be instructed in the recognition of heat stress symptoms, the first aid treatment procedures for severe heat stress, and the prevention of heat stress injuries. Employees shall be encouraged to immediately report any heat stress that they may experience or observe in fellow Employees. Supervisors shall use such information to adjust the work-rest schedule to accommodate such problems.

4.4.6 Wherever possible, a designated break area should be established in an air-conditioned space, or in shaded areas where air conditioning is impractical. The break area should be equipped to allow Employees to loosen or remove protective clothing, and sufficient seating should be available for all Employees. During breaks, Employees shall be encouraged to drink plenty of water or other liquids, even if not thirsty, to replace lost fluids and to help cool off. Cool water should be available at all times in the break area, and in the work area itself unless hygiene/chemical exposure issues prevent it.

4.5 Symptoms and Treatment

4.5.1 Refer to *S3AM-113-ATT2 Heat Stress – Symptoms & Treatment*.

4.5.2 Employees who exhibit ANY signs of significant heat stress (e.g., profuse sweating, confusion and irritability, pale, clammy skin) shall be relieved of all duties at once, made to rest in a cool location, and provided with large amounts of cool water.

4.5.3 Severe heat stress (heat stroke) is a life-threatening condition requiring immediate emergency medical care (e.g., call 911). Anyone exhibiting symptoms of heat stroke (slurred speech, unconsciousness, etc.) shall be taken immediately to the nearest medical facility. Steps shall be taken to cool the person during transportation (clothing removal, wet the skin, air conditioning, etc.).

4.6 Prevention

4.6.1 Requirements for working in extreme heat may be triggered by regulatory established criteria (e.g. CAL/OSHA requires high heat procedures when temperature equals or exceeds 95°F) or as a result of a hazard analysis assessing various contributory factors (refer to *S3AM-113-ATT1 Heat Stress – Temperature Thresholds*). Employees working in extreme heat or sun should understand and apply the following guidelines for preventing and detecting heat exhaustion and heat stroke.

- When possible, begin hydrating at least three days prior to working in high heat conditions.
- Review the heat stress exposure control plan within the SH&E Plan, and/or Task Hazard Analysis.
- If the supervisor is not immediately available confirm a reliable method of communication is in place to allow for contact with supervision. In the absence of cellular reception, a satellite phone or similar device may be required.

- Take frequent short breaks in areas sheltered from direct sunlight; eat and drink small amounts frequently.
- Try to schedule work for the coolest part of the day, early morning and evening.
- Avoid strenuous physical activity outdoors during the hottest part of the day.
- Avoid sudden changes of temperature. Refer *to S3AM-113-ATT1 Heat Stress – Temperature Thresholds*.
- Air out a hot vehicle before getting into it.
- Obtain medical direction if taking diuretics during hot weather (a lower dose may be necessary).
- When working in heat, drink 1 quart of water per hour of work.
- Avoid caffeine and alcohol as they increase dehydration.
- Monitor urine frequency and color to detect dehydration. Refer to the *S3AM-113-ATT3 Dehydration Chart.*
- The Buddy System is required when working in high heat conditions to enable effective communication and cross-observation for indications of heat stress.
- Initiate emergency response procedures when necessary, including contacting emergency medical services as appropriate and in accordance with the Emergency Response Plan.

4.6.2 Personal Protective Equipment

- Review the *S3AM-208-PR1 Personal Protective Equipment* procedure.
- Wear a hat and light-colored, loose-fitting clothing to reflect the sun.
- Apply sunscreen to exposed skin (SPF 30 or greater, follow directions on label).
- Wear sunglasses with UV protection.
- Pack extra water to avoid dehydration (try freezing water in bottles overnight to help keep the water cooler for longer during the day).

4.7 Work-Rest Schedule Practices

4.7.1 Intake of fluid will be increased beyond that which satisfies thirst, and it is important to avoid "fluid debt," which will not be made up as long as the individual is sweating.

- Two 8-ounce glasses of water should be taken prior to beginning work, then up to 32 ounces (1 quart) per hour during the work shift; fluid replacement at frequent intervals is most effective.
- The best fluid to drink is water; liquids like coffee or soda do not provide efficient hydration and may increase loss of water.
- If commercial electrolyte drinks (e.g., Gatorade) are used, the drink should be diluted with water, or 8 ounces of water should be taken with each 8 ounces of electrolyte beverage.

4.7.2 Additional salt is usually not needed and salt tablets should not be taken.

4.7.3 Fluids for drinking should be cool and fresh, but not cold.

4.7.4 Breaks will be taken in a cool, shaded location, and any impermeable clothing should be opened or removed.

- A relatively cool, shaded area shall be provided for breaks when working in hot environments. For hazardous waste sites, the rest area should be located in the support zone adjacent to the contamination reduction zone, situated so that part of it is in the decontamination area so workers can take breaks without going through full decontamination.

- If shade is not available, shaded areas shall be constructed. This same type of canopy can be set up to shade personnel performing various types of work in hot weather.
- Cooling measures other than shade (e.g., misting, air-conditioned break areas, air conditioned vehicles, etc.) can be used in lieu of shade provided it can be demonstrated that they are at least as effective in cooling employees.
- Employees should have access to these rest areas at break times and at any other time when suffering from heat illness or believing a preventive recovery period is needed.

4.7.5 Dry clothing or towels should be available to minimize chills when taking breaks.

4.7.6 Manual labor will not be performed during breaks, other than paperwork or similar light tasks.

4.7.7 Other controls that may be used include:

- Scheduling work at night or during the cooler parts of the day (6 am–10 am, 3 pm–7 pm).
- Erecting a cover or partition to shade the work area.
- Auxiliary cooling - wearing cooling devices beneath protective garments, but over any underclothing.
  - If cooling devices are worn, only physiological monitoring will be used to determine work activity.
  - These vests typically provide cooling via one of two methods: the use of ice or other frozen media, or the use of a vortex cooler. Each method has its advantages and disadvantages.
  - The frozen media vest requires a means for freezing the media, and the media (usually water or "blue ice") will melt, requiring replacement.
  - The vortex cooler tends to cool more uniformly. Instead of frozen media, this vest uses the expansion of compressed air to cool the wearer. The drawback is the compressed air requirement, but this is negated when the wearer is already using an airline respirator supplied by a compressor. A vortex cooler should not be supplied from air cylinders, as this will draw down the cylinders rapidly.
- Auxiliary cooling should be considered when the following conditions exist:
  - Ambient temperature over 80°F (26°C).
  - Workers are wearing impermeable garments (i.e., Tyvek, Saranex, Chemrel, etc.).
  - It is desirable to have long work shifts with minimum interruption.

4.8 Evaluating the Work-Rest Schedule's Effectiveness

4.8.1 Once a work-rest schedule is established, the Supervisor shall continually evaluate its effectiveness through observation of Employees for signs/symptoms of heat stress. Have workers assess themselves and their body's reaction to the heat and work conditions (self-assessment), and report any signs or symptoms of heat illness. These can include nausea or dizziness, heat cramps, extreme thirst, or very dark urine.

4.8.2 Measurement or physiological monitoring of each Employee's vitals (e.g., pulse, blood pressure, and temperature) can provide additional information in determining if the schedule is adequate. Refer to *S3AM-113-ATT1 Heat Stress – Temperature Thresholds* for additional guidance on when physiological monitoring should be conducted.

4.8.3 Frequency of physiological monitoring is increased or decreased depending upon such factors as worker fitness, acclimatization, temperature of the work environment, type of PPE, etc.

Based on the results of the physiological monitoring and on the workers' self-assessments, the work period may be adjusted as follows:

- The work period may be increased (generally, by 5- to 10-minutes intervals, up to a maximum of 4 hours) if the results of the first 2 hours of the physiological monitoring and the workers' self-assessments indicate that workers are recovering adequately (see below), and on the judgment of the SH&E Manager.
- The work period shall be decreased if the results of the physiological monitoring and the workers' self-assessment indicate that workers are NOT recovering adequately (see below).

4.8.4 If physiological monitoring is conducted, the Employee and/or the SH&E Manager (or appropriate designate) shall measure and record body temperature and pulse rate as described below.

4.8.5 Monitor body temperature to determine if Employees are adequately dissipating heat build-up. Ear probe thermometers which are adjusted to oral temperature (aural temperature) are convenient and the preferred method of measurement. Determine work/rest regimen as follows:

- Measure oral body temperature at the end of the work period. Oral body temperatures are to be obtained prior to the employee drinking water or other fluids.
- If temperature exceeds 99.6°F (37.5°C), shorten the following work period by 1/3 without changing the rest period.
- If, at the next rest period, temperature still exceeds 99.6°F (37.5°C), the worker should not be allowed to continue work until repeated temperature measurements are in the acceptable range (i.e., less than 99.6°F). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.
- Do not allow a worker to wear impermeable PPE when his/her oral temperature exceeds 100.6°F (38.1°C).

4.8.6 At the start of the workday each Employee's baseline pulse rate (in beats per minute [bpm]) is determined by taking a pulse count for 15 seconds and multiplying the result by four or by using an automated pulse count device. Pulse rates can then be measured at the beginning of each break period and two minutes thereafter to determine if the rest period allows for adequate recovery.

- Take the radial (wrist) pulse as early as possible in the rest period and determine the worker's heart rate in beats per minute. The heart rate is determined by counting the pulse for ten seconds and multiplying the number by 6 to get the beats per minute. Record this as P1.
- Wait 2 minutes and repeat the pulse measurement. Record this as P2.
- If P1 is greater than or equal to 110 beats per minute (bpm) and if (P1 – P2) is less than or equal to 10 bpm (indicating that workers are not recovering adequately), shorten the next work cycle by 1/3 without changing the rest period.
- At the next rest period, if P1 is still equal to or greater than 110 bpm, and if (P1 – P2) is still less than or equal to 10 bpm, shorten the following work cycle by 1/3 without changing the rest period.
- At the third rest period, if P1 is still equal to or greater than 110 bpm and (P1 – P2) is still less than or equal to 10 bpm, the worker should not be allowed to continue work until repeated pulse measurements are in the acceptable range (i.e., P1 is less than 110 bpm and (P1 – P2) is greater than 10 bpm). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.

4.8.7 Use of an automated or similar blood pressure device will be used to assess each Employee's blood pressure at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:

- If the blood pressure of an Employee is outside of 90/60 to 150/90, then the Employee will not be allowed to begin or resume work; extend the break period by at least five minutes, at the end of which blood pressure rates will be re-measured and the end-of-break criteria again applied.

4.8.8 All physiological monitoring of heat stress will be documented using *S3AM-113-FM1 Heat Stress Monitoring Log.*

4.9 Training

4.9.1 Employees and their Supervisors that may be exposed to the hazard will be trained and oriented to the hazard and the controls prior to work commencing.

4.9.2 Those Employees, including Supervisors, potentially exposed to heat stress will receive training, refer to the *S3AM-003-PR1 SH&E Training* procedure. Training will include, but is not limited to:

- Sources of heat stress (environmental and personal), influence of protective clothing, and importance of acclimatization;
- How the body handles heat and acclimatization;
- Recognition of heat-related illness symptoms;
- Preventative/corrective measures including, but not limited to;
  - Employees will be informed of the harmful effects of excessive alcohol consumption in the prevention of heat stress.
  - All Employees will be informed of the importance of adequate rest and proper diet in the prevention of heat stress.
- First aid procedures for heat stress-related illnesses; and
- Immediate reporting of any heat-related incident (injury, illness, near-miss), refer to the *S3AM-004-PR1 Incident Reporting, Notifications & Investigation* procedure.

## 5.0 Records

5.1 None

## 6.0 Attachments

6.1 S3AM-113-ATT1 Heat Stress - Temperature Thresholds

6.2 S3AM-113-ATT2 Heat Stress - Symptoms & Treatment

6.3 S3AM-113-ATT3 Dehydration Chart

6.4 S3AM-113-FM1 Heat Stress Monitoring Log

6.5 S3AM-113-FM2 Daily Heat Illness Prevention Log

6.6 S3[DCS]AM-113-FM1 Heat Illness Prevention Plan – DCS Americas

Americas

# Hazardous Waste Operations

S3AM-117-PR1

## 1.0 Purpose and Scope

1.1 Provides requirements for AECOM operations pertaining to hazardous waste and emergency response (HAZWOPER) services. In Canada and South America, there is no direct counterpart to HAZWOPER; however, as due diligence and in compliance with applicable duty of care/general duty clauses, staff working in Canada and South America will comply with this procedure as far as it aligns with the location's respective legislation.

1.2 Provides a procedure intended to address small incidental spills from work related equipment and supplies. For operations with bulk quantities of fuels, chemicals, oils, and for operations where AECOM is providing emergency response services for spills, the SH&E Manager or designee shall specify spill prevention and preparedness criteria including training, equipment, and proficiency.

1.3 To define appropriate procedures to decontaminate both equipment and personnel when exposure to hazardous chemicals or physical agents has occurred.

1.4 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.



## 2.0 Terms and Definitions

2.1 **Contamination Reduction Zone (CRZ)** – The transition area between the contaminated area and the clean area where decontamination activities occur.

2.2 **Decontamination** – The process of removing or neutralizing contaminants that have accumulated on personnel or equipment.

2.3 **Emergency Response** – A response effort by employees from outside the immediate release area or by other designated responders (e.g.., mutual-aid groups, local fire departments, etc.) to an occurrence that results, or is likely to result, in an uncontrollable release of a hazardous substance or whenever a release requires that a federal, state, territorial or provincial agency be notified, such as:

- A release at or above a reportable quantity (RQ) of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substance (40 CFR 302.8) is required to be reported to the National Response Center (NRC).
- A release at or above provincial reporting thresholds, if any, or alternatively those specified under the Canadian Transportation of Dangerous Goods Act are reportable under the Canadian Environmental Protection to the respective provincial or territorial Environmental Regulatory Agency .
- A hazardous chemical release at or above an RQ under the Emergency Planning and Community Right-to-Know Act (EPCRA) (Title III under the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 350-372) is required to be reported to state and local officials.
- A release in violation of a facilities Spill Prevention, Control, and Countermeasure (SPCC) Plan (40 CFR 112).

Responses to incidental release of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area or by maintenance personnel are not considered to be emergency responses within the scope of the HAZWOPER standard. Responses to releases of hazardous substances where there is no potential safety or health hazard are not considered to be emergency responses.

2.4 **Exclusion Zone (EZ)** – The area where contamination does or could occur.

2.5 **First Responder** – First responders are individuals who are likely to witness or discover a hazardous substance release, injury, fire, or other incident and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond first aid, initial control of the incident, and notifying the authorities and others of the incident.

2.6 **Hazardous Materials** – A hazardous material is any item or agent (biological, chemical, physical) that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Additionally a hazardous material may be defined as any substance or chemical which is a "health hazard" or "physical hazard," including chemicals that are carcinogens, toxic agents, irritants, corrosives, sensitizers; agents that act on the hematopoietic system; agents that damage the lungs, skin, eyes, or mucous membranes; chemicals that are combustible, explosive, flammable, oxidizers, pyrophoric, unstable-reactive, or water-reactive; and chemicals that in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapor, mists, or smoke that may have any of the previously mentioned characteristics. This may be caused when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, disposing into the environment, by being transported or moved, and items or chemicals that are "special nuclear source" or by-product materials or radioactive substances.

2.7 **Hazardous Materials Specialist** – Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician; however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with federal, state, local, and other government authorities in regards to site activities.

2.8 **Hazardous Materials Technician** – Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder in that they will approach the point of release in order to plug, patch, or otherwise stop the release of a hazardous substance.

2.9 **Hazardous Waste** – Hazardous waste is waste that is dangerous or potentially harmful to our health or the environment. Hazardous wastes can be liquids, solids, gases, or sludge. They can be discarded commercial products, like cleaning fluids or pesticides, or the by-products of manufacturing processes. Hazardous waste are divided into:

- Listed wastes (http://www.epa.gov/osw/hazard/wastetypes/listed.htm);
- Characteristic wastes (http://www.epa.gov/osw/hazard/wastetypes/characteristic.htm);
- Universal wastes (http://www.epa.gov/osw/hazard/wastetypes/universal/index.htmwastes); and
- Mixed wastes;
- Specific procedures determine how waste is identified (http://www.epa.gov/osw/hazard/wastetypes/wasteid/index.htm), classified, listed, and delisted.

2.10 **Health and Safety Plan (SH&E PLAN)** – A document prepared for each project that contains site-specific information including the Emergency Response Plan for the project.

2.11 **Incidental Releases** - A response to a spill or release of a hazardous substance (in quantities below its RQ) where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area using equipment and materials available to them at the time or the spill or release. Any spill or release that cannot be managed with the personnel, materials, and equipment at the site shall be considered an Emergency Response.

- Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses. Handling of incidental releases shall be in accordance with applicable standard operating procedures.

2.12 **Incident Command System (ICS)** – ICS is a standardized on-scene incident management concept designed specifically to allow responders to adopt an integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries. In the ICS the first person responding to an incident becomes the Incident Commander and turns that title and duties over to more qualified responders as they arrive on scene.

2.13 **Incident Commander** – The Incident Commander (IC) is responsible for all aspects of the response, including developing incident objectives and managing all incident operations. The title and responsibilities are typically assumed by a qualified IC from the client or public sector.

2.14 **Support Zone (SZ)** – An uncontaminated zone where administrative and other support functions (e.g. first aid, equipment supply, emergency information, etc.) are located.

## 3.0 References

3.1 SR1-003-WI2 Disruptive Event Response Instruction

3.2 S3AM-003-PR1 SH&E Training

3.3 S3AM-004-PR1 Incident Reporting, Notifications & Investigation

3.4 S3AM-010-PR1 Emergency Response Planning

3.5 S3AM-012-PR1 First Aid

3.6 S3AM-017-PR1 Injury & Illness Recordkeeping

3.7 S3AM-127-PR1 Exposure Monitoring

3.8 S3AM-128-PR1 Medical Screening & Surveillance

3.9 S3AM-208-PR1 Personal Protective Equipment

3.10 S3AM-209-PR1 Risk Assessment & Management

3.11 S3AM-213-PR1 Subcontractor Management

## 4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Enforces and supports the implementation of SH&E Plans, Location Specific Emergency Response Plans, and Spill Response Plans;
- Prepare or request a SH&E Plan for every AECOM project with Hazardous Waste Operations and Emergency Response Activities, refer to *S3AM-209-PR1 Risk Assessment & Management*;
- Verify that all personnel working on the project are qualified to perform the activities they are assigned (see HAZWOPER and Emergency Spill Response Training requirements below);
- Request client's emergency response procedures;
- Appoint a Site Safety Officer (SSO) with appropriate qualifications for the specific hazardous waste project;
- Confirm that the SSO for complex projects, such as those with complicated remediation activities, has no duties other than site safety and health of the field team;
- Confirm the communication of the location-specific emergency response plan details to all employees assigned to a field project;
- Authorize the procurement of the necessary decontamination supplies;

- Verify that the applicable decontamination steps are clearly defined in the approved SH&E Plan;
- Verify staff are appropriately trained to execute the defined decontamination procedures;
- Verify that adequate staffing is available to safely conduct the applicable decontamination steps;
- Confirm that the necessary communications equipment for the project is available;
- Confirm that incident investigations are performed as required and a report is filed. Refer to *S3AM-004-PR1 Incident Reporting, Notifications & Investigation*;
- During spill response, all AECOM emergency responders and their communications shall be coordinated and controlled through the Manager. The individual in charge shall implement the and shall be responsible for the following tasks:
    - Become the individual in charge at the incident until relieved by more qualified personnel;
    - Notify the appropriate agency, the AECOM incident Reporting line, and operations. Refer to *S3AM-117-ATT1 Spill Notification Numbers North America* for US and Canadian required notifications;
    - Designate a safety supervisor who is knowledgeable about the operations being implemented at the emergency response site and who will have specific responsibility to identify and evaluate hazards and to provide direction on the safety of operations for the emergency at hand. If the safety supervisor judges activities to be an Immediately Dangerous to Life or Health (IDLH) and/or to involve an imminent danger condition, the safety supervisor shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions needed to be taken to correct these hazards at the emergency scene;
    - Identify all hazardous substances or conditions present and address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance, and handling procedures;
    - Implement appropriate emergency operations. Refer to *S3AM-010-Emergency Response Planning*;
    - Limit the number of emergency response personnel at the emergency site;
    - Implement the buddy system in groups of two or more;
    - Confirm that the PPE worn is appropriate for the hazards to be encountered;
    - Implement appropriate decontamination procedures after emergency operations have terminated.
- Responsibility for the emergency response shall be transferred upon arrival of a more qualified AECOM Incident Commander or a Public Service Incident Commander.
- Confirm appropriate communications concerning an emergency event are initiated as per *S3AM-010-PR1 Emergency Response Planning* and *SR1-003-WI2 Disruptive Event Response Instruction*.

#### 4.1.2 SH&E Manager or designee

- Provide technical guidance for:
    - The development and implementation of SH&E Plans and Emergency Response Plans;
    - The Incident Commander regarding the correct way to respond to the spill;
    - Project-specific Spill Response Plans when required;

- Prepare emergency action plans as part of project SH&E Plans and emergency reference sheets;
- Interface with the local emergency responders when necessary;
- Interface with clients regarding facility emergency response procedures;
- Decide whether AECOM or an outside emergency response company will clean up the spill;
- Report spills, as necessary, to state/provincial environmental agencies;
- Review the incident report and facilitate the post-response discussion;
- Review and revise this procedure as necessary based on recommendations from post-response discussions;
- Advise Managers and Supervisors on the necessary decontamination procedures for the known or reasonably anticipated chemical hazards and physical agents associated with the planned scope of work;
- Support the project team to verify that adequate protective measures are in-place (e.g. Engineering Controls, Administrative Controls, Personal Protective Equipment, etc.).

4.1.3 **Site Safety Officer (SSO)**

- Verify that a SH&E PLAN is available for the project and is reviewed prior to the commencement of site activities;
- Conduct pre-entry briefing and daily tailgate meetings and review facility, site-specific emergency procedures, and site specific decontamination procedures;
- Communicate the site-specific emergency response details to all employees assigned to a field project;
- Establish the designated site work zones (e.g., EZ, CRZ, SZ, etc.);
- Enforce the applicable decontamination steps as defined in the approved SH&E Plan;
- Initiate Stop Work and emergency response procedures as required;
- Account for all AECOM and subcontractor employees after site evacuation;
- Brief on-site and off-site responders in the event of an emergency;
- Conduct site-specific training on the applicable decontamination steps/procedures;
- Procure the necessary decontamination supplies and establishing the decontamination line;

4.1.4 **Employees**

- Maintain HAZWOPER training, or equivalent training as it relates to the given jurisdiction;
- Follow the SH&E Plan and emergency procedures prepared for the project;
- Initiate Stop Work if necessary;
- Initiate emergency response via verbal communications or the alarm system if first to encounter an emergency;
- Follow the defined decontamination steps as stated in the approved SH&E Plan;
- Follow precautions and safe handling practices to avoid spills;
- Alert Manager to any deteriorating hazardous materials containers within the office or project area;
- Report all spills and leaks to the Manager immediately;
- Secure the spill area as quickly as possible and prevent the migration of exterior spilled materials or substances to drains or other openings; and

4.1.5 **All personnel** (e.g., AECOM employees, general laborers, equipment operators, chemists, supervisors, etc.) performing activities at hazardous waste sites that expose or potentially expose them to hazardous wastes and health hazards are considered HAZWOPER site workers and shall meet the training and medical surveillance requirements specified in 29 CFR 1910.120(e) and (f), respectively. Additional training may be required based on site activities including related exposures and risks (e.g., confined space entry, excavations, fall protection, other materials [lead], etc.). These additional training requirements are to be outlined in the project- or site-specific SH&E Plan.

4.2 Project SH&E Documentation—SH&E Plan

4.2.1 The project SH&E documentation prepared for HAZWOPER activities is referred to as a site-specific SH&E Plan, and shall meet the requirements presented in 29 CFR 1910.120(b)(4).

4.2.2 A safety and health risk or hazard analysis for each on-site task that will be performed.

4.2.3 The required SH&E Plan elements include:

- A description of the work location, the site history, and a summary of any information available concerning site hazards (including both physical hazards and contamination conditions);
- A summary of the work activities to be performed under AECOM's scope of activities;
- Identified risks shall include both chemical and physical hazards to which personnel may be exposed during the conduct of the work task;
- Protective measures for each work task to prevent or mitigate the potential hazards identified in the hazard analyses;
- Personal protective equipment (PPE) requirements for each work task**.** Refer to *S3AM-208-PR1 Personal Protective Equipment*;
- Frequency and types of air monitoring, personal monitoring, and environmental sampling techniques and instrumentation to be used;
- Site control measures;
- Decontamination procedures;
- An emergency response plan, *S3AM-010-PR1 Emergency Response Planning*, addressing actions to be taken in the event of each type of credible incident that might result during the performance of planned work activities, including minor and major injuries, and chemical release and fire. Response plans shall address the means for coordinating the evacuation of all on-site personnel in the event of a catastrophic incident.

4.2.4 Responsibility for development of each AECOM SH&E Plan will be coordinated between the Manager and the SH&E Manager or SH&E Department designee as part of project initiation. Regardless of where the SH&E Plan is developed, it will be reviewed and approved by the SH&E Manager prior to submission to any agency outside of AECOM.

4.2.5 Contractors and Subcontractors

- The health and safety of the employees of any contractor or subcontractor who does not have a contract directly with AECOM, and for whom AECOM does not have contractual safety oversight, is the responsibility of that contractor or subcontractor. The contractor or subcontractor shall evaluate the hazards and potential hazards to their own employees and shall adhere to their own Health and Safety Plan;
- Subcontractors who maintain a contract directly with AECOM shall comply with AECOM SH&E program requirements. Refer to *S3AM-213-PR1 Subcontractor Management*;
- In addition, all AECOM subcontractors' Health and Safety Plans shall, at a minimum conform to the requirements of the AECOM SH&E Plan. The AECOM SH&E Plan does not, nor is it intended to, address procedures of contractors or subcontractors during their site activities.

4.3 Personnel Qualifications— Training and Medical Surveillance

4.3.1 HAZWOPER-qualified employees shall participate in the following medical surveillance and training requirements. Medical surveillance and SH&E training requirements are further described in *S3AM-128-PR1 Medical Screening & Surveillance* and *S3AM-003-PR1 SH&E Training* respectively.

4.3.2 Employees receiving initial and refresher responder training shall be issued a certificate indicating training competency. Copies of all training records shall be maintained in accordance with the *S3AM-003-PR1 SH&E Training*.

4.3.3 Medical Surveillance

- Specific HAZWOPER medical examination protocols have been developed by AECOM's Corporate Medical Provider (CMP) to meet the requirements of 29 CFR 1910.120(f). To be medically qualified to perform HAZWOPER work, employees receive the following medical examinations:
    - Initial (Baseline) Examination — The initial examination is part of pre-employment requirements and shall be completed (with results received) prior to the employee's start of work date;
    - Annual Examination — HAZWOPER-qualified employees will complete a medical examination once each year. Medical qualification expires on the anniversary date of the last examination completed. There will be no "grace period" exemptions beyond this date without the express approval of the Region SH&E Manager. At the recommendation of the SH&E Department, the CMP may approve an alternate examination frequency at periods of up to two years (biennial) in cases in which the worker's exposures to environmental contaminants are infrequent and typically well below any occupational exposure limits (e.g., senior management personnel);
    - Termination Examination — When reassigned to non-HAZWOPER duties or at the conclusion of employment at AECOM, HAZWOPER-qualified personnel will be provided with the opportunity to receive a termination medical examination;
    - Special Examinations — The SH&E Department and the CMP will jointly determine the need for special examinations because of:
        - Unusual exposure conditions; and
        - In response to possible overexposures.
- The CMP will determine the medical protocol elements for each of these examinations based on exposure information provided by the SH&E Department. The CMP will evaluate the results of each Employee's examination and will provide a written statement of medical clearance clearly stating medical compliance with the HAZWOPER regulatory standard (29 CFR 1910.120(f)) and approval of the Employee to perform unrestricted HAZWOPER activities. For initial and annual examinations, the CMP will also evaluate the Employee for the use of air purifying and supplied air respiratory protection. The written evaluation from these examinations will indicate the CMP's approval/limitations on the Employee's use of respiratory protection;
- If an Employee does not wish to participate in part or in the complete medical surveillance program, and is permitted by the given jurisdiction, the employee shall provide a written statement of refusal. Refer to *S3AM-128-PR1 Medical Screening & Surveillance*;

4.3.4 Training - HAZWOPER

All personnel assigned to work at a hazardous waste site, sampling at Treatment, Storage and/or Disposal Facilities (TSDFs), or are performing Remediation and Investigation Activities, shall participate in training meeting the requirements of 29 CFR 1910.120(e), or equivalent training as it relates to the given jurisdiction. All personnel shall have the following training:

- 40-hour initial Training — Before being assigned to a HAZWOPER site, AECOM Employees shall complete 40 hours of off-site training meeting the requirements of 29 CFR 1910.120(e)(3)(i). At the conclusion of training, personnel will receive a written certification of course completion, signed by the instructor, that indicates the course of instruction (40-hour HAZWOPER) and training dates. A copy of this certification shall be provided to the employee's SH&E Manager. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the SSO when working on any HAZWOPER site;
- 3 days of on-the-job training — The Employee shall receive 3 days of actual supervision by a trained experienced supervisor;
- Refresher 8-Hour Training — To remain qualified to perform on-site HAZWOPER work activities, each AECOM Employee will complete 8 hours of HAZWOPER refresher training meeting the requirements of 29 CFR 1910.120(e)(8) at yearly intervals following completion of Initial 40-hour training. At the conclusion of training, personnel will receive a written certification of course completion, signed by the instructor, that indicates the course of instruction (8-hour HAZWOPER Refresher) and the training date. A copy of this certification shall be provided to the employee's SH&E Manager. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the SSO when working on any HAZWOPER site;
- 8-hour Supervisor 8-Hour Training - any AECOM Employee acting in a management capacity for HAZWOPER activities (e.g., project manager, site safety officers, etc.), including oversight of subcontractor HAZWOPER activities, shall complete an additional 8 hours of HAZWOPER Supervisor training meeting the requirements of 29 CFR 1910.120(e)(4). Although this training is required only once, supervisors shall maintain their overall HAZWOPER qualification through annual completion of refresher training. At the conclusion of Supervisor 8-Hour Training personnel will receive a written certification of course completion, signed by the instructor that indicates the course of instruction and the training date. A copy of this certification shall be provided to the SH&E Manager. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the SSO when working on any HAZWOPER site;
- 24-Hour HAZWOPER Training — Site support contractors and site visitors may qualify to substitute 24-hour HAZWOPER training in place of 40-hour training, as specified in 29 CFR 1910.120(e)(3)(ii). Personnel potentially qualifying for this alternative training include:
    - Site support personnel who will not work in any Exclusion Zone areas;
    - Subcontractors and site visitors whose duties will not entail significant exposure to site contaminants defined as not working in any areas where airborne contaminant concentrations exceed one-half of any applicable occupational exposure limit, and no contact or exposure to materials with site contaminant concentrations exceeding natural background levels. The SH&E Manager shall approve the substitution of 24-hour training for initial 40-hour training. Persons qualifying for 24-hour training shall provide written certification of course completion prior to beginning work on site. Persons completing 24-hour training shall complete 8 hours of annual refresher training at the required interval to maintain eligibility for on-site work and shall provide proof of this training (as necessary to demonstrate retraining) prior to beginning work on site.

Available Training Sources:

- On-site training provided by the SH&E Department;
- Outsourced training providers approved by the SH&E Department;

4.3.5 Training – Emergency Response

On an as-needed basis, if a project requires AECOM to provide a HAZMAT emergency response team, the following training requirements shall be met:

- Operations Level – a minimum of 8 hours of initial and refresher training for those responsible for acting defensively in the case of a release, attempting to contain the release from a safe distance;
- HAZMAT Technician – at least 24 hours of initial training and 8 hours of refresher training. They will participate in operations-level training and know how to implement the emergency response plan for the facility/site/project location;
- HAZMAT Specialist – at least 24 hours of initial training and 8 hours of refresher training. They will be trained in the same content as the HAZMAT Technician, as well as in how to develop a site safety and control plan;
- Incident Commander – will have at least 40 hours of training covering the Operations Level training and techniques for implementing the emergency response plan and directing the incident. They will be knowledgeable in relevant regulations. The Incident Commander will become the individual in charge of a site-specific incident command system and will coordinate and control communications with external agencies;

4.3.6 Subcontractor Personnel Training Records

Any subcontractor organization whose employees will support AECOM operations at a HAZWOPER site will:

- Provide the Manager with a copy of their written HAZWOPER medical surveillance and training program requirements. The elements of the program(s) shall be similar to those for AECOM's own program, as detailed above. Refer to *S3AM-213-PR1 Subcontractor Management*;
- Provide the Manager with written certification of a physician's approved medical clearance for each employee who will work on the site. Certification can be demonstrated by:
  - A copy of the physician's signed medical clearance for each employee (preferred); or
  - A letter identifying the medical status and clearance expiration date of every employee, signed by the company's safety director or an officer of the company.
  - A copy of the each employee's training certifications, which will include:
    - The initial 40-hour training certificate (24-hour training may be substituted with SH&E Manager approval);
    - The most current Refresher training certificate (shall be current within the previous one-year period);
    - A copy of the Supervisor training certificate for each person serving in a site supervisory capacity (e.g., project manager, site safety officers, etc.).

4.4 HAZWOPER and Spill Response Equipment

4.4.1 Specific HAZWOPER activity and spill response equipment shall be identified in the site specific SH&E PLAN. All AECOM offices and project sites that store chemicals at their location shall have the appropriate spill response equipment. Such equipment may include the following:

- Over-pack containers of varying capacities;
- Absorbent material such as vermiculite or commercially prepared, absorbent containing pillows, rolls, sheets, or booms;
- Acid and base neutralizing agents;
- Chemically resistant gloves for solvents, alcohols, and acids;
- Poly-coated Tyvek coveralls;
- Safety goggles;
- Respiratory protection;

4.4.2 Spill response equipment shall be placed adjacent to areas where chemicals are routinely handled, stored, and/or where shipments are received. Similar types of spill response equipment shall also be available in any AECOM vehicle or rented vehicle in which chemicals are being transported. Location of spill response equipment shall be selected to permit access outside of likely spill locations.

4.4.3 Spill Response Equipment for Field Programs

- The amount of chemicals being used during a field program will dictate the types and quantity of spill response equipment that is brought to the site;
- If several squirt bottles of decontamination solution are all that is being brought to a site, a few spill pillows and a one-gallon bucket (3.8 liters) may be sufficient to respond to a spill of these materials;
- If gallons of chemicals are being delivered to the site in drums or bulk tanks, a greater variety of spill response equipment will be needed. As indicated previously, during these types of field programs, a separate spill plan will be incorporated into the project or site specific SH&E Plan, and will provide a greater level of detail regarding the specific spill response effort for that field program. Refer to *S3AM-209-PR1 Risk Assessment & Management*;

4.5 Personal Protective Equipment (PPE) Ensembles

4.5.1 Defined HAZWOPER PPE ensembles are specified for general use on all AECOM HAZWOPER operations. The project SH&E Plan may specify modifications to these requirements to meet site-specific conditions. Refer also to *S3AM-208-PR1 Personal Protective Equipment* for additional information concerning PPE requirements.

4.5.2 Level D Ensemble

The Level D ensemble provides a minimal level of skin protection (primarily against physical rather than chemical hazards) and no respiratory protection. Level D PPE is the minimum work uniform to be used on HAZWOPER sites. Its use is appropriate when there is no significant potential for encountering hazardous substances or health hazards while working in controlled work areas.

Level D Equipment List:

- Hard hat;
- Eye protection;
- Safety-toe work boots;
- Shirts with sleeves and long pants (shorts are unacceptable for use); and
- Hearing protection (as required).

4.5.3 Modified Level D Ensemble

The Modified Level D ensemble provides moderate skin protection against contact with hazardous substances, but no respiratory protection. Its use is appropriate where there is a moderate-to-low potential for skin contact with known hazardous substances and health hazards, but no significant inhalation hazard is anticipated. The Modified Level D ensemble will consist of the Level D ensemble, supplemented by the addition of one or more of the following items:

Modified Level D Equipment List:

- Full faceshield;
- Plain (uncoated) disposable coveralls;
- Chemical-resistant disposable outer coveralls;

- Chemical-resistant outer gloves taped to outer coveralls;[1]
- Chemical-resistant inner gloves; and[1]
- Chemical-resistant safety-toe boots (taped to outer coveralls).

4.5.4 Level C Ensemble

The Level C ensemble provides moderate skin protection against contact with hazardous substances and moderate respiratory protection. Its use is appropriate where there is the potential for skin contact with known hazardous substances and health hazards, together with a limited and well-defined potential for exposure via inhalation.

Level C Equipment List:

- Full-face air-purifying respirator (APR) equipped with cartridge types as designated in the project SH&E PLAN;[2]
- Plaind (uncoated) disposable coveralls;
- Chemical-resistant disposable outer coveralls;
- Chemical-resistant outer gloves taped to outer coveralls;[3]
- Chemical-resistant inner gloves;
- Hard hat;
- Safety-toe boots taped to coveralls; the use of boot covers (e.g., booties) or chemical-resistant boots may be specified; and
- Hearing protection (as required).

4.5.5 Level B Ensemble

The Level B ensemble provides both the highest level of inhalation exposure protection and considerable skin contact protection. Its use is appropriate where there are significant known or suspected hazardous substances and health hazards, involving both skin and inhalation exposure (up to and including Immediately Dangerous to Life or Health [IDLH] conditions) or where adverse atmospheric conditions cannot be mitigated by use of air purifying respirators (e.g. oxygen deficient atmospheres or chemicals with poor warning properties). The use of Level B PPE requires prior approval by the SH&E Manager.

Level B Equipment List:

- Supplied air respirator (SCBA or airline system with Grade D or better breathing air);
- Chemical-resistant disposable outer coveralls;
- Chemical-resistant outer glove taped to outer coveralls;[3]
- Chemical-resistant inner gloves;[3]
- Hard hat;
- Chemical resistant safety-toe boots taped to coveralls; and
- Hearing protection (as required).



1 Selection of specific glove types/materials will be provided in the project SH&E Plan based on consideration of the contaminants and the physical conditions of the work.

2 Selection of specific cartridges will be made by the SH&E Department (or Competent Person – Respiratory Protection as designated by the SH&E manager) based on contaminants present. A cartridge change-out frequency will also be specified in the SH&E based on the manufacturer's cartridge performance data.

3 Selection of specific glove types/materials will be provided in the project SH&E based on consideration of the contaminants and the physical conditions of the work.

4.5.6 Level A Ensemble

The Level A ensemble provides the highest level of both respiratory and skin protection, up to and including protection against skin contact with vapor-phase contaminants. The use of Level A PPE requires prior approval by the Americas SH&E Director.

Specific Level A ensemble components will be determined on a case-by-case basis by the SH&E Department.

4.6 Emergency Response Plans

4.6.1 A Location Specific Emergency Response Plan shall be developed and implemented to handle anticipated emergencies prior to performing emergency response operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, and OSHA personnel. The plan shall be reviewed and approved by the SH&E Manager prior to issue.

4.6.2 AECOM'S *S3AM-010-PR1 Emergency Response Planning* shall apply and employees shall evacuate from the danger area whenever an emergency occurs, provided the associated contract does not require AECOM to provide emergency response services

4.6.3 AECOM Employees are not expected to take action or to participate in rescues or responses to chemical releases beyond the initial discovery of the release and immediate mitigation actions such as closing a valve, placing absorbents, and notifying the client and or public emergency response system (911).

- If AECOM Employees are to participate in the response to a chemical release beyond the initial reaction, there shall be a contractual provision for this response and the Employees shall be specifically trained for this response;
- This document is designed to provide guidelines on how to prepare a written plan that will confirm prompt and proper response to an emergency situation that arises during field investigations and to outline the duties of AECOM Employees during a field emergency and the associated training requirements.

4.6.4 Site specific SH&E plans that are prepared to comply with the HAZWOPER standard (29 CFR 1910.120) shall address emergency response. This standard specifically outlines the elements that shall be contained in an emergency response plan. However, the definition of emergency response, as written in 29 CFR 1910.120, focuses on emergencies involving the uncontrolled release of hazardous substances. Under 29 CFR 1910.120, an employer can opt to evacuate employees from the danger area when such an emergency occurs. AECOM does not expect its Employees to actively assist in the handling of uncontrollable chemical releases that may occur during the implementation of field programs. As such, and as provided by the HAZWOPER standard, AECOM is exempt from the emergency response plan requirements of the standard as long as it provides an emergency action plan within the SH&E PLAN that complies with 29 CFR 1910.38 (a). Therefore, all emergency response plans required under 29 CFR 1910.120 will be written to comply with 29 CFR 1910.38 (a).

- There are two types of emergency situations that AECOM personnel shall be prepared for and that shall be addressed in the emergency response plan. These include:
  - Emergencies related to the operations of our clients at the facility where AECOM is working;
  - Emergencies related to our own on-site activities/investigations.
- Employees are not to accept the role of Incident Commander without specific authority from the SH&E Manager and the Manager responsible for the project. Assuming the role of the Incident Commander requires training beyond the scope of this Procedure.

4.6.5 The HAZWOPER standard does not prohibit AECOM Employees from performing limited response activities.

- Appropriately trained AECOM Employees can provide voluntary First Aid services;
- AECOM Employees can provide response assistance by placing absorbent pillows or vermiculite around a small, contained spill that occurs during sampling efforts;
- Refer to Spill Response, Incidental procedures contained herein which describes the specific procedures that AECOM will follow when responding to an incidental chemical spill.

4.6.6 Field Project Preparation

- Every SH&E Plan that is prepared by AECOM will contain a Location Specific Emergency Response Plan in which the required elements of an emergency action plan will be addressed. Refer to *S3AM-010-PR1 Emergency Response Planning*;
- When AECOM is working at an operating facility, the emergency response procedures of the facility will be appended to the SH&E Plan or the Location Specific Emergency Response Plan;
- As a minimum, each emergency response plan shall contain the following topics as required by 29 CFR 1910.38 (a):
  - Procedures and contact information for reporting emergencies to public service responders and on-site (client or host employer) emergency control centers;
  - Pre-emergency planning and coordination with outside parties;
  - Emergency escape procedures and emergency escape route assignments;
  - Procedures to be followed by employees who remain to operate critical site operations before they evacuate;
  - Procedures to account for all employees after emergency evacuation is complete;
  - Rescue and medical duties for those employees who are trained to perform them;
  - Preferred means of reporting fires and other emergencies;
  - PPE to protect employees from expected exposures and potential exposures during an emergency;
  - Names of persons or departments who can be contacted for further information (i.e. emergency reference sheet);
  - Site security and control;
  - Availability of medical surveillance for workers who might have been exposed to chemicals, bloodborne pathogens, or other biological agents as a result of project work or emergency response;
  - Emergency medical treatment and first aid;
  - Emergency alerting and response procedures;
  - Critique of response and follow-up.
- In addition, each plan shall establish the specific alarm system that will be used on site to warn employees of an AECOM emergency. The chosen alarm signals should not conflict with alarm signals already in place at the facility.

4.6.7 Client Facility Emergency Response Procedures

- AECOM implements field programs on active properties, including manufacturing facilities. These facilities have typically developed an emergency response plan that is specific to facility-related emergencies. If AECOM is working at an operating facility, emergency procedures established by the facility shall be followed in the event of a facility catastrophe.

AECOM personnel shall be aware of and familiar with the alarm signals used at the facility to alert personnel to an emergency. AECOM personnel shall also know where to assemble in the event of a facility evacuation as the facility shall be able to account for all personnel, including subcontractors such as AECOM in the event of an evacuation.

- The first priority in AECOM's preparation of a project emergency action plan is to confirm that the responsibilities under the client's emergency response plan are fully understood. Because of the nature of their business, many of our clients have in-house fire brigades, medical staff, and hazardous materials teams that can assist AECOM in the event of an emergency related to our field activities. In many instances, our clients prefer or require that subcontractors seek emergency assistance through their facility first before calling outside responders to the site.
- A copy of the facility's procedures shall be made available to AECOM so that the information can be incorporated into the SH&E Plan or attached to the Location Specific Emergency Response Plan. If this information is not available to AECOM prior to arriving on site, the SSO shall meet with client representatives upon arrival to the facility to review procedures in the event of an emergency related to plant operations.

4.6.8 Escape Routes and Procedures

Although emergency evacuation procedures are included in AECOM's initial 40-hour HAZWOPER training, emergency procedures at each site will be different. Employees shall be instructed about the location specific emergency response plan. Updating training is required anytime escape routes or procedures change. An evacuation drill will be conducted for projects that are scheduled for one month or longer. Visitors and untrained employees shall not be allowed into the project area until they receive a safety briefing including evacuation alarms and procedures.

Prior to the commencement of on-site activities, the SSO shall determine how AECOM employees will evacuate each AECOM work area of the site:

- Two or more routes that are separate or remote from each other for each work area shall be identified. Multiple routes are necessary in case one is blocked by fire or chemical spill. These routes shall not overlap because, if a common point were obstructed, all intersecting routes would be blocked;
- Prominent wind direction should also be considered when designating escape routes and assembly areas. Escape routes and assembly areas should be upwind of the site whenever possible;
- Upon arrival to the site, the SSO shall verify that the selected routes are appropriate for evacuation. During an emergency, the quickest and most direct route should be selected. However, when working at an operating facility, the established escape routes of the facility should be used whenever possible;
- In the event of a facility-related emergency, all AECOM employees shall meet at the facility's assembly area so that the client can verify that AECOM has evacuated the property.

4.6.9 Alarm Signals

An emergency communication system shall be in effect at all sites.

- The most simple and effective emergency communication system in many situations will be direct verbal communications. However, verbal communications shall be supplemented any time voices cannot be clearly perceived above ambient noise levels and any time a clear line of sight cannot be easily maintained among all AECOM personnel because of distance, terrain, or other obstructions;
- Portable two-way radio communications may be used when employees shall work out of the line of sight of other workers;
- When it is necessary to supplement verbal communications, Employees shall be informed of the established emergency signals. The following emergency signals, or other appropriate signals, shall be implemented using handheld portable air horns, whistles, or similar devices.

Signals shall be capable of being perceived above ambient noise by all employees in the affected portions of the workplace:

- One Blast: General Warning—A relatively minor and localized, yet important, on-site event. An example of this type of an event would be a minor chemical spill where there is no immediate danger to life or health yet personnel working on the site should be aware of the situation so that unnecessary problems can be avoided. If one horn blast is sounded, personnel shall stop all activity and equipment on-site and await further instructions from the SSO;
- Three Blasts: Medical Emergency—A medical emergency for which immediate first aid or emergency medical care is required. If three horn blasts are sounded, all First Aid Providers should respond as appropriate. All other activity and equipment should stop and personnel should await further instructions from the SSO;
- Three Blasts Followed by One Continuous Blast: Immediate Threat to Life and Health — A situation that could present an immediate danger to life and health of personnel onsite. Examples include fires, explosions, large hazardous chemical release, severe weather-related emergencies, or security threats. If three horn blasts followed by a continuous blast are sounded, all activity and equipment shall stop. All personnel shall evacuate the site and meet in the designated assembly area where the SSO will account for all employees. The SSO will arrange for other emergency response actions if necessary. Information concerning the need to follow decontamination procedures during an emergency evacuation will be addressed in the Location Specific Emergency Response Plan;

- The SSO or his designate will acknowledge the distress signal with two short blasts on the air-horn or whistle;
- One Continuous Blast Following Any of the Above: All Clear/Return to Work — Personnel who sound the initial alarm are required to send an all clear signal when the emergency is over.

4.6.10 Accounting Method for All Employees after Evacuation

The SSO is responsible for determining that all AECOM employees have been successfully evacuated from the work area(s):

- It is the responsibility of each AECOM subcontractor to verify that all of its employees evacuated the site and to report this information to the SSO. All employees shall meet at the designated assembly area;
- A headcount is an acceptable way to determine complete evacuation when the field team is of a small size. The site log-in book or equivalent should be referenced when attempting to account for more than 10 people. In the event of a facility-related emergency, the SSO shall notify facility representatives that all AECOM employees and AECOM subcontract employees have successfully evacuated the work area(s);
- The SSO shall notify emergency responders if any employee is unaccounted for and where on the site they were last seen;
- In the event of a project-related emergency, the SSO will provide off-site emergency responders or on-site HAZMAT teams or fire brigades (Incident Commander) with all available knowledge about the emergency situation upon their arrival to the scene.

4.6.11 Employees Who Remain to Operate Critical Site Operations Before They Evacuate

All equipment and operations are required to cease in accordance with the established alarm signal procedures. The only exception will be related to health and safety:

- The SSO shall determine at the time of the emergency if health and safety will be jeopardized by immediate stoppage of any particular piece of equipment;

- If such a determination is made, personnel involved in critical operations shall be minimized. Once it is determined that the operation is no longer needed or the threat to the operators is imminent, operations will cease and the operators will immediately evacuate.

4.6.12 Rescue and Medical Response

- Only currently trained individuals will administer first aid, CPR or an AED. Refer to *S3AM-012-PR1 First Aid*.
- In the event of an incident, refer to material's SDS labels to confirm proper first aid is administered for the hazardous material and call the nearest Poison Centre or 911. Refer to *S3AM-012-PR1 First Aid*.
    - The American National Standards Institute (ANSI) Standard for Emergency Eyewash and Shower Equipment (ANSI Z358.1-1998) recommends that the affected body part shall be flushed immediately and thoroughly for at least 15 minutes using a large supply of clean fluid under low pressure. However, other references recommend a minimum 20-minute flushing period if the nature of the contaminant is not known. The flushing or rinsing time can be modified if the identity and properties of the chemical are known. For example, at least:
        - 5 minutes flushing time for mild irritants;
        - 20 minutes for moderate to severe irritants;
        - 20 minutes for non-penetrating corrosives;
        - 60 minutes for penetrating corrosives;
        - If irritation persists, repeat the flushing procedure.
- It is important to note that ingestion of any chemical is not likely to occur in the workplace. If ingestion does occur, evidence indicates that inducing vomiting is not necessary in most situations where there has been an occupational chemical ingestion.
    - Induction of vomiting should only be recommended if the chemical has very high, short-term (acute) toxicity, and medical follow-up is not readily available;
    - In these cases, first aiders should receive special training on how to safely and effectively induce vomiting in the appropriate circumstances.
- If the injury is life threatening, the Emergency Medical System (EMS) should be called (911). Depending on the procedures established for the project, the SSO would contact an emergency responder directly or notify the facility representatives for medical assistance;
- If the employee needs medical attention that cannot be provided on-site, the SSO shall escort the individual to the local hospital identified on the emergency reference sheet and shall remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the Manager and SH&E Manager.

4.6.13 On-site and Off-site Communications

Regardless of the size or location of AECOM's field projects, it is extremely important that both on-site and off-site communications be maintained so that in the event of an emergency employees can contact each other or place a phone call immediately with the appropriate responder(s).

A reliable and approved form of communication (e.g. two way radio, cell phone, etc.) is required when members of the field team are working in separate areas of the site and verbal communications are no longer effective because of distance. A communication device shall be available for each team that is working in a separate area of the site.

When AECOM is working at an occupied facility, a telephone may be accessible. When AECOM is working on abandoned properties or when there is no access to a phone, as appropriate, a cellular telephone, two-way radio, or satellite telephone shall be brought to the work location.

4.6.14 Preferred Means of Reporting

Employees shall immediately notify the Supervisor of incidents and emergencies, and report in accordance with *S3AM-004-PR1 Incident Reporting, Notification & Investigation*:

- Unless facility representatives specifically indicate that they prefer AECOM personnel to notify them first of an emergency, the SSO will directly contact the appropriate emergency responders listed on the Location Specific Emergency Response Plan;
- Additional communications within AECOM concerning an emergency event may be required as per *S3AM-010-PR1 Emergency Response Planning* and *SR1-003-WI2 Disruptive Event Response Instruction*;
- "Dangerous occurrences" shall be reported immediately to the police, employer, vehicle owner/leaser and the dangerous goods owner. Such events would include spills, bulk container damage, fire, explosion, and transportation accidents involving dangerous goods;
- Confirm and seek direction on external reporting requirements. Each jurisdiction has regulations governing the minimum quantities for reporting based on the type of product spilled or release refer to *S3AM-117-ATT1 Spill Notification Numbers for North America*;

Individuals who have knowledge of a spill, release, or unlawful discharge, shall notify authorities immediately. Reporting does not imply guilt or assign blame. The following details are to be reported:

- Location and time of spill;
- Description of circumstances leading to spill;
- Type and quantity of material or substance spilled;
- Details of any action taken at the site of the spill;
- Description of location of spill and immediately surrounding the area;
- Any additional information in respect of the spill that the Minister, Environmental Protection Officer or person designated by regulations requires.

4.6.15 First Responder

First responders shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

- An understanding of what hazardous substances are, and the risks associated with them in an incident;
- An understanding of the potential outcomes associated with an emergency;
- The ability to recognize the presence of hazardous substances and physical hazards in an emergency;
- An understanding of the role of the first responder;
- The ability to realize the need for additional resources and to make appropriate notifications to the communication center.

4.6.16 First Responder HAZWOPER Operations Level

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release:

- They are trained to respond in a defensive fashion without actually trying to stop the release; Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures;

- First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:
    - Knowledge of the basic hazard and risk assessment techniques;
    - Know how to select and use proper personal protective equipment provided to the first responder operational level;
    - An understanding of basic hazardous materials terms;
    - Know how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit;
    - Know how to implement basic decontamination procedures;
    - An understanding of the relevant standard operating procedures and termination procedures;

4.6.17 Hazardous Materials Technician

Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

- Know how to implement the employer's emergency response plan;
- Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment;
- Be able to function within an assigned role in the Incident Command System, refer to *Federal Emergency Management Agency—FEMA: Incident Command System*;
- Know how to select and use proper specialized chemical PPE provided to the hazardous materials technician;
- Understand hazard and risk assessment techniques;
- Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit;
- Understand and implement decontamination procedures;
- Understand termination procedures;
- Understand basic chemical and toxicological terminology and behavior.

4.6.18 Hazardous Materials Specialist

Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

- Know how to implement the local emergency response plan;
- Understand classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment;
- Know the state or applicable jurisdictional emergency response plan;
- Be able to select and use proper specialized chemical PPE provided to the hazardous materials specialist;
- Understand in-depth hazard and risk techniques;
- Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available;

- Be able to determine and implement decontamination procedures;
- Have the ability to develop a site safety and control plan;
- Understand chemical, radiological, and toxicological terminology and behavior.

4.7 Decontamination Procedures

4.7.1 When possible, all necessary steps shall be taken to reduce or minimize contact with chemicals and impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment over, tracking, or splashing potential or known impacted materials).

4.7.2 All personal decontamination activities shall be performed with an attendant (buddy) to provide assistance to personnel that are performing decontamination activities. An attendant may not be required for Level D equipment removal and decontamination. Depending on specific site hazards, attendants may be required to wear a level of protection that is equal to the required level in the exclusion zone.

4.7.3 All persons and equipment entering the EZ shall be considered contaminated, and thus, shall be properly decontaminated prior to entering the SZ. No equipment, including personal protective equipment or contaminated clothing shall be taken or worn into the SZ.

4.7.4 Decontamination procedures may vary based on site conditions and nature of the contaminant. If chemicals or decontamination solutions are used, care should be taken to minimize reactions between the solutions and contaminated materials. In addition, personnel shall assess the potential exposures created by the decontamination chemical(s) or solutions. The safety data sheets shall be reviewed, implemented, and filed by personnel contacting the chemicals/solutions.

4.7.5 All contaminated personal protective equipment (PPE) and decontamination materials shall be stored and disposed of in accordance with site-specific requirements identified in the approved work plan.

4.7.6 For all Level A and B ensembles, adequate supplied air shall be available to allow the employee to safely complete all necessary decontamination steps.

4.7.7 Where decontamination procedures involving radioactive materials are required, the removable limits for both personnel and equipment will be specified by a Certified Health Physicist or Certified Industrial Hygienist in the project's approved Radiation Protection Plan or approved safety planning document.

4.7.8 Materials Needed to Decontaminate Personnel and/or Equipment

- The equipment required to perform decontamination may vary based on site-specific conditions and nature of the contaminant(s). The following equipment is commonly used for decontamination purposes:
  - Soft-bristle scrub brushes or long-handled brushes to remove contaminants;
  - Hoses, buckets of water or garden sprayers for rinsing;
  - Large plastic/galvanized wash tubs or children's wading pools for washing and rinsing solutions;
  - Large plastic garbage cans or similar containers lined with plastic bags for the storage of contaminated clothing and equipment;
  - Metal or plastic cans or drums for the temporary storage of contaminated liquids;
  - Paper or cloth towels for drying protective clothing and equipment; and
  - Poly or plastic sheeting to lay down and form the base for the CRZ, as well as to contain contaminants and decontamination fluids.

4.7.9 Personal Decontamination Steps

- The decontamination plan shall be in writing and shall specify the exact steps in either wet or dry decontamination or personnel exiting the EZ to the SZ. The decontamination plan shall also address respirator cartridge change out, SCBA bottle changes and equipment decontamination.

4.7.10 Decontamination Steps during a Medical Emergency

- If decontamination can be done:
  - Wash, rinse and/or cut off protective clothing and equipment.
- If decontamination cannot be done:
  - Wrap the victim in blankets, plastic sheeting, or rubber to reduce contamination of other personnel;
  - Alert emergency and offsite medical personnel to potential contamination;
  - Instruct them about specific decontamination procedures if necessary;

4.7.11 Equipment Decontamination Steps

- All equipment leaving the EZ shall be considered contaminated and shall be properly decontaminated to minimize the potential for exposure and off-site migration of impacted materials. Such equipment may include, but is not limited to: sampling tools, heavy equipment, vehicles, PPE (hoses, cylinders, etc.), and various handheld tools;
- All Employees performing equipment decontamination shall wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of protection required in the EZ. Other PPE may include splash protection, such as face-shields and splash suits, and knee protectors. Following equipment decontamination, Employees may be required to follow the proper personal decontamination procedures above;
- For larger equipment, a high-pressure washer may need to be used. Some contaminants require the use of a detergent or chemical solution and scrub brushes to confirm proper decontamination. Personnel operating a high pressure washer will be trained in the operation of the equipment and follow the manufacturer's operational instructions;
- For smaller equipment, use the following steps for decontamination:
  - Remove majority of visible gross contamination in EZ;
  - Wash equipment in decontamination solution with a scrub brush and/or power wash heavy equipment;
  - Rinse equipment;
  - Visually inspect for remaining contamination;
  - Follow appropriate personal decontamination steps outlined above.
- All decontaminated equipment shall be visually inspected for contamination prior to leaving the CRZ. Signs of visible contamination may include an oily sheen, residue or contaminated soils left on the equipment. All equipment with visible signs of contamination shall be discarded or re-decontaminated until clean. Depending on the nature of the contaminant, equipment may have to be analyzed using a wipe method or other means.

4.8 Employee Exposure Monitoring

4.8.1 Explosive levels, oxygen levels, and airborne contaminants may present potential hazards to HAZWOPER personnel working within controlled work areas and to non-HAZWOPER workers and the general public present outside the controlled work areas.

4.8.2 As appropriate, exposure monitoring at HAZWOPER sites will be conducted to determine explosive and oxygen levels, monitor and control employee exposures to airborne contaminants, and to determine and regulate controlled work area boundaries (e.g., support zone, contamination reduction zone, and exclusion zone) for the protection of non-HAZWOPER workers and the general public.

4.8.3 Specific exposure monitoring requirements will be established in individual SH&E Plans. Refer to *S3AM-127-PR1 Exposure Monitoring*. All monitoring efforts using direct reading instruments and will remain part of the project file.

4.8.4 Work Area Exposure Monitoring

- Work area exposure monitoring will include breathing zone readings for the maximum exposed worker(s);
- Results will be used to determine adequacy of PPE (especially respiratory protection). Specific criteria for upgrade/downgrade will be established in the SH&E Plan.

4.8.5 Perimeter Exposure Monitoring

- Perimeter air samples will be collected when the potential exists for airborne contaminants to migrate off-site and will be collected near the work zones when performing work at an active client facility. Refer to *S3AM-127-PR1 Exposure Monitoring*;
- Perimeter exposure monitoring will be conducted at locations downwind from the project activities at a minimum (also upwind if the potential exists for offsite contamination to migrate onto the site).

4.8.6 Exposure results will be posted on site and explained in a safety briefing.

4.8.7 Employees will receive a written statement of results within 15 days of receipt from the laboratory.

4.8.8 Results of all personal exposure monitoring will be provided to the SH&E department for inclusion in the employee medical records, refer to *S3AM-017-PR1 Injury & Illness Recordkeeping*.

## 5.0 Records

5.1 All forms and documents generated during a HAZWOPER project will be maintained in the project file.

5.2 All medical screening and surveillance documentation shall be retained for 30 years.

## 6.0 Attachments

6.1 S3AM-117-ATT1 Spill Notification Number for North America

Americas

# Hearing Conservation

S3AM-118-PR1

## 1.0 Purpose and Scope

1.1 Establishes procedures to confirm that personal noise exposure remains within acceptable limits and establishes the requirements of an acceptable hearing conservation program.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

## 2.0 Terms and Definitions

2.1 **ABC System** – The system used in Canada to classify hearing protectors on the basis of the attenuation provided by the hearing protection.

2.2 **Action Level** – May also be referred to as **Monitoring Level**. An eight-hour, time-weighted average established by the applicable jurisdiction, measured on the A-scale, slow response. Depending upon jurisdiction, this can vary anywhere from 74dBA to 85dBA, and may additionally be defined as 50% of the allowable noise dose. In the absence of a specified jurisdictional action level, 85dBA shall be used as the default action level.

2.3 **Attenuation –** The reduction of the sound level at the ears of a person wearing hearing protectors.

2.4 **Decibel (dB)** – Logarithmic unit of measurement of sound level.

2.5 **Established Exposure Limit** – The maximum regulatory noise exposure to which an individual may be exposed to for an 8- hour time weighted average (TWA).

- This limit is referred to by different terminology depending upon the given jurisdiction (e.g. Permissible Exposure Limit (PEL), Contamination Limit, Occupational Exposure Limit (OEL), Threshold Limit Value (TLV), etc.).
- Acceptable methods of adjusting this limit to correspond to a different exposure period (e.g. 10 hours) vary by jurisdiction.

2.6 **Standard Threshold Shift (STS)** – When one's hearing threshold has changed (relative to the baseline audiogram) an average of 10 dB or more at 2000, 3000, or 4000 Hz in either ear).

2.7 **Noise Reduction Rating (NRR)** – The measure, in decibels, of how well a hearing protector reduces noise (attenuation), as specified by the United States of America Environmental Protection Agency. It is a requirement in the USA that all hearing protectors have the NRR stamped on their packaging.

2.8 **Time-Weighted Average (TWA) Sound Level** – That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured.

## 3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-127-PR1 Exposure Monitoring

3.3 S3AM-128-PR1 Medical Screening & Surveillance

## 4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **SH&E Manager**

- Provide access to initial and refresher hearing conservation training.

- Inform employees of noise monitoring results when full-shift noise exposure is at or above the action level.
- Designate areas and tasks where employees' exposure is at or above the action level.
- Conduct noise monitoring and supervise noise surveys, as applicable, and support hazardous noise assessment/evaluation efforts.

4.1.2 **Manager**

- Implement the hearing conservation program.
- Confirm that a hazardous noise assessment/evaluation has been conducted.
- Confirm that a hazardous noise assessment/evaluation is conducted when a change in equipment, procedures, or personnel may increase employee exposure to noise.
- Implement engineering controls to reduce noise levels when such measures are considered feasible and when required by regulation.
- Purchase, monitor, and replenish for employees' use, a supply of hearing protection devices with a minimum Noise Reduction Rating (NRR) of 26 dBA, or of the appropriate classification for the applicable jurisdiction.
- Confirm that individuals included in the program receive training and that the training meets the criteria outlined in this program.
- Investigate and implement corrective action to all reports of non-conformance with this procedure, including reports of standard threshold shifts or employees' failure to wear hearing protectors in designated areas.
- Maintain an awareness of the noise levels in work areas for which he/she is responsible.
- Place warning signs in areas where sound levels would require the use of hearing protectors.
- Request that a hazardous noise assessment/evaluation be conducted when a change in equipment, procedures, or personnel may increase employee exposure to noise above action levels.
- Confirm that all employees are aware of the requirements for hearing protection for any designated area or task.
- Enforce the use of hearing protection by employees in designated areas and for designated tasks.

4.1.3 **Employee**

- Comply with the requirements of the Hearing Conservation program.
- Wear hearing protection devices in designated areas or for designated tasks.
- Inspect and maintain hearing protection devices.
- Report any suspected change in noise levels of work area to supervisor.
- Report any signs or symptoms experienced that could be the result of overexposure to noise to supervisor.
- Participate in audiometric testing and hearing protection training when required.

4.2 General Requirements

4.2.1 The requirements of this procedure apply to all locations/facilities/projects where employee noise exposure may equal or exceed the action level.

4.2.2 SH&E Plans and Task Hazard Assessments (THA) shall identify applicable hazards related to noise exposure. Identify established exposure limits and action levels specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 dBA.

- The below chart is intended to provide basic established exposure limits by jurisdiction. Please consult the applicable jurisdictional legislation to obtain further information and to verify accuracy.

| | 8hr TWA Established Exposure Limit (dBA) | 8hr TWA Action Level (dBA) |
|---|---|---|
| OSHA | 90 | 85 |
| Canada - Federal | 87 | 74 |
| Alberta | 85 | 85 |
| British Columbia | 85 | 82 |
| Manitoba | 85 | 80 |
| New Brunswick | 85 | 80 |
| Newfoundland | 85 | 85 |
| Northwest Territories | 85 | 80 |
| Nova Scotia | 85 | 85 |
| Nunavut | 85 | 85 |
| Ontario | 85 | 85 |
| Prince Edward Island | 85 | 85 |
| Quebec | 90 | 85 |
| Saskatchewan | 85 | 80 |
| Yukon | 85 | 80 |

- Acceptable methods of adjusting this limit to correspond to a different exposure period (e.g. 10 hours) vary by jurisdiction.

4.2.3 When processes or areas present noise exposures that are or could be at or above the action level identified for the given jurisdiction, monitoring and interpretation of results shall be undertaken by a trained and competent individual using approved equipment (sound level meters, sound dosimeters) to assess the hazard.

4.2.4 Resulting documentation (e.g. noise maps, results of the sound level survey data, etc.) will be posted at the location.

4.2.5 Noise assessments shall be repeated when there is any change in processes or equipment that could affect the noise level or the exposure duration.

4.2.6 Eliminate noise sources or reduce noise levels to the extent possible prior to implementing hearing protection PPE. Examples of controls that shall be considered include:

- Adding or replacing mufflers on motorized equipment.
- Adding mufflers to air exhausts on pneumatic equipment.
- Following equipment maintenance procedures to lubricate dry bearings and replace worn or broken components.
- Isolating loud equipment with barriers.
- Replacing loud equipment with newer and quieter models.
- Using caution signs and Hearing Protection Required signs to designate noisy work areas.
- Installing hearing protection device-dispensing stations at the entrance to noisy work areas.

4.2.7 Where practicable, a clearly visible warning sign shall be posted at every approach to an area in the workplace where the sound level regularly exceeds 85 dBA.

4.3 Hearing Protectors

4.3.1 Hearing protectors will be used in the event that administrative or engineering controls are either not effective or not feasible.

4.3.2 Selection of appropriate hearing protectors shall be based on actual or anticipated exposure levels, the attenuation provided by the device, and the manufacturer's information about the use and limitations of the device.

4.3.3 At a minimum, hearing protectors shall provide a level of protection that brings actual or anticipated exposure below the established exposure limit for the applicable jurisdiction. Additional information relative to hearing protector use is as follows:

- The use of hearing protectors is required in any location where powered or motorized equipment, portable tools or any other noise source could reasonably be expected to exceed noise levels specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 dBA.
- Hearing protection will be mandatory for all employees working in any area that has not been evaluated for noise exposure and the ambient noise level in the area is such that a raised voice is necessary to have a normal conversation with someone less than three feet (1 meter) away, and/or when within 25 feet (7.6 meters) of an operating piece of heavy equipment.
- Hearing protection will be mandatory for all employees who work on or near heavy equipment unless personal dosimetry or other techniques have been used to document actual exposure.
- Hearing protectors will be made available to all employees at no cost to the employees who may be exposed to noise levels specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 dBA.
- Hearing protection will be mandatory for all employees exposed to 85 dBA for any period of time and who have experienced an STS.
- Whenever information indicates that any employee's exposure may equal or exceed specified levels (or as applicable, an 8-hour TWA of 85 dBA), the manager will be responsible for enforcing the proper use of hearing protectors.
- At least two types of hearing protectors shall be available to employees free of charge, and the type of hearing protector shall be suitable to the task and approved to the applicable jurisdiction.
- Hearing protectors shall be used in accordance with manufacturer's specifications to effectively protect hearing. Refer to *S3AM-118-ATT1 Hearing Protection Guidelines*.

4.3.4 Evaluate the effectiveness of the hearing protectors chosen.

4.3.5 The manufacturer's assigned noise reduction rating (NRR) or attenuation for hearing protection devices can seldom be achieved in workplace conditions; therefore this rating shall be adjusted for real world conditions and use.

- For devices with an NRR rating, subtract 7 from the NRR of the protector provided by the manufacturer. Divide this result by 2, and then subtract the remained from the observed "A" scale sound level measurement collected in the employee's work area (see Section 4.B). If this number is below 85, the hearing protectors are adequate for use in the work area.

4.3.6 Implement a hearing conservation program as applicable and in accordance with jurisdictional requirements

4.4 Training

4.4.1 All employees with potential exposure above the action levels applicable to their jurisdiction, or who otherwise utilize any type of hearing protector will participate in a hearing conservation training program. Refer to *S3AM-003-PR1 SH&E Training*.

4.4.2 The initial and subsequent annual hearing conservation training will address, at a minimum, the following topics:

- The effects of noise on hearing, recognizing hazardous noise, and symptoms of overexposure to hazardous noise.
- When and/or where hearing protectors are required to be worn.
- The purpose of hearing protectors.
- The advantages, disadvantages, and effectiveness of various types of protectors.
- Instructions on care and use of hearing protectors, including its limitations, proper fitting, inspection and maintenance and, if applicable, the cleaning and disinfection of the protector.
- The purpose of audiometric testing, including an explanation of the test procedures.
- Hearing Conservation Program requirements and responsibilities.

4.4.3 Hearing protection training is conducted annually for all affected employees or more frequently for employees who do not properly use hearing protectors or otherwise fail to comply with this policy.

4.5 Audiometric Testing

4.5.1 All AECOM personnel with exposure greater than the action level shall be enrolled in the medical surveillance program and undergo a baseline audiogram within 6 months of the first exposure (consult local jurisdiction for more stringent timelines).

4.5.2 Thereafter, annual audiograms will be compared with the baseline exam. Testing to establish a baseline audiogram will be preceded by 14 hours without exposure to noise, including noise exposure away from work. Hearing protectors may be used as a substitute for the requirement that a baseline audiogram will be preceded by 14 hours without exposure to noise.

4.5.3 Enrolled employees will receive audiograms during their exit physicals; refer to *S3AM-128-PR1 Medical Screening & Surveillance Program.*

- Audiometric tests will be performed by a person meeting the requirements specified by the applicable jurisdiction.
- The medical surveillance provider will notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.
- For multi-year projects, an annual audiogram will be obtained for each employee exposed at or above the level specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 decibels.

4.5.4 Each employee's annual audiogram will be compared to that employee's baseline audiogram to determine if the audiogram is valid, and if there is a standard threshold shift (STS).

4.5.5 When a Standard Threshold Shift (STS), as identified by the AECOM Medical Consultant, is noted between the last valid baseline and the annual audiogram, the following steps will be taken:

- A retest will be conducted within 30 days to confirm the STS. The employee will not be exposed to workplace/hobby noise for 14 hours or will be provided with adequate hearing protection prior to testing.
- If the STS persists, ear protection will be evaluated and refitted, and may be upgraded to one with a greater NRR or classification. The hearing protection will have a minimum NRR of 26 dBA, or be of the appropriate classification for the applicable jurisdiction.
- The employee will be counselled and AECOM will obtain information regarding the employee's possible noise exposure away from the workplace or existing ear pathology.
- Qualified medical personnel will review the audiograms. This group will determine the need for a medical referral.

- The employee will be notified in writing by either the **SH&E Manager** or the AECOM Medical Provider of the STS, within 21 days of determination, or as required by the applicable jurisdiction.
- The employee's supervisor will be notified of the shift in hearing threshold.

4.5.6 An employee who has experienced an STS shall comply with any recommendations made by medical personnel as they relate to the employees assigned work duties (e.g. dual hearing protection of earplugs and earmuffs).

4.6 Employee Monitoring

4.6.1 When information indicates that any employee's exposure may equal or exceed the applicable action level, the SH&E Manager shall develop and implement a site-specific monitoring program to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors. Refer to *S3AM-118-FM1 Site-Specific Hearing Conservation Program* and *S3AM-127-PR1 Exposure Monitoring*.

4.6.2 Noise surveys shall be conducted in a manner that reasonably reflects the exposure of the affected employees. Surveys shall be conducted under the supervision of an AECOM SH&E Manager. Refer to *S3AM-118-FM2 Sound Level Survey* and *S3AM-118-FM3 Noise Dosimetry Record*.

4.6.3 Sound-level meters and audio dosimeters used to determine employee exposure to noise sources shall be Type II (accurate to within +/- 2 dBA), operated in “slow” response, on the “A” scale, and be calibrated to factory guidelines (including periodic factory recalibration).

## 5.0 Records

5.1 Noise exposure measurement records, surveys and Site-Specific Hearing Conservation Plans will be retained at the project/facility for the duration of the project.

5.2 Audiogram records will be retained in the employee’s medical records as per *S3AM-128-PR1 Medical Screening & Surveillance Program*.

5.3 Employee training session documentation will be retained in accordance with *S3AM-003-PR1 SH&E Training*.

## 6.0 Attachments

6.1 S3AM-118-ATT1 Hearing Protection Guidelines

6.2 S3AM-118-FM1 Site-Specific Hearing Conservation Program

6.3 S3AM-118-FM2 Sound Level Survey

6.4 S3AM-118-FM3 Noise Dosimetry Record

Americas

# Flammable & Combustible Liquid Classifications

S3AM-126-ATT1

## NFPA 30, WHMIS Canada

| Flammable Liquid | Flash Point | Boiling Point |
|---|---|---|
| Class 1A | < 73° F (22.8°C) | < 100° F (37.8°C) |
| Class 1B | < 73° F (22.8°C) | > 100° F (37.8°C) |
| Class 1C | > 73° F (22.8°C) < 100° F (37.8°C) | |
| **Combustible Liquid** | | |
| Class 2 | > 100° F (37.8°C) < 140° F (60°C) | |
| Class 3A | ≥ 140° F (60°C) <200°F (93.3°C) | |
| Class 3B | >200°F (93.3°C) | |

Do not store more than 25 gallons (95 liters) of Class IA liquids in containers of" flammable or combustible liquids outside of an approved storage cabinet.

Do not store more than 120 gallons (454 liters) of Class IB, IC, II, or III liquids in containers of flammable and combustible liquids in a single flammable storage cabinet.

### Maximum Allowable Size of Containers and Portable Tanks

| Container Type | Flammable Liquids | | | Combustible Liquids | |
|---|---|---|---|---|---|
| | Class 1A | Class 1B | Class 1C | Class II | Class III |
| Glass or approved plastic | 1 pint (0.5 liter) | 1 quart (1 liter) | 1.3 gallons (5 liters) | 1.3 gallons (5 liters) | 1.3 gallons (5 liters) |
| Metal (other than drums) or approved plastic | 1.3 gallons (5 liters) | 5.3 gallons (20 liters) | 5.3 gallons (20 liters) | 5.3 gallons (20 liters) | 5.3 gallons (20 liters) |
| Safety cans | 2.6 gallons (10 liters) | 5.3 gallons (20 liters) | 5.3 gallons (20 liters) | 5.3 gallons (20 liters) | 5.3 gallons (20 liters) |
| Metal drums (DOT specifications) | 119 gallons (450 liters) | 119 gallons (450 liters) | 119 gallons (450 liters) | 119 gallons (450 liters)) | 119 gallons (450 liters) |
| Approved metal portable tanks | 793 gallons (3,002 liters) | 793 gallons (3,002 liters) | 793 gallons (3,002 liters) | 793 gallons (3,002 liters) | 793 gallons (3,00 liters) |

## OSHA 29 CFR 1910.106

| Flammable Liquid | Flash Point | Boiling Point |
|---|---|---|
| Category 1 | < 73.4° F (23°C) | < 95° F (35°C) |
| Category 2 | < 73.4° F (23°C) | > 95° F (35°C) |
| Category 3* | > 73.4° F (23°C) < 140° F (60°C) | |
| Category 4** | >140°F (60°C) ≤199.4°F (37.8°C) | |

* When a Category 3 liquid with a flashpoint at or above 100 °F (37.8 °C) is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100 °F (37.8 °C).

** When a Category 4 flammable liquid is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100 °F (37.8 °C).



### Maximum Allowable Size of Containers and Portable Tanks

| Container Type | Flammable Liquids | | | |
|---|---|---|---|---|
| | Category 1 | Category 2 | Category 3 | Category 4 |
| Glass or approved plastic | 1 pint (0.5 liter) | 1 quart (1 liter) | 1 gallons (3.8 liters) | 1 gallons (3.8 liters) |
| Metal (other than drums) or approved plastic | 1 gallons (3.8 liters) | 5 gallons (18.9 liters) | 5 gallons (18.9 liters) | 5 gallons (18.9 liters) |
| Safety cans | 2 gallons (7.6 liters) | 5 gallons (18.9 liters) | 5 gallons (18.9 liters) | 5 gallons (18.9 liters) |
| Metal drums (DOT specifications) | 60 gallons (227 liters) | 60 gallons (227 liters) | 60 gallons (227 liters) | 60 gallons (227 liters) |
| Approved metal portable tanks | 660 gallons (2498 liters) | 660 gallons (2498 liters) | 660 gallons (2498 liters) | 660 gallons (2498liters) |

Not more than 60 gallons (227 liters) of Category 1, 2 and/or 3 flammable liquids or 120 gallons (454 liters) of Category 4 flammable liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

Storage of containers (not more than 60 gallons [227 liters] each) shall not exceed 1,100 gallons (4164 liters) in any one pile or area. Piles or groups of containers shall be separated by a 5-foot clearance. Piles or groups of containers shall not be nearer than 20 feet (6.1 meters) to a building.

Americas

# Flammable & Combustible Liquids

S3AM-126-PR1

## 1.0 Purpose and Scope

1.1 This procedure applies to all AECOM Americas based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

1.2 The purpose of this procedure is to provide information regarding the proper storage, handling, and work practices associated with flammable and combustible liquids.

## 2.0 Terms and Definitions

2.1 **Flashpoint** – The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. The flash point is normally an indication of susceptibility to ignition.

2.2 **Safety can** – Safety can: an approved container, of not more than 5 gallons (18.9 liters) capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure



## 3.0 References

3.1 S3AM-011-PR1 Fire Protection

3.2 S3AM-115-PR1 Hazardous Material Communication

3.3 S3AM-208-PR1 Personal Protective Equipment

3.4 S3AM-332-PR1 Hot Work

## 4.0 Procedure

4.1 Implementation of this standard is the responsibility of the AECOM manager directing activities of the facility, site, or project location.

4.2 Appoint a Responsible Person who will:

4.2.1 Determine if flammable or combustible liquids are stored on-site. Flammable liquids and combustible liquids are classified or categorized differently by jurisdiction. As a general definition that aligns the different classifications or categories, flammable and combustible liquids are any liquid that has a flashpoint at or below 199.4°F (93°C). Refer to *S3AM-126-ATT1 Flammable & Combustible Liquid Classifications.*

4.2.2 Inspect storage areas monthly.

4.2.3 Monitor the quantity of flammable and combustible liquids on the site.

4.2.4 Review work practices involving flammable and combustible liquids.

4.2.5 Safety data sheets (SDS) for all hazardous substances, including flammable and combustible liquids, must be provided by vendors or subcontractors, and maintained on site. For more information, see *S3AM-115-PR1 Hazardous Material Communication*.

4.2.6 Furnish portable fire extinguishers in such quantities, sizes, and types as needed for the special hazards of operation and storage. For more information, see *S3AM-011-PR1 Fire Protection*.

4.3 Control flammable and combustible liquids entering the site by ordering only those materials and quantities needed to complete a job.

4.4 Cylinders – General Use & Transport

4.4.1 Open and close cylinder valves using the appropriate tools provided by the cylinder supplier.

4.4.2 Remove regulators and replace caps before transporting cylinders.

4.4.3 Do not roll or drop cylinders. Transport cylinders in a vertical and secured positing using a cylinder basket, cylinder cart or other secure equipment.

4.4.4 Do not use cylinders if the cap cannot be removed by hand. Do not use tools (e.g., hammer) to loosen caps. Tag the cylinder "Do Not Use" and return the cylinder to a designated storage area to be returned to the cylinder supplier.

4.5 General Storage

4.5.1 Use only approved containers, tanks, and pumping equipment for storage and handling of flammable and combustible liquids. Use approved (UL or FM) metal safety cans (with spring-closing lid and spout cover, and optional flash-arresting screen) for the handling and use of flammable liquids in 1- to 5-gallon (3.8- to 18.9-liter) quantities. For additional information, see *S3AM-126-ATT1 Flammable & Combustible Liquid Classifications.*

4.5.2 Place all rags, waste, etc., soiled by combustible or flammable materials in tightly closed metal containers for daily disposal.

4.5.3 Take precautions, including proper ventilation, to prevent the ignition of flammable vapors. Sources of ignition include, but are not limited to: open flames; lightning; smoking; cutting and welding; hot surfaces; frictional heat; static, electrical, and mechanical sparks; spontaneous ignition; chemical reactions; and radiant heat.

4.5.4 Require approved personal protective equipment for all persons handling flammable or combustible liquids, as outlined by the appropriate SDS.

4.5.5 Train employees exposed to flammable or combustible liquids in the hazards of these materials; in their safe handling, use and disposal; in their protection from ignition sources; in the type, use, and placement of containers and cabinets; in the location of fire extinguishers; in the protection against toxic vapors; and in the procedures to follow in case of spill or fire.

4.6 Indoor Storage

4.6.1 Keep indoor storage of flammable liquids to a minimum. Do not store more than 25 gallons (95 liters) of flammable or combustible liquids outside of an approved storage cabinet.

4.6.2 Do not store flammable or combustible liquids in areas used for exits, stairways, or normally used for the safe passage of people.

4.6.3 Do not store more than of flammable and combustible liquids in a single flammable storage cabinet in excess of that specified by the applicable jurisdiction. Refer to *S3AM-126-ATT1 Flammable & Combustible Liquid Classifications*.

4.6.4 Do not store oxidizers and other reactive chemicals in flammable cabinets.

4.6.5 Up to three cabinets may be grouped together. Groups of cabinets must be separated by at least 100 feet (30.5 meters).

4.6.6 Conspicuously label all cabinets "Flammable — Keep Fire Away."

4.6.7 Indoor flammable liquid storage rooms must conform to NFPA codes, including requirements regarding fire ratings, spill containment, maximum capacity, electrical classifications, and ventilation requirements.

4.7 Outside Storage

4.7.1 Maintain a minimum of 20 feet (6.1 meters) between flammable and combustible storage areas and any building.

4.7.2 Maintain a minimum distance of 50 feet (15.2 meters) between flammable and combustible storage areas and hot work activities. Refer to *S3AM-332-PR1 Hot Work*.

4.7.3 Grade the storage area in a manner to divert possible spills away from buildings, and curb or dike so as to contain entire volume of liquids and prevent spills from impacting soil or groundwater.

4.7.4 Keep the entire storage site free from accumulation of unnecessary combustible materials. Closely cut weeds and grass, and establish a regularly scheduled cleanup procedure for the whole area.

4.7.5 Maintain adequate access-ways to open-yard storage to allow access by fire-fighting equipment. Equipment that is blocking access must be manned at all times so that it may be readily moved if necessary.

4.8 Labeling and Signage

4.8.1 Post a "NO SMOKING OR OPEN FLAME" sign in all areas where flammable and combustible materials are stored, handled, and processed.

4.8.2 Require all containers and cylinders to be labeled with the contents and adequate hazard warnings per *S3AM-115-PR1 Hazardous Materials Communication.*

4.9 Use of Materials on Site

4.9.1 Use flammable and combustible liquids in a manner that is consistent with the label and SDS for the product.

4.9.2 Use only those amounts of materials needed for the job. Transfer of these materials to ready-to-use containers is encouraged.

4.9.3 Use personal protective equipment stated on the product label and SDS. For additional information, consult *S3AM-208-PR1 Personal Protective Equipment*.

4.9.4 For dispensing and/or fueling operations, ensure:

- Signs are posted with instructions on the dispensing or fueling process.
- Operators have been trained in the dispensing or fueling process.
- Equipment being refueled has the engine shut off prior to fueling.
- Smoking is prohibited in vehicle and equipment refueling areas.
- Adequate protection is provided to safeguard dispensing pumps from physical damage from vehicles.
- Dispensing nozzles have auto shut-off or self-closing valves and provisions for containing or controlling over-spillage.
- Heating equipment installed in lubrication or service areas, where flammable liquids are dispensed, is of an approved type, and where feasible, is installed at least 8 feet (2.4 meters) above the floor.
- Tank cars and trucks being loaded or unloaded and flammable storage tanks and systems are properly bonded and grounded.
- Transfer of flammable liquids from one container to another is done only when containers are electrically interconnected (bonded).
- Proper PPE is required during the dispensing or fueling process. For additional information, see *S3AM-208-PR1 Personal Protective Equipment*; and *S3AM-126-FM1 Flammable and Combustibles Inspection.*

4.10 Spill Control

4.10.1 Have a written spill response plan in place before materials are stored or used on site.

4.10.2 Have spill clean-up materials in the vicinity of the materials being stored.

4.10.3 Clean up or respond to spills promptly according to applicable local, state, and federal regulations. This may require notification of authorities if a Reportable Quantity (RQ) is exceeded.

4.10.4 Move leaking cylinder to a ventilated area away from ignition sources. Do not attempt to repair a leaking cylinder. Contact the cylinder supplier to determine proper response methods.

4.11 Disposal

4.11.1 Keep solvent waste and flammable liquids in fire-resistant, covered containers until they are removed from the worksite.

4.11.2 Do not place flammable or combustible waste in municipal garbage.

4.11.3 Do not pour flammable or combustible liquids down drains or onto the ground.

4.11.4 Dispose of flammable or combustible hazardous materials with a licensed and approved hazardous material disposal company.

4.12 Inspection

4.12.1 Inspect flammable and combustible storage and use areas on a monthly basis.

4.12.2 Use *S3AM-126-FM1 Flammable & Combustibles Inspection* or equivalent to inspect the storage areas.

4.12.3 Inspect cylinder regulators, gauges, valves, hoses and connections before use. Any damaged equipment shall be tagged out-of-service.

4.13 Training

4.13.1 Require that hazard communication training includes specific hazard information for the flammables and combustibles used.

4.14 Compliance

4.14.1 Review and comply with country and client/customer-specific requirements.

## 5.0 Records

5.1 The following information will be maintained in the project file.

5.1.1 Location of the SDS inventory.

5.1.2 Completed *S3AM-126-FM1 Flammable & Combustibles Inspection* or equivalent.

## 6.0 Attachments

6.1 S3AM-126-ATT1 Flammable & Combustible Liquid Classifications

6.2 S3AM-126-FM1 Flammable & Combustibles Inspection

Americas

# Hand & Power Tools

S3AM-305-PR1

## 1.0 Purpose and Scope

1.1 This procedure provides the AECOM requirements for all manually operated hand and power tools and associated use, handling and storage. These requirements apply to tools provided by AECOM for employee use as well as tools provided by employees for use on AECOM work sites.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

## 2.0 Terms and Definitions

2.1 None

## 3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-118-PR1 Hearing Conservation

3.3 S3AM-208-PR1 Personal Protective Equipment

3.4 S3AM-302-PR1 Electrical Safety

3.5 S3AM-325-PR1 Lockout Tagout

## 4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Managers/Supervisors**

- Ensure that all aspects of this procedure are followed and adhered to on all AECOM projects, sites and locations.
- If a specific tool is not included in the work instructions related to this procedure, appropriate guidelines shall be established prior to work associated with that tool, including following manufacturer's recommendations.
- Ensure compliance with applicable client requirements and restrictions regarding hand or power tools.

4.1.2 **Safety, Health and Environment (SH&E) Manager**

- Provide technical guidance and support as to this procedure and associated work instructions.

4.1.3 **Employees**

- Work only with tools for which they are appropriately trained and familiar with.
- Follow manufacturer's recommendations for its use and never modify the equipment without first obtaining authorization from the manufacturer.
- Comply with applicable client requirements and restrictions regarding hand or power tools.

4.2 Requirements

4.2.1 Always conduct a task hazard assessment (THA) prior to work commencing and include the identified hazards associated with the anticipated tool use.

4.2.2 No employee shall use any hand or power tool, unless they are familiar with the use and operation of the equipment or have received specific instruction on its use and operation.

4.2.3 All tools will be used for which they were designed and in accordance with manufacturer's specifications. Do not use tools for jobs they are not intended for. For example, do not use a slot screw driver as a chisel, pry bar, wedge or punch or wrenches as hammers.

4.2.4 Use approved tools only. Never modify or use makeshift tools.

4.2.5 Do not apply excessive force or pressure on tools unless permitted by the manufacturer's specifications. This includes additional force by hammering with body weight, foot or other tools.

4.2.6 Keep surfaces and handles clean and free of excess oil and grease to prevent slipping.

4.2.7 Do not carry sharp tools (e.g. knife, chisel, screwdriver, etc.) in pockets; this practice may cause puncture wounds.

4.2.8 All tools shall be properly maintained. Clean, dry, lubricate and repair tools as applicable, and return to a suitable toolbox, room, rack, or other storage area upon completion of a job.

4.2.9 Ensure proper ergonomics principles are observed when using hand and power tools, such as but not limited to:

- Avoid static and awkward positions when possible.
    - Move at intervals to reduce muscle fatigue.
    - Consider tools with a trigger strip, rather than a trigger button. This strip will allow the exertion of more force over a greater area of the hand that, in turn, will reduce muscle fatigue
- Do not apply excessive force or pressure on tools.
- If possible use tools with comfortable grips that are designed to allow the wrist to stay straight. Avoid using a bent wrist.
- Choose hand tools that have a centre of gravity within or close to the handle.
- Frequently used tools that weigh more than 1 pound (0.45 kilograms) should be counter-balanced.
- Ensure proper body positioning when using a tool to prevent slips or falls in the event of unanticipated tool behaviour (slip, kickback, etc.). Avoid over-reaching.
- Pull on tools such as a wrench or pliers whenever possible. Loss of balance is more likely when pushing if the tool slips. If pushing is necessary, hold the tool with an open palm.
- Hand-arm vibration exposure is associated with the use of hand tools.
    - Reduce power to the lowest setting that can complete the job safely. This action reduces tool vibration at the source.
    - Consider the need for controls such as limiting time of use.
    - If safe to do so, adjust to a looser but stable grip, and use anti-vibration gloves.
- Use of heavy tools such as jackhammers can cause fatigue and strains. Heavy rubber grips can reduce these effects by providing a secure handhold.
- Do not increase a tool's leverage by adding sleeved additions (e.g. a pipe or snipe) to increase tool handle length.

4.2.10 Avoid placing fingers and hands in danger zones:

- Ensure hands and fingers have sufficient clearance in the event the tool slips.
- Ensure stability of the work-piece. Use work-piece holders (e.g. vise, chisel holder, etc.) whenever possible to prevent injury to hands or deflection of tool or work-piece.

- Use push sticks or guides when cutting or machining smaller material.

4.2.11 Secure tools when working from heights to prevent them from falling. Never leave tools on ladders, scaffolds, or overhead work areas when they are not in use.

4.2.12 Utilize good housekeeping practices to ensure tools do not present a tripping hazard.

4.2.13 Ensure no part of a tool extends over the edge of the bench top. Place sharp tools (e.g., saws, chisels, knives) on benches so that sharp points or edges face away from the edge.

4.2.14 When using saw blades, knives, or other tools, if possible direct the tools away from aisle areas and away from other employees working in close proximity.

4.2.15 Do not throw tools from place to place or from person to person, or drop tools from heights. Hand them, handle first, directly to other workers.

4.2.16 Use non-sparking and intrinsically safe tools in atmospheres with flammable or explosive characteristics and where highly volatile liquids, and other explosive substances are stored or used.

- Iron or steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools made of non-ferrous materials shall be used.
- Electrical tools shall be identified as intrinsically safe.

4.2.17 If the task presents electrical hazards, worker must be competent and use the appropriate insulated tools to perform work that includes the risk of electrical shock. Cushioned grip handles do not protect against electrical shock.

4.2.18 The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed. The exception to fire-resistant fluid involves all hydraulic fluids used for the insulated sections of derrick trucks, aerial lifts, and hydraulic tools that are used on or around energized lines. This hydraulic fluid shall be of the insulating type.

4.2.19 All tools designed to accommodate guards must have the guard(s) in place when the tool is in use. Do not modify, remove, or disable any machine guards.

4.2.20 Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.

4.2.21 Make provisions to prevent tools from automatically restarting upon restoration of power. Refer to *S3AM-325-PR Lockout Tagout*.

4.3 Training

4.3.1 Instruction in the proper use, safe handling, and maintenance of tools will be provided to employees unfamiliar with the tool.

- Assess the employee's training needs as per *S3AM-003-PR1 SH&E Training* procedure.
- Refer to the applicable work instructions associated with this procedure for any additional training specifics.
- Training shall include applicable manufacturer's recommendations and guidelines.

4.3.2 Employees shall demonstrate knowledge and competency in the use, safe handling and maintenance of the applicable tool prior to operation.

4.4 Personal Protective Equipment (PPE)

4.4.1 Utilize basic PPE appropriate to the task; gloves, safety-toed boots, hard hats and safety glasses with side shields. Refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.4.2 Ensure lockout devices (padlocks, multiple lock hasps, tags) are utilized as necessary. Refer to *S3AM-325-PR Lockout Tagout*.

4.4.3 Ensure PPE is appropriate to the work and use additional PPE as required (e.g. mono-goggles, hearing protection, respiratory protection, etc.).

- Dual eye protection is required to be worn by any employee undertaking or within 3 ½ feet (1 meter) of a task that produces projected particles or material.
- Head and face protection is recommended for employees working with pneumatic tools.
- Noise hazard is associated with pneumatic and many other tools. Working with noisy tools such as jackhammers requires proper, effective use of appropriate hearing protection.

4.4.4 Screens shall also be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.

4.4.5 Refer to the applicable work instructions associated with this procedure for any additional specialized PPE.

4.5 Inspections

4.5.1 All tools must be inspected prior to each use.

- Any tool that is defective or has missing parts must not be used.
- Every broken or defective tool must be tagged 'out of service' or 'do not use' and immediately removed from service.
- Tagged tools will be returned to the supervisor for repair or replacement.

4.5.2 All tools must be inspected to manufacture's specifications and according to tool rests and guard adjustment tolerances. All tools will be inspected to ascertain that all safety devices are present and functioning properly. Refer to *S3AM-305-FM1 Hand & Power Tool Maintenance Inventory* and *S3AM-305-FM2 Hand & Power Tool Inspection Report*.



## 5.0 Records

5.1 None

## 6.0 Attachments

6.1 S3AM-305-ATT1 Chainsaw

6.2 S3AM-305-ATT2 Circular Saw

6.3 S3AM-305-ATT3 Cut Off Saw

6.4 S3AM-305-ATT4 Handheld Grinder

6.5 S3AM-305-ATT5 Impact Wrench

6.6 S3AM-305-ATT6 Nail Gun

6.7 S3AM-305-ATT7 Dustless Vacuum

6.8 S3AM-305-ATT8 Power Drill

6.9 S3AM-305-ATT9 Pressure Washer

6.10 S3AM-305-ATT10 Reciprocating Saw

6.11 S3AM-305-ATT11 Sander

6.12 S3AM-305-ATT12 Knives

6.13 S3AM-305-ATT13 Clearing & Grubbing Equipment

6.14 S3AM-305-ATT14 Pneumatic Tools

6.15 S3AM-305-ATT15 Manual Hand Tools

6.16 S3AM-305-ATT16 Small Engines

6.17 S3AM-305-ATT17 Electric & Battery Hand Tools

6.18 S3AM-305-FM1 Hand & Power Tool Maintenance Inventory

6.19 S3AM-305-FM2 Hand & Power Tool Inspection Report

Americas

# Heavy Equipment

S3AM-309-PR1

## 1.0 Purpose and Scope

1.1 Outline the safe working requirements for working with and near heavy equipment and heavy equipment operation.

1.2 Military related vehicles and equipment (e.g. tanks) are not covered under this standard.

1.3 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

## 2.0 Terms and Definitions

2.1 **Heavy equipment** –All excavating equipment (e.g. scrapers, loaders, crawler or wheel tractors, excavators, backhoes, bulldozers, graders, agricultural and industrial tractors, etc.), cranes, lift trucks, drills, etc. This may include off-highway trucks (e.g. dump truck, heavy haul truck, etc.). For requirements related to crew trucks refer to *S3AM-005-PR1 Driving*.

2.2 **Operator** – Any person who operates the controls while the heavy equipment is in motion or the engine is running.

2.3 **Ground personnel/workers** – Personnel performing work on the ground around heavy equipment (note: operators are considered ground personnel when outside of the equipment cab).

## 3.0 References

3.1 S3AM-005-PR1 Driving

3.2 S3AM-202-PR1 Competent Person Designation

3.3 S3AM-213-PR1 Subcontractor Management

3.4 S3AM-303-PR1 Excavation

3.5 S3AM-322-PR1 Overhead Lines

3.6 S3AM-325-PR1 Lockout Tagout

3.7 S3AM-331-PR1 Underground Utilities & Subsurface Installation Clearance

## 4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Managers / Supervisors**

- Responsible for confirming all equipment is in good working order and all equipment operators are verified as qualified on the piece of machinery they are assigned.
- As applicable, review as-built drawings.
- Maintain operation manuals at the site for each piece of equipment that is present on the site and in use.
- Maintain a list of operators for the project, and the specific equipment that they are authorized to operate.
- Prohibit equipment from being operated by any personnel who have not been specifically authorized to operate it.

- Confirm an equipment maintenance inventory is maintained, schedules adhered to and appropriate inspections of equipment are conducted.
- Confirm subcontractors are properly pre-qualified in accordance with *S3AM-213-PR1 Subcontractor Management.*
- Require that subcontractor employees follow established safety procedures in operation, inspection, and maintenance of vehicles and equipment.
- Inform AECOM and subcontractor machinery operators about applicable local regulations restricting the consecutive minutes of engine idling time allowed.
- Confirm subcontractor machinery and mechanized equipment is approved for use in accordance with the requirements of *S3AM-309-FM1 Approval of Machinery & Mechanized Equipment*.
- Confirm that all rented equipment bears any required current certification marks and arrives in proper working order with the manufacturer's operating manual before acceptance from the supplier.
- Confirm that AECOM and subcontractor machinery and mechanized equipment is certified, as applicable, in accordance with manufacturer specifications and/or regulatory requirements.
- Visually observe the subcontractors' vehicles and equipment, for any unsafe conditions or practices. Equipment or operation not in compliance with applicable safety standards is prohibited.

4.1.2 **Employees / Ground Personnel**

- Confirm that all rented equipment arrives in proper working order with the manufacturer's operating manual before acceptance from the supplier.
- Ground personnel when working in the vicinity of heavy equipment shall have received training, and comply with the applicable rules of engagement.

4.1.3 **Operators (of heavy equipment)**

- Operate the equipment safely, maintain full control of the equipment, and comply with manufacturer's operation manual and the laws governing the operation of the equipment.
- Inspect equipment and immediately report defects and conditions affecting the safe operation of the equipment to the appropriate Supervisor.
- Trainees may operate equipment in accordance with jurisdictional requirements and under the direct supervision of a trainer.

4.2 Communication

4.2.1 Communication between site Managers / Supervisors, heavy equipment Operators, and site Employees / Ground Personnel is a key method of preventing serious injury or death during heavy equipment operations.

4.2.2 Managers shall confirm the Industrial site or project specific SH&E Plan is developed and communicated to all affected and involved employees. Refer to *S3AM-209-PR1 Risk Assessment & Management*.

4.2.3 Task Hazard Assessments and Daily Tailgate meetings shall be conducted in accordance with *S3AM-209-PR1 Risk Assessment & Management.*

4.2.4 Concerning worksites in which other employers control concurrent operations and SH&E issues related to the worksite, the manager shall coordinate with those conducting concurrent operations to confirm appropriate control measures are in place to protect employees from the hazards associated with activities to be performed.

- Coordination shall occur prior to work commencing, periodically thereafter, and as necessary given changes in scope and/or working conditions.
- Affected employees (including managers and supervisors) shall seek to participate in all site SH&E meetings related to concurrent operations.

4.2.5 The following points outline the communication requirements during heavy equipment operations:

- Site Supervisors/t Managers shall confirm that all operators are notified/informed of when, where, and how many ground personnel will be working on site.
- Site Supervisors/ Managers shall inform all ground personnel before changes are made in the locations of designated work areas.
- Prior to work initiating on site, the Site Supervisor/ Manager is to confirm all operators and ground personnel are trained on the hand signals that will be used to communicate between operators and ground personnel.
- Ground Personnel working around heavy equipment operations are to maintain eye contact with operators to the greatest extent possible (always face equipment). Never approach equipment from a blind spot or angle.
- All heavy equipment whose backup view can be obstructed shall be equipped with reverse warning devices (e.g., backup alarms) that can be significantly heard over equipment and other background noise. Reverse signaling lights shall be in working order.
- When feasible, two-way radios shall be used to verify the location of nearby ground personnel.
- When an operator cannot adequately survey the working or traveling zone, a signal person shall use a standard set of hand signals to provide directions. Flags or other high visibility devices may be used to highlight these signals.

4.3 Ground Personnel

4.3.1 Ground clearance around heavy equipment may significantly reduce hazards posed during heavy equipment operations.

4.3.2 The following points outline the clearance requirements during heavy equipment operations:

- Ground Personnel shall always yield to heavy equipment.
- Ground Personnel shall maintain a suitable “buffer” area of clearance from all active heavy equipment.
- A task hazard assessment that identifies any special precautions shall be completed and communicated to all AECOM personnel associated with or affected by the activity.
- Site Supervisors/ Managers shall designate areas of heavy equipment operation and confirm that all ground personnel are aware of designated areas.
    - Designated areas shall include work zone boundaries and travel routes for heavy equipment.
    - Travel routes shall be set up to reduce crossing of heavy equipment paths and to keep heavy equipment away from ground personnel.
    - Work zone boundaries shall consider line of fire hazards related to the equipment and associated activities. Refer also to *S3AM-309-ATT2 Operator Line of Sight.*
    - If working near heavy equipment, Ground Personnel shall stay clear of loads to be lifted or suspended loads, and out of the travel and swing areas (excavators, all-terrain forklifts, hoists, etc.) of all heavy equipment.
    - During winch use, all swampers or other personnel will remain outside the “whip area” of the winch line or tow cable.

- At a minimum, employees shall maintain a distance of at least two pile lengths from where piles are being cut and dropped, other than in situations where cut piles are being guided to the ground utilizing mechanical means (e.g., pile driver and shackle) to control the direction and speed of fall of the cut pile.

- When feasible, Site Supervisors/ Managers shall set up physical barriers (e.g., caution tape, orange cones, concrete jersey barriers) around designated areas and confirm that unauthorized ground personnel do not enter such areas.
- Operators shall stop work whenever unauthorized personnel or equipment enter the designated area and only resume when the area has been cleared.
- Operators shall only move equipment when aware of the location of all workers and when the travel path is clear.
- Ground Personnel shall never stand between two pieces of operating heavy equipment or other objects (e.g., steel support beams, trees, buildings, etc.).
- Ground Personnel shall never stand directly below heavy equipment located on higher ground unless it can be verified ground stability is not a factor and grade of slope is such that it would not contribute to equipment tip-over.
- Ground Personnel may only enter the swing area, work area or path of travel of any operating equipment when:
  - They have attracted the operator's attention and established eye contact, and
  - The operator has idled the equipment down, placed it in neutral, grounded engaging tools, set brakes and communicated entry is permitted.
- Employees shall keep all extremities, hair, tools, and loose clothing away from pinch points and other moving parts on heavy equipment.
- Employees shall not talk, text, or otherwise use a cell phone while standing or walking on a roadway or other heavy equipment path.

4.3.3 At a minimum, all Ground Personnel and Operators outside of heavy equipment shall wear the following:

- High visibility safety vest (fluorescent background material and retro-reflective striping) meeting jurisdictional requirements that is visible from all angles.
  - Background material: should be fluorescent yellow-green, fluorescent orange-red or fluorescent red.
  - Combined-performance retro-reflective material (e.g. the stripes): should be fluorescent yellow-green, fluorescent orange-red or fluorescent red - and shall be in contrast (that is, have a distinct color difference) to the background material.
  - Hazards may require high visibility garments that cover torso, legs and arms.
  - Confirm that vest is not faded or covered with outer garments, dirt, etc.
- American National Standards Institute/Canadian Standards Association- (ANSI/CSA-) approved hard hat
- ANSI/CSA-approved safety glasses with side shields
- At a minimum, CSA or ASTM approved, high-cut (min. 6"), puncture, impact and compression resistant footwear.
- ANSI/CSA-approved hearing protection as needed
- Appropriate work clothes (e.g., full-length jeans/trousers and a sleeved shirt; no tank, crew tops or other loose clothing permitted).

4.4 Prior to work commencing

4.4.1 All heavy equipment will be inspected pre-shift and then regularly as required with the details of the inspection recorded in a log book.

- Roll-over protection systems (ROPS) and appropriate overhead protection (Fall Object Protection FOP) shall be in place given the specific equipment requirements. Utilize equipment with enclosed cabs where feasible or accessible.
    - Where use of equipment with enclosed cabs is not feasible or said equipment is not accessible, operators shall use any additional personal protective equipment determined as necessary (e.g. goggles, additional hearing protection, etc.).
- Equipment operated in hazardous atmosphere environments shall be equipped with the proper safety equipment (e.g., spark arrestors, positive air shut off, etc.).
- Operation of equipment that has or had cab glass (per the manufacturer's specifications) that is cracked/broken (obstructing the operator's view) or missing is prohibited.
- A locking device shall be provided that will prevent the accidental separation of towed and towing vehicles on every fifth-wheel mechanism and two-bar arrangement.
- Trip handles for tailgates of dump trucks and heavy equipment shall be arranged so that when dumping, the operator will be in the clear.
- The Operator will report defects and conditions affecting the safe operation of the equipment to the Site Supervisor or employer. Any repair or adjustment necessary for the safe operation of the equipment will be made before the equipment is used.
- Exposed moving parts on heavy equipment (belts, gears, shafts, pulleys, sprockets, spindles, drums, fan belts, flywheels, chains, or other reciprocating, rotating or moving parts) which are a hazard to the operator or to other workers will be guarded.
    - If a part will be exposed for proper function it will be guarded as much as is practicable consistent with the intended function of the component.

4.4.2 An approved 4A40BC fire extinguisher shall be present on all heavy equipment. An approved 4A40BC fire extinguisher of appropriate rating shall be present and readily accessible on all heavy equipment.

- Fire extinguishers shall be inspected by the operator prior to heavy equipment operation each shift. Monthly and annual inspections shall be documented.

4.4.3 All Operators shall inspect the area adjacent to the machine prior to starting.

- Evaluate ground conditions, concurrent operations and obstructions to identify approved routes of travel and work areas.
- As applicable, check that there is sufficient swing room and that the outriggers are adequately supported on solid and stable ground

4.4.4 Managers / Supervisors shall inform the operators of the equipment that AECOM employees are in the area and inquire if there are any restricted areas or specific rules or requirements. In some industrial facilities, heavy equipment has the 'right of way'.

4.4.5 Where the Operator will not have a full view of the path of travel, a signal person will be used on the ground that has a full view of the load, the operator, and the path.

4.4.6 All heavy equipment with limited visibility (operator cannot directly or by mirror or other effective device see immediately behind the machine) operated around workers or on a construction site:

- Shall have an audible back-up alarm installed that functions automatically when the vehicle or equipment is put into rear motion.

- All bi-directional equipment shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction.
- Backing up or movement in both directions for bidirectional equipment shall occur only when a signal person communicates that it is safe to do so if alarms or horns are not feasible.

4.5 Operation

4.5.1 The Operator of heavy equipment is the only worker permitted to ride the equipment unless the equipment is equipped by the manufacturer for passengers. Manufacturer operator's manual shall be complied with.

4.5.2 A person will not operate heavy equipment unless the person has received adequate instruction and training in the safe use of the equipment, and has demonstrated to a qualified supervisor or instructor competency in operating the equipment.

- Oilers, apprentices, and other operators will not be allowed to operate equipment unless authorized by the Manager.

4.5.3 The Operator of heavy equipment will operate the equipment safely, maintain full control of the equipment, and comply with the manufacturer's operator manual and the laws governing the operation of the equipment.

- Operation of company-owned, leased, or rented vehicles or equipment while under the influence of alcohol or illegal drugs or otherwise impaired is prohibited.
- Do not operate any equipment beyond its safe load or operational limits.
- Operator shall not talk on, text, or otherwise use mobile phones while operating heavy equipment.
- Never use bucket teeth or boom for lifting or moving heavy objects.

4.5.4 When heavy equipment is used for lifting or hoisting or similar operations there shall be a permanently affixed notation stating the safe working load capacity of the equipment and the notation shall be kept legible and clearly visible to the operator.

4.5.5 A Supervisor or Manager will not knowingly operate or permit a worker to operate heavy equipment which is, or could create, an undue hazard to the health or safety of any person. Where compliance is refused, the Manager or his or her designate should be notified immediately.

4.5.6 The Operator of heavy equipment will not leave the controls unattended unless the equipment has been secured against inadvertent movement.

- The Operator is not to leave suspended load, machine or part or extension unattended, unless it has been immobilized and secured against inadvertent movement.
- Turn off heavy equipment, place gear in neutral and set parking brake prior to leaving vehicle unattended.
- Buckets and blades are to be placed on the ground and with hydraulic gears in neutral when not in use.
- Brakes shall be set and, as necessary, wheels chocked or equivalent (as applicable) when not in use.

4.5.7 The Operator will maintain the cab, floor and deck of heavy equipment free of material, tools or other objects which could create a tripping hazard, interfere with the operation of controls, or be a hazard to the operator or other occupants in the event of an accident.

4.5.8 If heavy equipment has seat belts required by law or manufacturer's specifications, the Operator and passengers will use the belts whenever the equipment is in motion, or engaged in an operation which could cause the equipment to become unstable.

- Seat belts shall be maintained in functional condition, and replaced when necessary to ensure proper performance.

4.5.9 All vehicles transporting material or equipment on public roads shall comply with local laws pertaining to weight, height, length, and width. Obtain any permits required for these loads.

4.5.10 Never jump on to or off of a piece of heavy equipment, always maintain 3-points of contact at a minimum.

4.5.11 Never exit heavy equipment while it is in motion.

4.5.12 Do not ride with arms or legs outside of the truck body of equipment cab.

- Never ride on the outside of a piece of heavy equipment (e.g. in a standing position on the body, on running boards, or seated on side fenders, cabs, cab shields, rear of truck bed, on the load, bucket, etc.).

4.5.13 Have vehicle headlights on at all times when driving in the area.

4.5.14 Park motor vehicles off the haul roads, or away from the work areas.

4.5.15 Do not wear loose clothing or jewelry where there is a danger of entanglement in rotating equipment.

4.5.16 Do not enter the swing area of machines such as cranes, heavy drill rigs, or excavators, without first making eye contact with the operator, and receiving permission to do so. Refer to *S3AM-309-ATT2 Operator Line of Sight.*

4.5.17 Stay out of the blind areas around heavy equipment and never assume that the equipment operators have seen you or are aware of your presence.

4.5.18 Maintain a distance of at least 2 feet (60 centimeters) between the counterweight of swing machines and the nearest obstacle. If this distance cannot be maintained, a spotter shall observe and be in constant communication with the operator to prevent contact.

4.5.19 Vibrations from moving traffic or heavy equipment can cause excavations or spoil piles to become unstable.

- Excavation activity shall be conducted according to *SOP S3AM-303-PR1 Excavation*.
- Equipment not involved in the excavating activity or not required to be in the vicinity shall keep clear. Equipment that shall operate in the vicinity shall maintain appropriate setback distances from edges of excavations or spoil piles.

4.5.20 All heavy equipment shall be operated in a safe manner that will not endanger persons or property.

- When ascending or descending grades in excess of 5 percent, loaded equipment shall be driven with the load upgrade.
- When operating an electric-powered, remote controlled, hydraulic device used for demolishing concrete structures and refractory linings as well as excavating, refer to the *S3AM-309-ATT1 Brokk 180* for more specifics.

4.5.21 All heavy equipment shall be operated at safe speeds. Do not drive any vehicle at a speed greater than is reasonable and safe for weather conditions, traffic, intersections, width, and character of the roadway, type of motor vehicles, and any other existing condition.

4.5.22 Always move heavy equipment up and down the face of a slope. Never move equipment across the face of a slope.

4.5.23 Slow down and stay as far away as possible while operating near steep slopes, shoulders, ditches, cuts, or excavations.

4.5.24 When feasible, Operators shall travel with the “load trailing”, if the load obstructs the forward view of the operator.

4.5.25 Slow down and sound horn when approaching a blind curve or intersection. Signal people equipped with 2-way radio communications may be required to adequately control traffic.

4.5.26 All haulage equipment / trucks, whose payload is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cable shield and/or canopy adequate to protect the operator from shifting or falling material. If protection is not available for the operator, the operator shall leave the vehicle and wait in a designated safe location until it is loaded..

4.5.27 Equipment shall be shut down prior to and during fueling.

- Confirm proper grounding/ bonding between equipment and fuel vehicle prior to fueling operations.
- During fuel operations confirm fuel nozzle remains in contact with the tank.
- Do not smoke, use electrical devices or have an open flame present while fueling.
- Fuel shall not be carried in or on heavy equipment, except in permanent fuel tanks or approved safety cans.

4.5.28 Site vehicles will be parked in a designated parking location away from heavy equipment.

4.5.29 Operators shall never push/pull “stuck” or “broken-down” equipment unless a spotter determines that the area is cleared of all personnel around and underneath the equipment.

4.5.30 If designated for work in contaminated areas/zones, equipment shall be kept in the exclusion zone until work or the shift has been completed. Equipment will be decontaminated within designated decontamination areas.

4.5.31 Equipment left unattended at night adjacent to travelled roadways shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of that equipment, and shall not be closer than 6 feet (1.8m) (or the regulatory requirement for the work location) to the active roadway.

4.5.32 Rubber / pneumatic-tired earthmoving haulage equipment shall be equipped with fenders on all wheels. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

4.5.33 Lift trucks shall have the rated capacity clearly posted on the vehicle, and the ratings are not to be exceeded.

4.5.34 Steering or spinner knobs shall not be attached to steering wheels.

4.5.35 High-lift rider industrial trucks shall be equipped with overhead guards.

4.5.36 All hot surfaces of equipment, including exhaust pipes or other lines, that present a possible injury or fire hazard, shall be guarded or insulated.

4.5.37 All equipment having a charging skip shall be provided with guards on both sides and open end of the skip area to prevent persons from walking under the skip while it is elevated.

4.5.38 Platforms, foot walks, steps, handholds, guardrails, and toeboards shall be designed, constructed, and installed on machinery and equipment to provide safe footing and access ways.

4.5.39 Substantial overhead protection shall be provided for the operators of fork lifts and similar equipment.

4.5.40 In an effort to reduce air emissions, fuel costs, and run-time hours (that can impact equipment warranty), operators shall limit heavy equipment engine idling to not more than five consecutive minutes. Local regulations at the location of the vehicle operation could require less than five consecutive minutes idling time. The idling limit does not apply to:

- Idling when queuing.
- Idling to verify that the vehicle is in safe operating condition.

- Idling for testing, servicing, repairing or diagnostic purposes.
- Idling necessary to accomplish work for which the vehicle was designed (cranes, man-lifts, forklifts, etc.)
- Idling required to bring equipment/vehicle to operating temperature, as specified by the manufacturer. Engine heaters shall be used for cold weather starting to avoid engine idling where feasible.
- Idling necessary to ensure safe operation of the vehicle.
- Idling to keep equipment (including windows) clear of ice and snow.
- Idling to provide air conditioning or heat to ensure the health and safety of the operator, but only when seated inside the equipment or vehicle.

4.6 Utilities

4.6.1 When contacted by heavy equipment, aboveground and underground utilities may cause severe injuries or death as a result of electrocution, explosion, etc. Refer to the *S3AM-322-PR1 Overhead Lines* procedure for more specifics.

4.6.2 The following outline the requirements while performing heavy equipment operations that may lead to contact with aboveground or underground utilities:

- Always be aware of surrounding utilities.
- Confirm all equipment (e.g., dump trailers, loaders, excavators, etc.) is lowered prior to moving underneath aboveground utilities.
- Confirm utilities are cleared and identified prior to beginning any earthmoving operation. Contact the local utility service providers for clearance prior to performing work. Confirm documentation of the contact is made; date, number; contact name, organization, etc. Refer to *SOP S3AM-303-PR1 Excavation* and *S3AM-331-PR1 Underground Utilities & Subsurface Installation Clearance.*

4.7 Training

4.7.1 The Operator or other qualified supervisor will provide all on-site personnel with an orientation to the heavy equipment and its associated hazards and controls.

4.7.2 Only designated, qualified personnel shall operate heavy equipment.

4.7.3 Operators shall have all appropriate jurisdictional licenses or training to operate a designated piece of heavy equipment.

4.7.4 Operators shall be evaluated through documented experience and routine monitoring of activities unless the equipment is operated by an AECOM operator in which case a practical evaluation is required. Operators shall be knowledgeable and competent in the operation of a designated piece of heavy equipment.

4.8 Inspection and Maintenance

4.8.1 Maintenance records for any service, repair or modification which affects the safe performance of the equipment will be maintained and be reasonably available to the operator and maintenance personnel regulatory agencies upon request during work hours.

4.8.2 Maintenance records will be maintained on the site or project for heavy equipment.

4.8.3 Conduct maintenance as prescribed by the manufacturer in the Operation Manual for each piece of equipment.

4.8.4 Servicing, maintenance and repair of heavy equipment will not be done when the equipment is operating.

- Lockout and tagout safety procedures are followed. Refer to *S3AM-325-PR1 Lockout Tagout*.

- Motors are turned off, unless required for performing maintenance or repair.
- All ground-engaging tools are grounded or securely blocked.
- Controls are set in a neutral position and brakes are set.
- Electrically driven equipment is installed with provision for tagging and locking out the controls while under repair.
- Manufacturer's requirements for maintenance and repair are followed.
- If continued operation is essential to the process, a safe means of protection shall be provided.
- Provide and use a safety tire rack, cage, or equivalent protection when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.

4.8.5 All heavy equipment shall have a documented inspection and if necessary, repaired prior to use.

- Operators shall not operate heavy equipment that has not been cleared for use.
- All machinery and mechanized equipment will be verified to be in safe operating condition (refer to *S3AM-309-FM1 Approval of Machinery & Mechanized Equipment*) by a competent person (refer to *S3AM-202-PR1 Competent Person Designation*) within seven days prior to operation on a new site or project. Clearance is valid for up to one year for the given site or project.
- As applicable, all machinery and mechanized equipment shall be inspected / certified and tested at appropriate intervals as required by the manufacturer and/or regulatory requirements.

4.8.6 All heavy equipment shall be inspected at a minimum to the manufacturer's recommendations prior to each work shift. All defects shall be reported to the Supervisor/ Manager immediately.

- Defective heavy equipment shall be immediately tagged and taken out of service until repaired.
- Inspection, maintenance, service and repair records shall be maintained at the site. If a manufacturer's or company-specific inspection checklist is not provided, use *S3AM-309-FM2 Heavy Machinery Pre-Operation Checklist*.
- Records shall be made available for review upon request. Note: Documents may be electronically stored in the project files.

4.9 Fueling and batteries

4.9.1 A well-ventilated area shall be used for refueling.

4.9.2 Only the type and quality of fuel recommended by the engine manufacturer shall be used.

4.9.3 Fuel tanks shall not be filled while the engine is running. All electrical switches shall be turned off.

4.9.4 If there is potential to spill fuel on hot surfaces, the surfaces shall be permitted to cool down prior to fueling. Any spillage shall be cleaned before starting engine.

4.9.5 Spilled fuel shall be cleaned with cotton rags or cloths and disposed of in the proper receptacle; do not use wool or metallic cloth.

4.9.6 Open flames, lighted smoking materials, sparking equipment or any other type of ignition source shall remain a minimum of 35' (10.7m) from the fueling area and/or fuel source. This clearance shall be increased if required or conditions warrant.

4.9.7 Heaters in carrier cabs shall be turned off when refueling the carrier or the drill rig.

4.9.8 Portable containers to be filled shall be placed directly on the ground or be properly grounded prior to filling to prevent creation of a static charge. Portable fuel containers shall not be filled completely to allow expansion of the fuel during temperature changes.

4.9.9 Control electrostatic hazards.

- Before activating fuel pump, touch some part of vehicle / equipment to de-energize any static electricity that may be present.
- The fuel nozzle shall be kept in contact with the tank being filled to prevent static sparks from igniting the fuel.
- Fuel containers and transfer hoses shall be kept in contact with a metal surface during travel to prevent build-up of a static charge.

4.9.10 Portable fuel containers shall not travel in the vehicle or carrier cab with personnel.

4.9.11 Batteries shall be serviced in a ventilated area while wearing appropriate Personal Protective Equipment.

4.9.12 When a battery is removed from a vehicle or service unit, the battery shall be disconnected ground post first. Consult the SDS applicable to the battery and/or contents for additional information including; handling, precautions, and first aid measures.

- Spilled battery acid shall be immediately flushed off the skin with a continuous supply of water. Battery storage or maintenance areas shall have readily accessible eye wash stations.
- Should battery acid get into the eyes, the eyes shall be flushed immediately with copious amounts of water and medical attention shall be sought immediately.

4.9.13 When installing a battery, the battery shall be connected ground post last.

4.9.14 When charging a battery, cell caps shall be loosened prior to charging to permit gas to escape.

4.9.15 When charging a battery, the power source shall be turned off to the battery before either connecting or disconnecting charger loads to the battery posts.

4.9.16 To avoid battery explosions, the cells shall be filled with electrolytes. A flashlight (not an open flame) shall be used to check water electrolyte levels. Avoid creating sparks around batteries by shorting across a battery terminal. Lighted smoking materials and flames shall be kept at least a minimum of 35 feet (10.7 meters) away from battery-charging stations.

## 5.0 Records

5.1 Inspection, maintenance, service and repair records shall be maintained with the equipment.

## 6.0 Attachments

6.1 S3AM-309-ATT1 Brokk180 Safety Card

6.2 S3AM-309-ATT2 Operator Line of Sight

6.3 S3AM-309-FM1 Approval of Machinery & Mechanized Equipment

6.4 S3AM-309-FM2 Heavy Machinery Pre-Operation Checklist

6.5 S3AM-309-FM3 Rubber Tire Backhoe Operator Skill Evaluation

6.6 S3AM-309-FM4 Scraper Operator Skill Evaluation

6.7 S3AM-309-FM5 Bull Dozer Operator Skill Evaluation

6.8 S3AM-309-FM6 Dump Truck Operator Skill Evaluation

6.9 S3AM-309-FM7 Roller Compactor Operator Skill Evaluation

6.10 S3AM-309-FM8 Front End Loader Operator Skill Evaluation

6.11 S3AM-309-FM9 Grader Operator Skill Evaluation

6.12 S3AM-309-FM 10 Excavator Operator Skill Evaluation

6.13 S3AM-309-FM11 Water Truck Operator Skill Evaluation

6.14 S3AM-309-FM12 Heavy Equipment Maintenance Inventory

6.15 S3AM-309-FM13 Heavy Equipment Inspection Report

Americas

# Drilling, Boring & Direct Push Probing

S3AM-321-PR1

## 1.0 Purpose and Scope

1.1 This document provides procedures designed to help prevent injuries to personnel working on the project and pedestrians, property damage, and adverse environmental impact as a result of potential hazards associated with drilling, boring and direct-push probing. These hazards include, but are not limited to, encountering underground utilities, subsurface installations, rotating equipment and potential overhead hazards.

1.2 This procedure provides the minimum requirements to be followed when drilling, boring, and probing work are performed.

1.3 This procedure applies to all Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

1.4 The Manager is responsible for meeting all the requirements in this procedure.

1.5 AECOM's clients may have specific procedures which shall be followed to identify and map utility and subsurface structures on their properties or facilities. Provided the client's procedures meet or exceed those of AECOM, approval shall be obtained from the Manager and the SH&E Manager to follow the client's procedures.

## 2.0 Terms and Definitions

2.1 **Underground Utilities –** All utility systems located beneath grade level, including, but not limited to, gas, electrical, water, compressed air, sewage, signaling, and communications, etc.

2.2 **Ground Disturbance (GD) –** Any indentation, interruption, intrusion, excavation, construction, or other activity in the earth's surface as a result of work that results in the penetration of the ground.

2.3 **Intrusive Activities –** Examples: Excavation of soil borings, installations of monitoring wells, installation of soil gas sampling probes, excavation of test pits / trenches or other man-made cuts, cavity, trench, or depression in an earth surface formed by earth removal.

2.4 **Subsurface Installations –** Examples: Subterranean tunnels, underground parking garages, and other structures beneath the surface.

## 3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-118-PR1 Hearing Conservation

3.3 S3AM-208-PR1 Personal Protection Equipment

3.4 S3AM-209-PR1 Risk Assessment & Management

3.5 S3AM-213-PR1 Subcontractor Management

3.6 S3AM-305-PR1 Hand & Power Tools

3.7 S3AM-306-PR1 Highway and Road Work

3.8 S3AM-322-PR1 Overhead Lines

3.9 S3AM-322-FM1 Overhead Electrical Lines Acknowledgement

3.10 S3AM-325-PR1 Lockout Tagout

3.11 S3AM-326-PR1 Machine Guarding

3.12 S3AM-331-PR1 Underground Utilities

3.13 S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist

## 4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Confirm the development of the project SH&E Plan and compliance with this procedure.
- Confirm the appropriate equipment and materials are available to conduct the drilling, boring or direct-push operations.
- Confirm compliance with *S3AM-331-PR1 Underground Utilities.*
- Review the *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* prior to authorizing work to proceed.
- Confirm that employees conducting drilling, boring or direct-push probing possess any required training, registrations or certifications.
- Confirm all employees involved and affected by the task review the SH&E Plan, *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* and Task Hazard Assessment (THA) prior to work commencing.
- Confirm an equipment maintenance inventory is maintained, schedules adhered to and appropriate inspections of equipment are conducted.
- Provide authorization (with the concurrence of the Site Supervisor and SH&E Manager) for work to resume if interrupted due to unexpected conditions or events.

4.1.2 **Safety, Health & Environment (SH&E) Manager**

- Assist AECOM management as needed by providing guidance and clarification as to issues that may arise.
- Review the project SH&E Plan to confirm compliance with jurisdictional regulations**.** Provide technical guidance as needed when a variance is pursued related to this procedure. Confirm variance process meets requirements identified in *S2-001-SM1 Global SH&E Management System Manual*.

4.1.3 **Employees**

- Maintain training as appropriate to the work to be completed (e.g., ground disturbance, lockout tagout, equipment operation, etc.). Refer to *S3AM-003-PR1 SH&E Training.*
- Review the SH&E Plan, *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* and Task Hazard Assessment (THA) prior to work commencing.
- As appropriate to the anticipated or encountered hazards and as addressed in the applicable planning documentation, utilize appropriate personal protective equipment (PPE) and applicable training, practices and operating procedures.
- Immediately notify the Manager of any unanticipated conditions or events. If assigned equipment, perform appropriate inspections and confirmations of maintenance and / or repairs.

4.2 Training

4.2.1 All on-site employees involved with drilling, boring, and direct-push probing shall be trained, at a minimum, in these procedures and in the procedures of *S3AM-331-PR1 Underground Utilities*.

4.2.2 All operators and assistants shall have the appropriate safety training based on the SH&E Training Matrix and any additional training assessments developed at the business group**,** and be versed in the equipment to be utilized.

- Refer to *S3AM-003-PR1 SH&E Training.*

- This training may include, but is not limited to, Excavation / Trenching (Ground Disturbance), HAZWOPER, Petroleum Safety Training (or Construction Safety Training), and H2S Alive as appropriate.
- Only qualified personnel shall operate and inspect equipment.

4.2.3 All on-site Employees involved with drilling, boring, and direct-push probing activities shall be provided with on-site orientation of the drill rig and its operation.

4.2.4 All Employees involved with drilling, boring and direct-push probing activities at a client site shall receive the applicable client-required training**.**

4.3 Planning

4.3.1 SH&E Plan – At a minimum, a SH&E plan that includes a pre-job hazard assessment shall be prepared and communicated to all involved personnel prior to any drilling, boring, and direct-push probing activities. Refer to *S3AM-209-PR1 Risk Assessment & Management*.

- Assessment shall include both overhead and subsurface utilities and installations. Refer to *S3AM-322-PR1 Overhead Lines* and *S3AM-331-PR1 Underground Utilities*.
- The SH&E Plan will address any required environmental monitoring including gas monitoring, dust, noise, metals, radiation or other monitoring as may be appropriate for site conditions.
- All SH&E Plan requirements will be followed by the project team.
- The location specific emergency response plan shall be in place, contain procedures applicable to the potential emergencies presented by the operations, and be reviewed with all personnel potentially affected.

4.3.2 A Task Hazard Assessment (THA) shall be completed before every assigned task at the work location. The focus of the analysis shall be on the specific assigned task and the evaluation of risks and assignment of control measures based on actual work conditions.

4.3.3 *S3AM-321- ATT2 Pre-Drilling, Boring & Direct-Push Probing Flow Chart* summarizes the key Pre-Drilling, Boring, and Direct-push probing requirements addressed in this procedure.

4.3.4 Procedures and documentation as detailed in *S3AM-322-PR1 Overhead Lines* and *S3AM-331-PR1 Underground Utilities* shall be completed prior to any intrusive subsurface work.

- The locations of subsurface and overhead utilities and subsurface installations will be investigated, documented, mapped on a site plan and evidenced with appropriate surface markings.
- A site walk shall be conducted by the project team / site Manager and any other appropriate personnel, with the objectives of reviewing all planned intrusive activity locations, the locations of subsurface and overhead utilities and the potential for subsurface installations, to determine the appropriate utility clearance activities, and to observe other physical hazards.
- All proposed subsurface activities will be reviewed in comparison to subsurface and overhead utilities and subsurface installations and adjustments made as necessary.
- Appropriate clearance activities shall confirm location(s) of identified underground utilities and subsurface structures. Review the applicable completed *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist.*
- Site Walks should be repeated as necessary following the clearance of subsurface utilities and installations to confirm hazards are clearly identified.

4.3.5 Confirm drilling location(s) and / or bore entry and bore exit points are adequately identified on the worksite to enable appropriate equipment positioning.

4.4 Permits, Notifications and Access Agreements

4.4.1 Any required notifications shall be provided within the appropriate timeframe to the applicable organization (e.g. owner, agency, governing body, etc.).

4.4.2 All applicable permits (e.g. client, government, working near rail road, etc.) will be identified, obtained, and adhered to.

4.4.3 Access agreements will be obtained and adhered to as necessary.

4.5 Pre-Qualifying and Re-Qualifying Drilling Subcontractors

4.5.1 All drilling subcontractors will be properly pre-qualified in accordance with *S3AM-213-PR1 Subcontractor Management*.

4.5.2 The qualifications of the drilling crew performing the work will be evaluated prior to each mobilization and each day by AECOM's on-site representative to assure that their safety performance, training, qualifications, equipment, processes, and approaches reflect AECOM standards for excellence.

4.5.3 All drilling subcontractor equipment will be properly maintained and properly equipped, and the drilling subcontractor will verify their equipment is fully functional as a normal part of their daily and pre-work routine. Refer to *S3AM-321-FM1 Daily Drilling, Boring & Direct Push Equipment Inspection.*

4.6 General Health and Safety

4.6.1 Personal Protective Equipment – Refer to the *S3AM-208-PR1 Personal Protection Equipment* for best practices. These requirements may be modified or expanded in the SH&E Plan. Clothing shall be close fitting and comfortable without loose ends, straps, draw strings, belts, or otherwise unfastened parts that might catch on some rotating or translating component of the rig.

- Depending upon the hazards present, additional PPE may be required such as fire retardant clothing, specific hearing protection, respiratory protective equipment and chemical protective clothing.
- If the location has potential for underground electrical utilities to be present, workers shall ensure footwear has additional protection of shock resistant soles required (white rectangle with omega symbol).

4.6.2 Hearing Conservation – Hearing conservation program requirements may apply when working around operating equipment. Refer to *S3AM-118-PR1 Hearing Conservation*.

- Each worker shall wear noise-reducing ear protectors around operating equipment or during elevated noise levels. Distance from the elevated noise level is the primary measure of control for non-essential drilling personnel.

4.7 Drilling, Boring and Direct Push Equipment Maintenance and Inspections

4.7.1 All equipment will be inspected prior to the initiation of operations and daily during operations using the *S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection*. This inspection is the responsibility of the operator who will provide written documentation of the inspection prior to the start of drilling each day.

- Equipment that is deemed defective will immediately be repaired by a qualified person, or, if repair is not practicable, tagged "Out of Service" and sent for repairs or discarded.

4.7.2 Managers shall confirm an accurate inventory of the equipment within their operation requiring scheduled maintenance is developed. Using applicable regulations, industry standards, best practices, and manufacturer's recommendations, a maintenance schedule shall be developed with defined responsibility, required actions, and frequency. Refer to *S3AM-321-FM2 Drilling, Boring, & Direct-Push Equipment Maintenance Inventory.*

4.7.3 The maintenance program for equipment shall:

- Adhere to applicable regulations, standards, and manufacturers' specifications;
- Provide for service by appropriately qualified maintenance personnel; and,
- Require maintenance schedules and records of maintenance.

4.7.4 Employees or operators who are assigned equipment are required to review maintenance schedules for that equipment and will confirm that required maintenance has occurred or see that it is undertaken.

4.8 General Requirements

4.8.1 Excluding geoprobe activities, set up any sample tables and general work areas for employees at a safe distance from the rig.

- The recommended safe distance is the height of the fully extended mast plus 5 feet (1.5 meters), and no less than 30 feet (9.1 meters) from the rig.
- An increase to this distance may be required due to noise exposure hazards. Refer to *S3AM-118-PR1Hearing Conservation.*

4.8.2 Operation of the drilling, boring or direct-push equipment shall be restricted to the designated operator except to activate the emergency shut-off as required.

- All rotary drilling equipment shall have an emergency shut off / kill switch. The location of the switch and operation should be reviewed with all involved Employees.

4.8.3 Sit-on direct push rigs are not permitted on AECOM worksites unless the rig has been modified (in accordance with manufacturer's requirements) to be operated by remote control or the rig has been manufactured with a rollover protection system and seat belt.

4.8.4 Consult jurisdictional regulations as use of J-hooks and cat-heads may be prohibited. Examples:

- 29 CFR 1926 requires derricks and cranes to use hooks with self-closing latches and permits the use of J-hooks only for a task unrelated to this procedure (setting trusses).
- British Columbia and Saskatchewan prohibit the use of friction cat-heads**.**

4.9 Identifying the Work Area

4.9.1 Ensure the work area is adequately identified:

- Including zone around the drilling, boring, or direct push equipment, as well as fluid equipment, entry point, exit point and any excavated areas.
- Utilize barricades, signage, pylons, snow fence, etc. as appropriate.
- Implement traffic control as necessary.
- Coordinate with concurrent operations to identify their associated hazards and controls, and communicate those associated with AECOM tasks.

4.9.2 When operating near public vehicular and pedestrian traffic, the on-site personnel shall take every precaution necessary to see that the work zone is properly established, identified, and isolated from both moving traffic and passer-by pedestrians (refer to *S3AM-306-PR1 Highway and Road Work*).

4.9.3 All traffic control devices shall be installed, placed, and maintained in accordance with a Traffic Control Plan, client specifications, and / or the Manual of Uniform Traffic Control Devices and Manual of Uniform Traffic Control Devices for Canada in Canada. Traffic control devices shall consist of and not be limited to

- Directional and informational signage;
- High visibility barricades, cones, or barrels;
- Lighting; and
- Other equipment and devices as required.

4.10 Clearing Work Areas

4.10.1 In addition to any minimum requirements the drilling subcontractor may have, prior to set up, adequate site clearing and leveling shall be performed to accommodate the rig and supplies and provide a safe working area.

4.10.2 Clearing the site includes clearing the intended drilling area obstacles and of underground utilities in accordance with *S3AM-331-PR1 Underground Utilities*.

4.10.3 Drilling or probing shall not commence when tree limbs, unstable ground, or site obstructions cause unsafe tool handling conditions.

- The cleared / levelled area should be large enough to accommodate the rig and supplies.
- If the rig is positioned on a steep grade and levelling of the ground is impossible or impractical, the wheel of the transport vehicle shall be blocked and other means employed of preventing the rig from moving or toppling over.

4.11 Drilling Activities

4.11.1 Federal / State / Provincial / Territorial regulations that govern drill rig operations and exposed moving parts shall be adhered to.

4.11.2 All applicable client on-site safety procedures shall be understood and adhered to.

4.11.3 Minimum approach distances (MAD) from subsurface and overhead utilities and subsurface installations will be established including 5 feet (1.5 meters) from any subsurface utility, 7 feet (2.1 meters) from the pad surrounding any underground storage tanks, and 10 feet (3 meters) from any overhead energized electrical line (or further depending on line voltage). These approach distances are a minimum; government regulations and utility requirements may dictate a greater set back distance and should be confirmed.

4.11.4 Verify that equipment / energy is isolated when lockout is required:

- Refer to operator's manual and *S3AM-325-PR1 Lockout Tagout*.
- Ensure stop switch is activated.
- Driller is out of the seat.
- Test controls to ensure they do not engage.

4.11.5 In addition to any identified minimum requirements (as applicable, client, drilling subcontractor), the following safety measures shall be taken during drilling, boring or probing operations on site:

- The operator and helper shall be present during all active rig operations.
- Site personnel shall remain within visual contact of the rig operator.
- Hard hats, approved safety boots, safety glasses, and hearing protection shall be worn in the work zone (minimum, the radius around the rig equal to the height of the drill rig mast) of a rig.
- Gas monitoring shall be conducted as appropriate.
- Hands, feet and other body parts shall be kept away from moving parts, (e.g. hoisted, rotating, pushing, etc.) including augers, drill rods and reamers.
- When observing drilling, stand upwind of the drill rig to prevent potential exposure to vapors that may be emitted from the borehole.
- The emergency shut-off switch on the rig shall be identified to site personnel and tested on a daily basis by the operator.
- Unauthorized personnel shall be kept outside of the established work zone.
- Rig crew and other worksite personnel shall not use a cell phone while operating the drill rig or other equipment or within the rig work zone.
- Do not drive the rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast (derrick) look up to check for overhead obstructions. Refer to *S3AM-322-PR1 Overhead Lines*.

- Before raising the mast (derrick), all rig personnel (with the exception of the operator) and visitors should be cleared from the areas immediately to the rear and the sides of the mast. All rig personnel and visitors should be informed that the mast is being raised prior to raising it.
- Before the mast (derrick) of a drill rig is raised and drilling is commenced, the drill rig shall be first levelled and stabilized with levelling jacks and / or solid cribbing.
    - The drill rig shall be releveled if it settles after initial set up.
    - Lower the mast (derrick) only when the levelling jacks are down, and do not raise the levelling jack pads until the mast (derrick) is lowered completely.
- After the rig has been positioned to begin drilling, all brakes and / or locks shall be set before drilling begins.
- The operator of a rig shall only operate a drill rig from the position of the controls. The rig shall not be in operation if the operator of the rig leaves the area of the controls.
- Throwing or dropping tools shall not be permitted. All tools shall be carefully passed by hand between personnel or a hoist line should be used.
- If it is necessary to operate the rig within an enclosed area, make certain that exhaust fumes are conducted out of the area.
    - Exhaust fumes can be toxic and some cannot be detected by smell.
    - Air monitoring and, as necessary, noise monitoring shall be conducted.
- Clean mud and grease from boots before mounting a rig platform and use hand holds and railings. Watch for slippery ground when dismounting from the platform.
- During freezing weather, do not touch any metal parts of the rig with exposed flesh. Freezing of moist skin to metal can occur almost instantaneously.
- All unattended bore holes shall be adequately covered or otherwise protected to prevent rig personnel, site visitors, or animals from stepping or falling into the hole. All open bore holes shall be covered, protected, or backfilled adequately and according to Federal / State / Provincial / Territorial or local regulations on completion of the drilling project.
- When using a ladder on a rig, face the ladder and grasp either the side rails or the rungs with both hands while ascending and descending. Always use adequate fall protection and a full body harness when climbing above 6 feet (1.8 meters) of the ground. Do not attempt to use one or both hands to carry a tool while on a ladder. Use a hoist line and a tool “bucket” or a safety hook to raise or lower hand tools.

4.12 Drilling Fluid

4.12.1 Ensure drilling fluid is appropriate to the soil type and conditions to be encountered to enable smooth drilling.

4.12.2 Drilling fluid used in the boring process shall be contained at the entry and, as applicable, exit locations until recycled or removed from the site.

4.12.3 Confirm drilling fluid does not enter roadways, streams, municipal storm or sanitary sewer lines, and / or any other drainage system or body of water.

4.12.4 Monitor drilling equipment and fluid equipment for any leakage or spills. Confirm appropriate containment is in place and adequate spill response supplies are available.

4.12.5 It is important to monitor fluid flow and pressure gauges when drilling with any tooling, but it is essential when drilling with a mud motor (pump placed in the drill string to provide additional power to the bit while drilling).

4.13 Unanticipated Concrete / Debris or Void

4.13.1 The presence of subsurface installations and utilities requires special care when obstructions / refusal and voids are encountered and when unexpected absence of soil recovery occurs during

drilling operations. Other indicators of subsurface installations and utilities are the presence of warning tape, pea gravel, sand, non-indigenous material, bentonite, red concrete (indicative of electrical duct banks) and any departure from native soil or backfill.

4.13.2 If unanticipated concrete / debris is encountered and / or if a void is encountered, drilling will be immediately discontinued and the Manager notified. Drilling may only proceed with Manager or SH&E Manager approval.

4.14 Use of Manual Slide Hammer

4.14.1 The following health and safety procedures should be followed when using a manual slide hammer to install shallow injection points, drive point piezometers, and drill tools:

- Only use a manual slide hammer that either attaches directly to the point / piezometer being driven or that incorporates a cap on the point / piezometer / drill tool that prevents the slide hammer from slipping off the point / piezometer / drill tool.
- Always grasp the manual slide hammer (handles if equipped with handles) with both hands while driving the point / piezometer / drill tool.
- Never allow hands or feet to get between the manual slide hammer and the drive plate or anvil.

4.15 Use of Augers

4.15.1 The following general health and safety procedures should be followed when supervising borings with continuous flight hollow-stem augers:

- Never place hands or fingers under the bottom of an auger section when it is being hoisted over the top of the auger section in the ground or other hard surfaces such as the drill rig platform.
- Never allow feet to get under the auger section that is being hoisted.
- When augers are rotating, stay clear of the rotating auger and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.
- Use a long-handled shovel to move auger cuttings away from a rotating auger. Never use hands or feet to move cuttings away from a rotating auger.
- Do not attempt to remove earth from rotating augers. Augers should be cleaned only when the drill rig is in neutral and the augers are stopped from rotating.
- Loud noises may occur while driving split spoons. At minimum hearing protection shall be worn when driving split spoons.
- When pulling / lifting augers, a clevis pin or other closed device shall be used. Use of J-hooks is prohibited.

4.16 Attaching and Breaking Rods

4.16.1 Do not use manual tools (e.g., pipe wrenches) in combination with rotation of the drill stem. Manual tools are not designed for the load, and may break.

- The use of such tools creates a significant impact hazard for those in the work area, because they rotate with the drill stem. Manual tool use in combination with a rotating drill stem to attach or break rods is therefore prohibited.
- Manual tools may be used if the drill stem is isolated / positively disengaged.
- Mechanical means of rod separation that are permitted include:
  - Opposing hydraulic controls.
  - Rod locking devices or machine's power vice.
  - Hydraulic breakout tools.
  - Hydraulic foot clamps.

4.16.2 Rod box changes present severe crushing hazards. Operators shall ensure all crew members are clear of the machine and hoisting equipment while they are changing rod boxes.

4.17 Rotary, Sonic and Core Drilling

4.17.1 In addition to the health and safety procedures identified above, the following general health and safety procedures should be followed when supervising borings with rotary, sonic and core drilling:

- Drill rods should not be braked during lowering into the hole with drill rod chuck jaws. Drill rods should not be held or lowered into the hole with pipe wrenches.
- If a string of drill rods are accidentally or inadvertently released into the hole, do not attempt to grab the falling rods with your hands or a wrench.
- When drill rods are hoisted from the hole, they should be cleaned for safe handling with a rubber or other suitable rod wiper. Do not use hands to clean drilling fluids from drill rods.
- When drill rods are rotating, stay clear of the rotating components of the drill rig. Never reach behind or around a rotating drill rod for any reason.
- Use a long-handled shovel to move cuttings away from the top of the borehole. Never use hands or feet to move cuttings away from the borehole.
- If work shall progress over a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. The mud pit should be equipped with rough-surfaced, fitted cover panels of adequate strength to hold drill rig personnel.
- Keep away from area where drill rods are being moved or raised to the rig. Do not stand in the area where a drill rod will fall or slide if it should be dropped.
- Loud noises may occur during drilling. Hearing protection shall be worn.

4.18 Direct-push

4.18.1 The following general health and safety procedures should be followed when supervising drilling borings with direct-push drilling:

- Loud noise may occur during direct-push drilling. Appropriate hearing protection shall be worn.
- When drill rods are hoisted from the hole, they should be cleaned for safe handling with a suitable rod wiper. Do not use hands to clean drilling fluids from drill rods.
- If work shall progress over a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. The mud pit should be equipped with rough-surfaced, fitted cover panels of adequate strength to hold drill rig personnel.
- Drill rods should not be lifted and leaned unsecured against the mast. Either provide some method of securing the upper ends of the drill rod sections for safe vertical storage or lay the rods down.

4.19 Horizontal Directional Drilling

4.19.1 During surface to surface operations a 16.4’ (5 meters) safe zone shall be established and identified at both the entry and exit locations; no personnel are permitted to be within this zone unless the drill is locked out and the operator is out of the seat.

4.19.2 Machine shall be locked out before entering an excavation, changing tools, adding or removing drill stem or doing any other work on tools or the drill stem at the exit end of the bore.

4.19.3 A tracking head shall be installed on the drill stem:

4.19.4 Assemble drill head using components appropriate to the soil conditions to be encountered (e.g. nozzle, bit, beacon housing, etc.).

4.19.5 Ensure all personnel are clear of the bore entry point (outside of identified work zone).

4.19.6 At all times two way communication will be maintained at entrance and exit points using two way radios or equally effective communication means. If at any time communication is lost, all work will be stopped until communication is re-established

4.19.7 Locate drill head with tracking device at least every half-length of pipe. Adjust direction as necessary to follow the intended bore path.

4.19.8 Any drilling fluid returning to the surface shall be cleaned up promptly.

4.19.9 Drill pipe should exit the bore at an angle of 5 to 10° from the ground surface.

4.19.10 Turn off fluid flow as soon as drill head emerges.

4.19.11 Lockout machine and remove drill head using appropriate breakout tools.

4.19.12 Select and attach a reamer that allows the return of drilling fluids and cuttings, to reduce frictional pullback forces, and to allow for bend radius of the pipe. Reamer shall be:

- The smaller of 1.5 times the outside diameter (O.D.) or 12 inches (300mm) larger than the diameter of the product pipe.
- A diameter less than 1.5 times the diameter of the product may be necessary in collapsing soil formations.
- Reamed diameter may need to be increased by up to 25% if substantial swelling of the soil is expected to occur.

4.19.13 All personnel shall clear the trench or the designated surface zone (16.4 feet [5 meters]) once the reamer is attached. Operator shall only reverse lockout and commence pullback when communication is received from personnel on exit hole side and operator has confirmed the message.

4.19.14 Personnel on exit hole side shall ensure reamer is pulled the entire way back to the exit hole.

- If rotation is started when drill rod and reamer are away from the exit hole, very fast sideways movement of the rod and reamer can occur.
- Larger reamers and longer lengths of exposed drill rod increase the speed and distance of this movement.

4.19.15 If working with trailing drill stem, swivels shall be verified as lubricated and rotating freely by hand prior to use:

- A freely moving swivel prevents trailing drill stem or product from rotating / whipping.
- If the swivel does not move freely by hand it shall be removed from service and repaired or replaced.
- Only use swivels with limited articulation to prevent whipping or cranking action between the reamer and trailing drill pipe or product.

4.19.16 It is important to clean and lubricate the tool and drill stem joint threads before each use.

4.19.17 Any individual drill pipes that are bent or damaged shall be immediately taken out of service.

4.19.18 Occasionally change the order of the lead drill pipe (i.e. move the lead pipe to the end of the stem, or other pipe rotation procedures) to extend drill stem life.

4.19.19 Operator should avoid stalling the pipe rotation to avoid stress damage from shock loading.

4.20 Drilling at Potential MEC / UXO Sites

4.20.1 If the project site is suspected of containing munitions and explosives of concern (MEC) or unexploded ordnance (UXO), the UXO team will conduct a reconnaissance and MEC / UXO avoidance to provide clear access routes to each site before drilling crews enter the area. The following procedures will be implemented:

- Drilling operations on an MEC / UXO site will not be conducted until a complete plan for the site is prepared and approved by the AECOM UXO Safety Officer. MEC / UXO avoidance shall be conducted during drilling operations on known or suspect MEC / UXO sites.
- The UXO team will identify and distinctly mark the boundaries of a clear approach path for the drilling crews, vehicles, and equipment to enter the site. This path will be, at a minimum, twice the width of the widest vehicle. No personnel will be allowed outside any marked boundary.
- If MEC / UXO is encountered on the ground surface, the UXO team will clearly mark the area where it is found, report it to the proper authorities, and divert the approach path around it.
- The UXO team will conduct an access survey using the appropriate geophysical instrument over the approach path for avoidance of MEC / UXO that may be in the subsurface. If a magnetic anomaly is encountered, it will be assumed to be MEC / UXO, and the approach path will be diverted around the anomaly. UXO personnel only will operate the appropriate geophysical instrument and identify MEC / UXO.
- An incremental geophysical survey of the drill-hole location(s) will be initially accomplished by the UXO team using a hand auger to install a pilot hole. If MEC / UXO is encountered or an anomaly cannot be positively identified as inert material, Hazardous, Toxic, and Radioactive Waste (HTRW) sampling personnel will select a new drill-hole location.
- Once the surface of a drilling site has been cleared and a pilot hole established as described above, the drilling contractor will be notified that the site is available for subsurface drilling.

4.21 Movement and Transport of Drilling, Boring or Direct-Push Equipment

4.21.1 Personnel transporting equipment shall be properly licensed and shall operate the vehicle according to Federal / State / Provincial / Territorial, and local regulations. Refer to *S3AM-005-PR1 Driving* and *S3AM-320-PR1 Commercial Motor Vehicles*.

4.21.2 Confirm the traveling height (overhead clearance), width, length and weight of the equipment with the carrier. Identify highway and bridge load, width and overhead limits, to confirm these limits are not exceeded and with adequate margin.

4.21.3 Allow for overhang of any drilling, boring or direct-push equipment when cornering or approaching other vehicles or structures.

4.21.4 Be aware that the canopies of service stations and motels are often too low for equipment loaded on a trailer to clear

4.21.5 Watch for low hanging electrical lines, particularly at the entrances to drilling sites or restaurants, motels, other commercial sites.

4.21.6 Never travel on a street, road, or highway with any part of the drilling, boring or direct-push equipment in a raised or partially raised position.

4.21.7 Remove all ignition keys if rig is left unattended unless client requirements specify that the keys remain in the ignition switch at all times.

4.21.8 Before moving a rig on location, the operator shall do the following:

- To the extent practical, walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles.
- Check the brakes of the truck / carrier, especially if the terrain along the route of travel is rough or sloped.
- Discharge all passengers before moving on rough or steep terrain.

4.21.9 Engage the front axle (on 4x4, 6x6, etc., vehicles) before traversing rough or steep terrain

4.21.10 Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel becomes necessary, the operator shall conservatively evaluate the ability of the rig to remain upright while on the hill or embankment. The possibility shall be considered that the presence of

drilling tools on the rig may reduce the ability of the rig to remain upright (raises the center of mass of the rig).

4.21.11 Logs, ditches, road curbs, and other long and horizontal obstacles should be approached and driven over squarely, not at an angle.

4.21.12 When close lateral or overhead clearance is encountered, or when backing up, the driver of the rig shall be guided by another person on the ground.

4.21.13 Loads on the drill rig and truck shall be properly stored while the truck is moving, and the mast shall be in the fully lowered position.

4.22 Loading and Unloading

4.22.1 Consult applicable manufacturer's recommendations for loading and unloading of the equipment.

4.22.2 Use ramps of adequate design that are solid and substantial enough to bear the weight of the rig with carrier, including tools.

4.22.3 Load and unload on level ground.

4.22.4 Use the assistance of someone on the ground as a guide.

4.22.5 Check the brakes on the rig carrier before approaching loading ramps.

4.22.6 Distribute the weight of the rig, carrier, and tools on the trailer so that the center of weight is approximately on the centerline of the trailer and so that some of the trailer load is transferred to the height of the pulling vehicle. Refer to the trailer manufacturer's weight distribution recommendations.

4.22.7 The rig and tools should be secured to the hauling vehicle with ties, chains, and / or load binders of adequate capacity.

## 5.0 Records

5.1 All employee training files shall be maintained in accordance with *S3AM-003PR1 SH&E Training*.

5.2 Completed inspections and maintenance inventories shall be maintained the site or project files.

## 6.0 Attachments

6.1 S3AM-321-ATT1 Core Drilling Machine

6.2 S3AM-321-ATT2 Pre-Drilling, Boring, & Direct-Push Probing Flow Chart

6.3 S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection

6.4 S3AM-321-FM2 Drilling, Boring & Direct-Push Equipment Maintenance Inventory

Americas

# Overhead Lines & Obstructions

S3AM-322-PR1

## 1.0 Purpose and Scope

1.1 Provides the safe work requirements to be observed where overhead obstructions (e.g., cable trays, pipe racks, etc.), overhead utilities, or other lines are present at a work location, including, but not limited to electric power lines, electrical apparatus, or any energized (exposed or insulted) parts, communication wires, or any other overhead wire or cable.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

## 2.0 Terms and Definitions

2.1 **Arc Flash Hazard** – A dangerous condition associated with the possible release of energy caused by and electric arc. Arc flash is the light and heat produced from an electric arc supplied with sufficient electrical energy to cause substantial damage, harm, fire, or injury.

2.2 **Electrical Hazard** – A dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or blast.

2.3 **Minimum Approach Distance (MAD)** – The MAD is the closest distance any employee or any part of the operating equipment is permitted to approach an energized or a grounded object.

2.4 **Qualified Person (Electrical Transmission and Distribution) –** A person trained and knowledgeable in the construction and operation of electrical transmission and distribution equipment or a specific work method, and has been trained to recognize and avoid electrical hazards that might be present with respect to that equipment or work method.

2.5 **Types of Overhead Lines / Obstructions (examples)**:

- Overhead electric power lines
- Structural cable supports
- Guy wires
- Cable television / communication lines
- Cable Trays
- Pipe Racks
- Low Clearance Overpasses

## 3.0 References

3.1 S3AM-004 PR1 Incident Reporting, Notifications & Investigation

3.2 S3AM-010-PR1 Emergency Response Planning

3.3 S3AM-209-PR1 Risk Assessment & Management

3.4 S3AM-302-PR1 Electrical Safety

3.5 S3AM-303-PR1 Excavation

## 4.0 Procedure

4.1 Roles & Responsibilities

4.1.1 **Manager**

- Identify conditions where overhead electric power lines and other overhead obstructions may be present and outline what is required in the SH&E Plan and Task Hazard Assessments. Refer to the *S3AM-209-PR1 Risk Assessment & Management*.
- Confirm electrical and communication lines, and as appropriate other overhead obstructions, are identified on all site and project drawings.
- Coordinate and communicate with overhead electrical line owner or operator to identify and implement appropriate control measures.
    - Provide adequate advance notification to the Overhead Electrical Line Owner / Operator to allow for insulation or isolation and grounding of the line(s) if required.
    - Confirm the Overhead Electrical Line Owner / Operator(s) are fully informed as to when the operations are to begin, end and when any location changes are planned if applicable.
- Confirm Employees are trained as required for the scope of work and associated hazards.
- Coordinate and communicate with subcontractors or employees working around overhead electric power lines and as applicable, other overhead obstructions.
- Confirm the *S3AM-322-FM1 Overhead Electric power lines Acknowledgement* is completed by concurrent operations working around overhead electric power lines on the worksite.

4.1.2 **Safety Health & Environment (SH&E) Manager**

- Assist and support the Manager in planning and responding to concerns regarding the exposure to overhead electric power lines.

4.1.3 **Employees**

- Maintain current training required for the scope of work and associated hazards.
- Inform the Manager of location conditions that may expose risks to overhead electric power lines.
- Comply with established minimum approach distances.

4.2 Training

4.2.1 The Manager shall confirm all Employees are oriented to the SH&E Plan and Task Hazard Assessment (THA) process, in accordance with *S3AM-209-PR1 Risk Assessment & Management*.

4.2.2 Confirm training requirements were met prior to work starting.

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- Employee orientation shall include the Location Specific Emergency Response Plan.
- Proof of training and orientation shall be documented and retained in the project files.

4.2.3 Managers shall confirm that each Employee has received training required for the scope of work and associated hazards in accordance with *S3AM-003-PR1 SH&E Training*.

4.2.4 Additional training requirements may include, but are not limited to:

- The limitations of an insulating link / device, proximity alarm, and range control (and similar) device, if used.

- Grounding and bonding procedures.
- Client specific requirements

4.3 General Requirements

4.3.1 The AECOM Manager or supervisor and employees shall perform a walk-thru of the work site and / or review of the work area / travel route to identify the overhead electric power lines and any other overhead obstructions that could be impacted by the work. Consider high profile equipment, equipment in transport, swing radius of equipment, potential for shifting loads, etc. AECOM personnel may be accompanied by other applicable personnel (e.g. client representatives, contractors operating concurrently, etc.).

4.3.2 The location or project specific SH&E Plan shall identify all overhead line hazards and provide suitable methods of elimination or control. All involved or affected workers shall review the SH&E Plan to confirm proper communication of the overhead line hazards and awareness of the control measures associated with their work.

4.3.3 Assess applicable factors such as, but not limited to:

- Scope of work (e.g. hoisting materials, excavation, grubbing, etc.).
- Transportation route.
- Hoisting, excavating, or other equipment to be operated.
- Height, placement, and reach of equipment.
- Equipment or material loading / unloading.
- Location(s) of electric power lines, communication lines, guy wires, etc.
- Worker training and experience.
- Soil or ground condition and environmental conditions.
- Interruptions to electrical services.
- Hazard to public.
- Use of ladders.
- Pipe and other conducting materials.
- Notification of electric utility owner.
- Changing conditions.
- Communication of all hazards to all workers including contractors, sub-contractors, and concurrent operations.

4.3.4 Task Hazards Assessments (THAs) shall be completed to record the hazards and control measures specific to the task, including those related to overhead line and obstructions hazards, prior to undertaking assigned tasks. THAs shall be reviewed and signed by all workers involved in the specific task.

4.3.5 Should adverse weather conditions cause the work associated with overhead lines to be unsafe, the activities shall be discontinued.

4.3.6 Managers or designated employees shall formally notify all concurrent operations, or any others who may not have had reason to review and sign the related SH&E Plan or THAs, of work that is to be done in the vicinity of overhead lines at distances less than 50 feet (15.25 meters), and for non-electrical obstructions, at distances less than 10 feet (3.05 meters) if appropriate to the obstruction's potential hazards, and obtain the operator's assistance in protecting workers involved.

- Formal notification may be accomplished through a review of the SH&E Plan or THAs by the concurrent operator and associated personnel, as evidenced by signing the respective document's acknowledgement.
- Alternately, the concurrent operations may acknowledge having reviewed AECOM's procedures with a separate acknowledgment form. *S3AM-322-FM1 Overhead Electric Power Lines Acknowledgement Form* or equivalent may be used.
- Prior to equipment operation within 10 feet (3.05 meters) of non-electrical obstructions, as appropriate to potential hazards associated with the obstruction, the Owner/Operator should be contacted to obtain specific details regarding the obstruction such as piping or tray contents,

4.3.7 Overhead lines are presumed to be energized unless the Overhead Electrical Line Owner / Operator confirms that the overhead line has been, and continues to be de-energized and visibly grounded at the worksite.

4.3.8 Overhead lines are presumed to be uninsulated unless the Overhead Electrical Line Owner / Operator or a registered Professional Engineer who is a Qualified Person with respect to electrical power transmission and distribution confirms that a line is insulated.

4.3.9 Confirm accurate measurement of load heights, maximum equipment radius and height or reach of any other equipment that could potentially encroach on the safe limit of approach for the overhead electrical line,guy wires, or other applicable overhead obstructions.

- The height of all applicable overhead lines and obstructions that pose contact or encroachment potential shall be determined prior to work commencing.
- The height of electric power lines may only be determined by the client, utility company professional, or by using an approved electronic measuring device.
- Awareness shall be maintained for any elements that could affect clearance (e.g. snow pack, ice or snow weighing down lines, excessive heat causing sag, etc.).
- Caution shall be exercised when working or travelling near overhead lines having long spans, since they tend to be more prone to lateral swing in response to the wind and can present a contact hazard.
- All low hanging communication lines in close proximity to energized lines shall be clearly identified as *Encroaching on Energized Lines.*

4.3.10 Managers shall contact the overhead owner/operator (i.e. local utility company) if work is to be done or before equipment is operated within 50 feet (15.25 meters) of an energized overhead line, to determine the voltage of the overhead line and establish the appropriate MAD.

- All inquiries regarding electric utilities shall be made in writing and a written confirmation of the outage / isolation shall be received by the appropriate AECOM Manager prior to the start of the task that may impact the utility.

4.3.11 Until the voltage of the overhead electrical line is known and the MAD established, an exclusion zone shall be created at ground level beneath and 50 feet (15 meters) perpendicular to the overhead electric power lines on each side.

- The exclusion zone shall be demarcated with visual indicators (e.g., signage, flagging, paint, cones). No equipment shall enter the exclusion zone without approval from AECOM management.
- Unqualified employees shall maintain a safe clearance distance in accordance with the established MAD when working in an elevated position near energized overhead lines. For additional information associated with Qualified Employees refer to *S3AM-302-PR1 Electrical Safety*.

4.3.12 The Minimum Approach Distance (MAD) as it relates to Voltage varies from jurisdiction to jurisdiction. The MAD or the regulatory minimum distance requirements, whichever is more stringent, shall be maintained. The below chart shows the Phase-to-Phase voltage rating voltages in kilovolts and the MADs applicable to all AECOM operations:

**Minimum Approach Distances (MAD)**

| Voltage Range (Kilovolts) (Phase-to-Phase) | Minimum Approach Distance (MAD) in Feet (Meters) |
|---|---|
| **Personnel shall allow for equipment movement and electrical line swaying when establishing a M.A.D.** | |
| 0 – 50 KV | 10 (3) |
| Over 50 – 200 KV | 15 (5) |
| Over 200 – 350 KV | 20 (6) |
| Over 350 – 500 KV | 25 (8) |
| Over 500 – 750 KV | 35 (11) |
| Over 750 – 1,000 KV | 45 (14) |
| **Note: This requirement shall apply except where client, local, or governmental regulations are more stringent.** | |

Source: American National Standards Institute, Publication B30.5.

4.3.13 An appropriate distance shall be kept between equipment, its occupants, their tools and energized overhead lines, electrical apparatus, or any energized parts.

4.3.14 These minimum approach distances do not apply to a load, equipment, or building that is transported under energized overhead power lines if the total height, including equipment transporting it, is less than 13.5 feet (4.15 meters).

- If the travelling equipment, including load, is over 4.15m (13.62ft) a transportation permit shall be acquired from the appropriate jurisdiction to travel on any public road or highway.
    - Consult local jurisdiction as some US states may use heights of up to 4.45m (14.6ft).
    - Notification of appropriate utility companies may be required in conjunction with the transportation permit. Jurisdictional requirements shall be verified prior to transport.
    - Route shall be checked for clearance of overhead electrical and communication lines prior to transport.
    - A designated signaler will be utilized when the height of the equipment, buildings, tractor / trailers or any other transport equipment travelling under an overhead electrical line is greater than 4.15m (13.62ft).

4.3.15 Employees shall not place earth or other material under or beside an electrical overhead line if doing so reduces the safe clearance to less than 50 feet (15.25 meters) or, if appropriate to potential hazards associated with other types of overhead obstruction, less than 10 feet (3.05 meters). To maintain a safe distance:

- Install warning devices and signs (hang a sign from and mark all guy wires to warn traffic of low clearance; provide warning signage for all overhead services).
- Install telescopic, nonconductive posts and flagging across right-of-way at the minimum allowable clearance as allowed by regulations for the line voltage.
- Position signs or other devices to determine the “Danger Zone”.

- Inform all job site personnel of the danger zone and the safe distances required.
- Beware of atmospheric conditions, such as temperature, humidity, and wind that may dictate more stringent safety procedures.

4.3.16 If employees are to climb or perform work on poles or towers, the structures shall be confirmed as capable of withstanding the weight and activity without failure.

4.3.17 If holes are dug for poles or foundations for structures, appropriate measures shall be taken to prevent inadvertent entry by personnel or equipment. Refer to *S3AM-303-PR1 Excavation*.

4.3.18 Operation of heavy equipment and cranes in areas with overhead lines represents a significant arc flash and electrical hazard to all personnel on the job site.

- Accidental contact with an energized overhead line or arcing between a high power line and grounded equipment, can cause harm to nearby equipment operators or ground personnel and damage to power transmission systems and / or operating equipment.
- Equipment will be repositioned and blocked so that no part, including cables, can come within the established minimum clearances.

4.3.19 Gravel trucks, cranes, boom trucks, etc. shall retract, stow and lower boxes, outriggers, booms, etc. to the travel position prior to entering municipal and client owned roads (e.g. leaving plant sites, work over rig sites, battery sites, and storage yards) and any time travel may put the equipment within the MAD of an electrical line.

4.3.20 When a signal person is required, the individual shall wear reflective striping (coveralls or vest) and carry an air horn or other appropriate means of emergency communication.

4.3.21 The signal person shall be aware of the potential electrical line hazards, be verified as competent by their supervisor and not have any other duties while acting as the signal person.

4.3.22 The signal person shall remain outside the MAD and in a position that allows for monitoring of equipment or loads to prevent encroachment on the MAD.

4.3.23 Signs, pylons, high visibility tape and / or signalers shall not be removed until the last piece of AECOM equipment has traveled under the overhead electrical line.

4.4 Minimum Approach Distance (MAD) Reduction

4.4.1 Where any work task will not allow the MAD to be maintained, an alternate means of protection shall be implemented by the Manager and approved by the SH&E Manager. In order of preference, acceptable procedures are:

- De-energize the overhead line(s) / lockout by local utility authorities; or
- Implement alternative procedures as identified by the Overhead Electrical Line Owner / Operator or a registered professional engineer.

4.4.2 De-energize Overhead Lines

- Elimination of electrical power provides the most acceptable means of ensuring safety of personnel. While temporary site overhead lines are often under the control of the site manager (and can be de-energized locally), electrical distribution and transmission lines can be de-energized only by the Overhead Electrical Line Owner / Operator. De-energizing of an overhead line often requires advance coordination with the Overhead Electrical Line Owner / Operator. At least one week advance notice should be provided.
- Managers shall confirm with the utility Overhead Electrical Line Owner / Operator that the overhead line has been de-energized and visibly grounded at the job site.

4.4.3 Alternative Procedures

- Managers may implement alternative procedures to prevent arc flash and electrical contact. These procedures shall be identified by the Overhead Electrical Line Owner / Operator or a registered Professional Engineer who is a Qualified Person with respect to electrical power transmission and distribution.
- A planning meeting with the Manager, SH&E Manager and the Overhead Electrical Line Owner / Operator (or registered Professional Engineer) shall be held to determine the most effective alternative procedures.
- Alternative procedures shall meet all client, local and governmental regulatory requirements.
- The work will be conducted by qualified and competent individuals, following the alternative written safe work procedures. All others are restricted from entering the MAD.
- Insulating Barriers shall be rated for the voltage line being guarded. These barriers may not be part of or attached to the equipment. The MAD shall only be reduced within the designed working dimensions of the insulating barrier. This determination shall be made by a Qualified Person in accordance with local or governmental requirements for work practices near energized equipment.
- Consult *S3AM-302-PR1 Electrical Safety* procedures to properly ground equipment and for limitations of grounding.
- Dedicated Line Spotters shall be trained to enable them to effectively perform their task, including training on the applicable local and governmental regulations.
- No work that encroaches on an energized power line will be completed outside of daylight hours.

4.5 Additional Safety Measures.

4.5.1 When equipment shall repeatedly travel beneath electric power lines, a route shall be plainly marked and “rider poles” of non-conductive material shall be erected on each side to confirm equipment structures are lowered into a safe position.

- 20” X 28” (50.8cm X 71.12cm) Danger Overhead Power Lines signs, which are highly visible, shall be erected at a height of 1.8 meters (6ft) on each side of the electrical line. A combination of pylons and high visibility tape shall be placed underneath the electrical line.
- These signs shall be in plain view of equipment traveling in either direction, but no closer than the MAD.
- If physical guards (i.e. goal posts, rider poles) are used, the guards shall be of non-conductive material and consist of a pole on each side of the approach connected by a rope.
- The poles will be placed at the MAD from and on each side of the electrical line. The ropes will be set at a height, which will maintain the MAD from the electrical line.

4.5.2 Watch for uneven ground that may cause vehicles and equipment to weave, bob, or bounce.

4.5.3 The following additional safety measures shall be implemented as needed when working around energized power lines:

- Provide equipment with proximity warning devices. These provide an audible alarm if any part of the equipment gets too close to a line.
- Install ground safety stops. These prevent vehicles from accidentally entering hazardous areas.
- Equip cranes with a boom-cage guard. This prevents the boom from becoming energized if an electrical line is contacted.

- Utilize insulated links and polypropylene tag lines. These prevent the transmission of electricity to loads or tag line handlers if an electrical line is contacted.

  NOTE: These additional safeguards are intended as supplemental protection. Use of these measures is not permissible as a substitute for maintaining the safe working distance or implementation of the procedures outlined in this document.

4.6 Emergency Planning

4.6.1 Managers shall complete a location specific emergency response plan as part of their location or project specific SH&E Plan for all operations during which equipment is operated within 50 feet (15.25 meters) of an energized overhead electrical line or conductor. Refer to *S3AM-010-PR1 Emergency Response Planning*. This plan shall identify the following information:

- The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab.
- The safest means of evacuating from equipment that may be energized.
- The potentially energized zone around the equipment.
- The need for crew in the area to avoid approaching or touching the equipment and the load.
- The means to de-energize the electrical line or live conductor.
- The contact information for the utility Overhead Electrical Line Owner / Operator and emergency services.

4.6.2 In the event of an incident, the Employee shall report it in accordance with *S3AM-004 PR1 Incident Reporting, Notifications & Investigation.*

4.6.3 All damaged utilities shall be repaired by a qualified and / or licensed professional.

## 5.0 Records

5.1 Retain the Overhead Electric power lines Acknowledgement forms and any document related to requests of and confirmation from the Overhead Electrical Line Owner / Operator in the project files. Documentation of employee training completed shall be retained in accordance with *S3AM-003-PR1 SH&E Training*.

## 6.0 Attachments

6.1 S3AM-322-FM1 Overhead Electric Power Lines Acknowledgement Form

Americas

# Underground Utilities

S3AM-331-PR1

## 1.0 Purpose and Scope

1.1 Provides procedures designed to help prevent injuries to personnel working on the location and pedestrians, property damage, and adverse environmental impact as a result of potential hazards associated with encountering underground utilities, subsurface installations, and potential overhead hazards.

1.2 Provides the minimum requirements to be followed for underground work (e.g., excavations, drilling, boring, and probing work) to ensure that underground installations, and subsurface structures, are identified properly before work commences.

1.3 This procedure applies to all Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

1.4 The Manager is responsible for meeting all the requirements in this procedure.

1.5 AECOM's clients may have specific procedures which shall be followed to identify and map utility and subsurface structures on their properties or facilities. Provided the client's procedures meet or exceed those of AECOM, approval shall be obtained from the Manager and the SH&E Manager to follow the client's procedures.



## 2.0 Terms and Definitions

2.1 **Underground Utilities –** All utility systems located beneath grade level, including, but not limited to, gas, electrical, water, compressed air, sewage, signaling and communications, etc.

2.2 **Clearance** – includes the following:

- The positive locating of underground utilities or subsurface installations in or near the work area.
- A signed statement by an appropriate representative attesting to the location of underground utilities and/or the positive de-energizing (including lockout) and testing of electrical utilities.

2.3 **Ground Disturbance (GD) –** Any indentation, interruption, intrusion, excavation, construction, or other activity in the earth's surface as a result of work that results in the penetration of the ground.

2.4 **Hand Clearance / Tolerance Zone –** The area on either side of the locate marks of a utility that shall be maintained in order to expose the utility through the use of non-destructive ground disturbance techniques acceptable to the owner of the buried utility and applicable jurisdictional requirements. Visual exposure is required before mechanical excavation equipment may be used.

2.5 **Intrusive Activities –** Examples: Excavation of soil borings, installations of monitoring wells, installation of soil gas sampling probes, excavation of test pits/trenches or other man-made cuts, cavity, trench or depression in an earth surface formed by earth removal.

2.6 **Non-Destructive Ground Disturbance Technique –** A safe and acceptable excavation method that is used to visually expose an underground utility without causing damage. Non-destructive ground disturbance techniques may include, but are not limited to:

- Hand digging.
- Use of non-conductive tools.
- Hydro-vacuum.

2.7 **Subsurface Installation –** Examples: Subterranean tunnels, underground parking garages and other structures beneath the surface.

2.8 **Utility Strikes –** Unplanned contact with utilities resulting in damage to the utility or its protective coating.

## 3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-303-PR1 Excavation

3.3 S3AM-321-PR1 Drilling, Boring & Direct-Push Probing

## 4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Administer this procedure and the development of the SH&E Plan.
- Confirm the appropriate equipment and materials are available to conduct the underground utility and/or subsurface installation clearance.
- Confirm all employees involved and affected by the task review the SH&E Plan and Task Hazard Assessment (THA) prior to work commencing
- Authorize work to proceed using the *S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist*.
- Confirm that employees conducting underground utilities and subsurface clearance processes possess all required training, registrations or certifications.
- Provide authorization (with the concurrence of the Site Supervisor and SH&E Manager) for work to resume if interrupted due to unexpected conditions or events.

4.1.2 **Safety, Health & Environment (SH&E) Manager**

- Assist AECOM management as needed by providing guidance and clarification as to issues that may arise.
- Review the SH&E Plan to confirm compliance with jurisdictional regulations. Provide technical guidance as needed when a variance is pursued related to this procedure.

4.1.3 **Employees**

- Maintain training as appropriate to the work to be completed (e.g. ground disturbance, lockout tagout, equipment operation, etc.). Refer to *S3AM-003-PR1 SH&E Training*.
- Review the SH&E Plan and Task Hazard Assessment (THA) prior to work commencing.
- As appropriate to the anticipated or encountered hazards and as addressed in the applicable planning documentation, utilize appropriate personal protective equipment (PPE) and applicable training, practices and operating procedures.
- Immediately notify the Manager of any unanticipated conditions or events. If assigned equipment, perform appropriate inspections and confirmations of maintenance and/or repairs.

4.2 Training

4.2.1 All on-site employees involved with the underground utility and subsurface identification and associated clearance process shall be trained, at a minimum, in these procedures.

4.2.2 Employees shall complete all required training associated with their tasks in accordance with the SH&E Training Matrix and any training assessments developed at the business group.

- Refer to *S3AM-003-PR1 SH&E Training.*
- This training may include, but is not limited to, Excavation / Trenching (Ground Disturbance), HAZWOPER, Petroleum Safety Training (or Construction Safety Training), and H2S Alive as appropriate.

4.2.3 As applicable, employees shall receive client-required training.

4.3 Planning

4.3.1 Health and Safety Plan – At a minimum, a SH&E Plan and task hazard assessments (THAs) shall be prepared prior to any underground utilities and subsurface installations clearance activities.

- The SH&E Plan will address any required environmental monitoring including gas monitoring, dust, noise, metals, radiation or other monitoring as may be appropriate for site conditions.
- Employees shall comply with all SH&E Plan requirements.
- The location specific emergency response plan shall be in place, contain procedures applicable to the potential emergencies presented by the operations, and be reviewed with all personnel potentially affected.

4.3.2 *S3AM-331-ATT2 Underground Utilities & Subsurface Installation Clearance Flow Chart* provides a summary of the key requirements addressed in this procedure.

4.3.3 Underground utilities and subsurface installations shall be investigated as being present, including the following, but not limited to:

- Steam, gas and electric.
- Sewer and water.
- Subterranean tunnels.
- Fibre optics (note: routine geophysical surveys will not identify fibre optic cables).
- Traffic control cables.

4.3.4 Location of underground utilities and subsurface installations will be confirmed by cross-referencing available information:

- Maps, as-built drawings and issued for construction (IFC) drawings.
- Plot plans, permits, crossing/encroachment agreements.
- One-Call information, locator and provided surveys.
- Private utility information, locator and provided surveys (e.g. ground penetrating radar (GPR), electromagnetic, etc.).
- Owner supplied documentation.
- Site walks.

4.3.5 As applicable, emergency shut-off locations of utilities shall be verified before work activities commence.

4.3.6 Jurisdictional, land owner, client and utility owner requirements shall be consulted to determine the minimum search zone dimensions and appropriate clearance distances.

4.3.7 As necessary and if possible, adjust locations of excavations or intrusive subsurface work away from subsurface utilities and installations

4.3.8 Prior to any excavation or intrusive subsurface work, the *S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist* shall be completed. The form shall be reviewed and signed by the Manager.

- If the answer to any question in Part 1 of the checklist is “No” or “N/A”, no ground disturbance may take place without review by the Manager, in consultation with SH&E Manager, of the circumstances related to the particular item. The Manager shall initial beside each “No” or “N/A” item to indicate review and authorization.

4.4 Permits, Notifications and Access Agreements

4.4.1 Any required notifications shall be provided within the appropriate timeframe to the applicable organization (e.g. owner, utility company, agency, governing body, etc.).

4.4.2 All applicable permits (e.g. client, government, working near rail road, etc.) will be identified, obtained, and adhered to.

4.4.3 All access agreements will be obtained and adhered to.

4.5 Locating Underground Utilities and Subsurface Installations

4.5.1 Utilize the appropriate call/click-before-you-dig provider. Refer to *S3AM-331-ATT1 One-Call System*.

4.5.2 Federal/State/Provincial/Territorial and other “One Call” providers shall be contacted at least two working days and no more than ten working days prior to commencing the ground disturbance. Jurisdictional requirements shall be consulted to verify the appropriate advance notice. (e.g. 24 hours, two full working days, three to ten business days, etc.).

4.5.3 If the location of proposed excavation or intrusive subsurface work cannot be clearly and adequately identified, the route and/or area of the proposed ground disturbance shall be identified using white flags, paint or stakes prior to the arrival of the locator. Consult jurisdictional requirements as white-lining may be a mandatory requirement on all ground disturbances.

4.5.4 One Call providers shall appropriately identify and mark the subsurface utilities or installations, or otherwise provide written notification they do not have any facilities near the proposed subsurface/intrusive locations.

4.5.5 Confirm all circuits were on during subsurface checks if the checks were for identifying energized lines (e.g. circuits on timers or light sensing switches).

4.5.6 Areas that have a high density of sub-surface facilities may require a secondary locate by another independent locator to verify locations identified by the first locator.

4.6 Private Utility Locating

4.6.1 One Call services may not be available in various non-urban locations. Private utility locating companies shall be utilized to identify and located any underground utilities or subsurface installations.

4.6.2 Be aware urban areas (e.g. city or town) may have subsurface installations (e.g. underground garages) and utilities (e.g. public water, sewer, and gas pipelines) that are not covered by one-call systems.

- These subsurface installations and utilities require additional investigation and diligence beyond the one-call system.
- Additional investigation and diligence beyond the one-call system is also recommended for non-urban areas.

4.6.3 In urban areas, private utility locating companies shall be called to identify and locate, through geophysical surveys and other means, the presence of private utilities installed by the property owner (e.g. irrigation systems) and to verify the presence of public utilities on the properties.

- Hand clearance / tolerance zones shall be observed in urban areas and utilities exposed through the use of non-destructive techniques in accordance with requirements of the applicable jurisdiction and utility owner.

4.6.4 Observance of hand clearance / tolerance zones and utility exposure using non-destructive techniques is also recommended for non-urban areas and may be required by the applicable jurisdiction.

4.6.5 Warning tape, pea gravel, sand, non-indigenous material, bentonite, red concrete (indicative of electrical duct banks) and any departure from native soil or backfill may be evidence of the presence of subsurface installations and utilities.

4.7 Surface Markings

4.7.1 Once the underground installation has been identified, proper surface markings shall be made in accordance with the guidelines from the One-Call System (refer to S3AM-331-ATT1 ), guidance contained in this procedure or as contract-specified.

4.7.2 Color-coded surface marks (paints or similar coatings) shall be used to indicate the type, location, and route of buried installations. Additionally, to increase visibility, color-coded vertical markers (temporary stakes or flags) shall supplement surface marks.

4.7.3 All marks and markers shall indicate the name, initials, or logo of the company that owns or operates the installation and the width of the installation if it is greater than 2 inches.

4.7.4 If the surface over the buried installation is to be removed, supplemental offset marking shall be used. Offset markings shall be on a uniform alignment and shall clearly indicate that the actual installation is a specific distance away.

4.7.5 Locate marks shall be re-verified as per jurisdictional requirements or no later than 14 days after the previous locate was completed, whichever interval is shorter. These locate time intervals shall be maintained for the duration of the ground disturbance.

- If the work is interrupted during the determined lifespan or work does not commence during the applicable lifespan, a new locate shall be performed.
- Jurisdictional provisions may allow for an extension to the lifespan of the locate marks, however certain conditions may need to be met. (e.g. activities uninterrupted)
- If locate marks are moved or destroyed the location of the buried facilities shall be re-established.

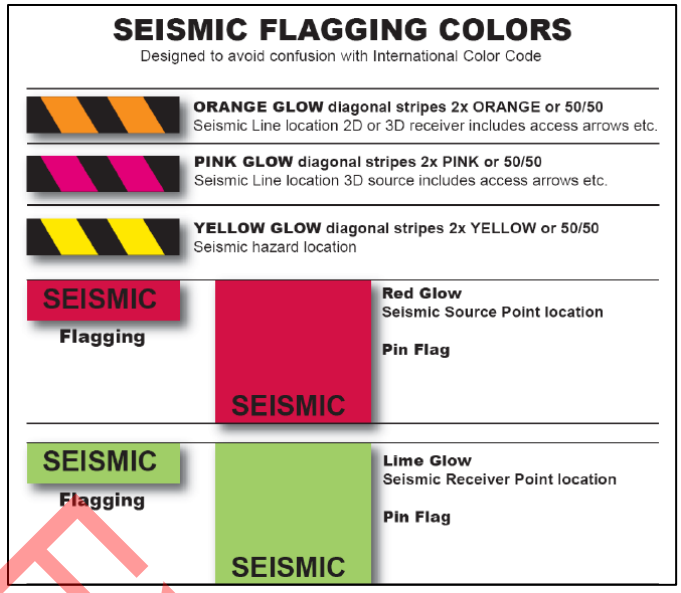
4.8 Uniform Color Coding

4.8.1 The colors and corresponding installation type are as follows unless otherwise contract-specified:

AMERICAN PUBLIC WORKS ASSOCIATION – APWA
Color Coding for Marking of Buried Facilities

| | |
|---|---|
| **White** | **Proposed Ground Disturbance Area** |
| **Pink** | **Temporary Survey Markings** |
| **Red** | **Electric Power Lines, Cables, Conduit and Lighting Cables** |
| **Yellow** | **Gas, Oil, Steam, Petroleum Lines or Gaseous Materials** |
| **Orange** | **Conduit, Cable, Communication, Alarm or Signal Lines** |
| **Blue** | **Potable Water** |
| **Green** | **Sewer, Storm Sewer and Drain Lines** |
| **Purple** | **Reclaimed Water, Irrigation and Slurry Lines (non-potable)** |

Canadian Association of Geophysical Contractors




4.9 Identification and Mapping of Utility and Subsurface Structures

4.9.1 The locations of subsurface utilities and subsurface installations shall be investigated, documented, and shown on a site plan (a scaled site plan shall be used when feasible). Refer to *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist.*

4.9.2 Documentation of utility and subsurface installation identification (calling one call, responses from utilities) along with the scaled site plan shall be available on the worksite at all times of intrusive activities.

4.10 Site Walk

4.10.1 A site walk shall be conducted by the AECOM Manager and any other appropriate personnel with the objectives of reviewing all planned intrusive activity locations, the locations of subsurface and overhead utilities, overhead obstructions, and the potential for subsurface installations, to determine the appropriate utility clearance activities, and to observe other physical hazards.

- Walk the area at least 50 feet (15.2 meters) from perimeter of the site to observe physical hazards.
- Walk the area of at least 50 feet (15.2 meters) radius from each proposed subsurface intrusion location.
- If possible, particularly at urban and industrial sites, the client/property owner or an individual knowledgeable about the site and site utilities will attend the site walk.
- Add discovered items/issues to map for use in location confirmation.

4.10.2 The Site Walk further supplements the Identification and Mapping of Utility and Subsurface Structures procedure. Site Walks should be repeated as necessary following the Identification and Mapping of Utility and Subsurface Structures as visual verification of the hazards. Examples include:

- Proposed location(s) does not lie on a line connecting two similar manhole covers (e.g. sanitary sewer or storm drain).
- Proposed subsurface location(s) has not subsided, been excavated and patched, nor gives the appearance it may be covering a former trench (e.g. linear cracks, sagging curbs, linear re-pavements, etc.).
- Proposed subsurface location(s) does not lie on a line with any water, gas, electrical meters, utility cleanouts, or other utility boxes in the surrounding areas.

4.11 Proposed Subsurface Investigation Locations

4.11.1 All proposed subsurface locations will be reviewed in comparison to subsurface and overhead utilities and subsurface installations and adjustments made as necessary.

4.11.2 Minimum set back distances from subsurface and overhead utilities and subsurface installations will be established including 5 feet (1.5 meters) from any subsurface utility, 7 feet (2.1 meters) from the pad surrounding any underground storage tanks, and 10 feet (3 meters) from any overhead energized electrical line (or further depending on line voltage). These set back distances are a minimum; government regulations and utility requirements may dictate a greater set back distance.

4.12 Utility Clearance Investigation Location Confirmation

4.12.1 As applicable, all client on-site safety procedures shall be understood and adhered to.

4.12.2 Hand exposure or non-destructive ground disturbance techniques to expose an underground utility or subsurface installation are necessary to accurately determine size, location and alignment prior to mechanical excavation or intrusive subsurface work in the vicinity of that utility or installation.

4.12.3 Non-destructive ground disturbance techniques shall be acceptable to the owner of the buried utility (i.e. hydro-vacuum temperature or pressure).

4.12.4 Hydro-vacuum or air-knife require proper grounding equipment at sites where the subsurface may contain flammable gases, liquids, or vapors

4.12.5 Jurisdictional, land owner, client and utility owner requirements shall be consulted to determine the distance of the hand exposure zone, and what requirements, when met, may allow mechanical excavation within these zones.

4.12.6 At a minimum, all underground utilities and subsurface installations within a 5 feet (1.5 meter) radius of the work site shall be identified and physically located (seen) before use of mechanical excavation equipment is permitted. Jurisdictional, client, land owner and utility owner requirements shall be consulted as the required hand exposure radius may be larger.

4.12.7 In urban areas, proposed subsurface locations will be cleared by hand / non-destructive technique to 5 feet (1.5 meters) (soil borings and wells) or 12 inches (30 centimeters) (soil gas sampling probes) using non-mechanical methods.

- In non-urban areas, clearing by hand / non-destructive technique should be conducted if possible and shall be conducted as required by the given jurisdiction.
- Hand / non-destructive technique clearance should be extended if locations of deep utilities and structures are not known.
- Hand exposure or non-destructive ground disturbance techniques should extend a minimum of 24 inches (60 centimeters) below the intended ground disturbance depth to minimize the hazard of mechanical equipment contact with any utility or installation.

4.12.8 Mechanical equipment and attachment dimensions shall be considered when establishing the zone in which all underground utilities and subsurface installations are physically located (seen) prior to the use of that equipment. The radius may require expanding to maintain safe distances when using large equipment.

4.13 Utility Strikes

4.13.1 Utility strikes shall be reported in accordance with *S3AM-004-PR1 Incident Reporting, Notifications & Investigation*.

4.13.2 All damaged utilities shall be repaired by a qualified and/or licensed professional.

## 5.0 Records

5.1 Retain completed *S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist* and documents related the clearance process (e.g. Utility Owner communication, etc.) in the site or project files.

5.2 Documentation of employee training completed shall be retained in accordance with *S3AM-003-PR1 SH&E Training*.

## 6.0 Attachments

6.1 S3AM-331-ATT1 One-Call System

6.2 S3AM-331-ATT2 Underground Utilities & Subsurface Installation Flow Chart

6.3 S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist

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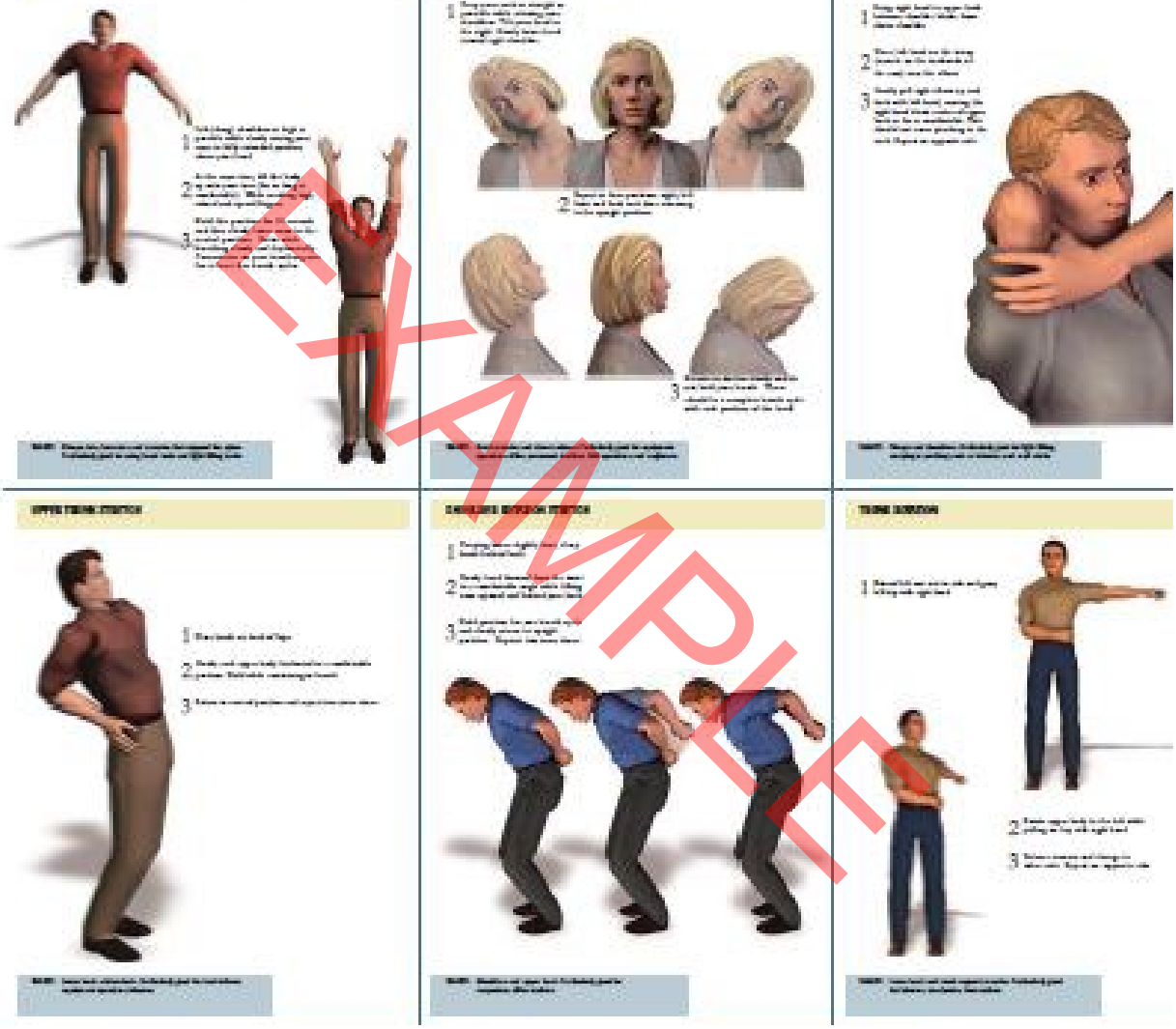
# ATTACHMENT D

## Stretch and Flex Poster

AECOM

Stretch & Flex Program



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# ATTACHMENT E

## Site Orientation

# E-1: SITE ORIENTATION INSTRUCTIONS AND CHECKLIST

AECOM will conduct a site safety briefing for a person's initial visit to the site. The briefing will be conducted:

- Prior to the start of work;
- For any new AECOM or subconsultant personnel; and
- At each mobilization, or whenever there is a change in task or significant change in task location.

All personnel working on the project who have received the site briefing (including the HASP review) will sign the Personal Acknowledgement located at the end of the HASP. Visitors may receive a shortened version to address the hazards specific to their visit.

The following items, at minimum, will be discussed during the site safety briefing:

- Contents of this HASP;
- The Emergency Response Plan;
- Contractor SH&E Management expectations;
- Injury management, including notification and hospital and occupational clinic locations;
- The AECOM 4-Sight program;
- Stop Work authority;
- The THAs (**Attachment B**) for the tasks that will be performed on a given project;
- Types of hazards at the site and means for minimizing exposure to them;
- Instructions for new operations to be conducted, and safe work practices;
- PPE that must be used;
- Lone worker check-in procedures;
- Emergency evacuation routes, muster points, and tornado/storm shelters; and
- Location and use of emergency equipment.

These meetings must be documented and maintained in the project files.

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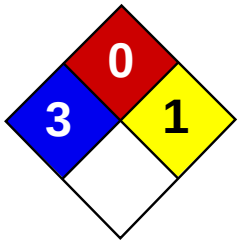
# ATTACHMENT F

## Safety Data Sheets



# Material Safety Data Sheet
## Hydrochloric acid MSDS



## Section 1: Chemical Product and Company Identification

**Product Name:** Hydrochloric acid

**Catalog Codes:** SLH1462, SLH3154

**CAS#:** Mixture.

**RTECS:** MW4025000

**TSCA:** TSCA 8(b) inventory: Hydrochloric acid

**CI#:** Not applicable.

**Synonym:** Hydrochloric Acid; Muriatic Acid

**Chemical Name:** Not applicable.

**Chemical Formula:** Not applicable.

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Hydrogen chloride | 7647-01-0 | 20-38 |
| Water | 7732-18-5 | 62-80 |

**Toxicological Data on Ingredients:** Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Serious Ingestion:** Not available.



## Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** of metals

**Explosion Hazards in Presence of Various Substances:** Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:**
Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

**Special Remarks on Explosion Hazards:**

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

## Section 6: Accidental Release Measures

**Small Spill:**
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

**Large Spill:**
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.



## Section 7: Handling and Storage

**Precautions:**
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Pungent. Irritating (Strong.)

**Taste:** Not available.

**Molecular Weight:** Not applicable.

**Color:** Colorless to light yellow.

**pH (1% soln/water):** Acidic.

**Boiling Point:**
108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

**Melting Point:**
-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

**Critical Temperature:** Not available.

**Specific Gravity:**
1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

**Vapor Pressure:** 16 kPa (@ 20°C) average

**Vapor Density:** 1.267 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.25 to 10 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:** Soluble in cold water, hot water, diethyl ether.



## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, water

**Incompatibility with various substances:**
Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

**Corrosivity:**
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**
Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

**Special Remarks on Corrosivity:**

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

**Toxicity to Animals:**
Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

**Other Toxic Effects on Humans:**
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

**Special Remarks on Toxicity to Animals:**
Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

**Special Remarks on Chronic Effects on Humans:**
May cause adverse reproductive effects (fetoxicity). May affect genetic material.

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure,  occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also



## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Hydrochloric acid, solution UNNA: 1789 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

**Other Regulations:**
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**
R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**HMIS (U.S.A.):**

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 1

**Personal Protection:**

**National Fire Protection Association (U.S.A.):**

**Health:** 3

**Flammability:** 0

**Reactivity:** 1

**Specific hazard:**

**Protective Equipment:**
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

## Section 16: Other Information

**References:**
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:45 PM

**Last Updated:** 05/21/2013 12:00 PM

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## Appendix 1A
## New York State Department of Health
## Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

**Continuous monitoring** will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

**Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/$m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/$m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/$m^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/$m^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

## Appendix 1B
## Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50$^{o}$ C (14 to 122$^{o}$ F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

• If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

• If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

• Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Special Requirements for Indoor Work With Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under “Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a m

# APPENDIX F – QUALITY ASSURANCE PROJECT PLAN

AECOM Imagine it. Delivered.

# Quality Assurance Project Plan

Penn Yan Former MGP
Penn Yan, NY
NYSDEC Site #8-62-009

June 2020

Prepared for:

New York State Electric and Gas Corp
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Prepared by:

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# Table of Contents



# Tables

# 1. Introduction

This Quality Assurance Project Plan (QAPP) provides a description of the sampling and laboratory procedures/protocols to be used in support of Site Management activities associated with the Penn Yan Water Street former manufactured gas plant (MGP) site located in the Village of Penn Yan, Town of Milo, Yates County, New York. The fundamental purpose of the QAPP is to ensure that quality analytical data will be generated to support the project in a manner consistent with the Data Quality Objectives as specified herein. This QAPP is designed to be used in conjunction with a New York State Department of Environmental Conservation (NYSDEC) approved Site Management Plan (SMP) with regards to specific project objectives and field sampling activities. To the extent that discrepancies exist between this QAPP and the SMP, the SMP shall take precedence.

# 2. Data Quality Objectives

Data quality objectives are statements, expressed in either qualitative or quantitative terms, which address the appropriate level of data quality for a project. The quality of data generated must be suitable to support the decisions used to achieve the overall goals as delineated in the SMP. The general project data quality objectives are summarized in this section, with detailed information given throughout this QAPP and associated sections of the SMP. The overall data quality objectives of the project are:

- To ensure that samples collected are representative of the sample population.
- To provide detection limits for the selected analytical methods, which are below the established cleanup objectives or regulatory limits.
- To measure and document precision and accuracy using procedures established by the laboratories, the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) and U.S. Environmental Protection Agency (EPA) approved analytical methods.
- To ensure that a NYSDOH ELAP and NYSDOH ELAP CLP certified laboratory will conduct all soil and water analyses.

# 3. Sample Collection

## 3.1 Soils

No soil samples will be collected as part of the SMP. If a soil removal action will be required where potentially impacted soils remain at the site, a soil sampling plan will be included with the soil removal work plan submitted to the NYSDEC for approval prior to any soil removal activities.

## 3.2 Groundwater Sampling

Groundwater samples will be collected as described in the appropriate sections of the SMP. These sections describe the collection procedures, sampling equipment, locations and frequencies for the groundwater samples.

Samples will be transferred directly into pre-cleaned sample collection containers, which are supplied by the laboratory performing the analyses. All necessary preservatives will be added to the sample containers at the laboratory prior to being shipped to the site (see Section 3.3). Samples will be stored at 4° Celsius until delivered to, and analyzed by, the laboratory.

## 3.3 Sample Containers and Preservatives

Sample containers and preservatives will be provided by the contracted laboratories and stored on-site in a clean and dry location. Sample containers and preservatives by matrix and analysis are listed in Table 1.

**Table 1: Sample Containers & Preservatives**

| *Analysis* | Matrix | Container | Preservative |
|---|---|---|---|
| Semivolatiles | Water | 1000 ml amber glass | 4º Celsius |
| Volatiles | Water | 40 ml glass | 4º Celsius or HCl to pH < 2 |
| Total Cyanide | Water | 500 ml Plastic | 4º Celsius NaOH to pH > 12 |
| Note: All glass containers will be sealed with Teflon liner caps. All water samples for organic fractions will be collected in duplicate. | | | |

## 3.4 Sampling Holding Times

Table 2 identifies samples holding times.

**Table 2: Groundwater Samples**

| Sample Type | Matrix | Holding Time |
|---|---|---|
| Semivolatiles | Water | 5 days to extraction<br>40 days after extraction |
| Volatiles | Water | 14 days |

| | | |
|---|---|---|
| Total Cyanide | Water | 14 days |

# 4. Sample Custody, Identification, and Tracking

## 4.1 Holding Times and Sample Transport

Since the samples will be analyzed at standard turn around, no exceedance of holding time is expected. Holding times will be calculated from the time the sample is collected to the subsequent extraction, if necessary, or analysis. All samples will be delivered to the laboratory by same day courier or overnight delivery in sealed coolers with ice.

## 4.2 Chain-of-Custody

A Chain-of-Custody will accompany all samples from the point of sampling to delivery of the samples to the laboratory. The COC will be a record of the location where the sample was collected, the data and time collected, number of containers collected, type(s) of analyses requested, special remarks or requests, and the signature of each custodian of the samples. The complete COC will be included in all hard copies of reports.

Upon sample receipt, laboratory personnel will be responsible for sample custody. The laboratory sample custodian will verify sample integrity and compare the cooler contents against the field COC. If a sample container is broken or leaking, it will be noted on the COC and NYSEG project personnel will be immediately notified. If the sample custodian observes any labeling or descriptive errors, NYSEG project personnel will be contacted immediately to resolve any discrepancies. After all discrepancies (if any) are resolved, the laboratory will acknowledge receipt of the samples (i.e., by signing and dating the COC and the completed COC will be included in all hard copies of reports and become a permanent part of the project records.

### 4.2.1 Sample Identification

Each sample collected during the project will have a unique identification number. This number, date of collection and type of analysis will be placed on each sample container after the sample is collected. See Appendix A for sample identification naming convention for air, water, and confirmatory samples.

## 4.3 Laboratory Sample Tracking

Each laboratory has an internal tracking mechanism to ensure that each sample received has a unique identification number and that results generated and reported for each sample correspond to the identification number assigned at the laboratory.

# 5. Calibration Procedures

Each analysis will be performed in accordance with NYSDOH ELAP (Environmental Laboratory Approval Program) sanctioned methods or equivalent U.S. EPA analytical procedures. Each procedure specifies the method of frequency of calibration necessary to perform accurate and precise analyses. Each analytical instrument verifies the Method Detection Limit at least every six months as prescribed by the NYSDOH ELAP. The calibration of the instruments is verified at the beginning and end of each auto sampler run. Gas Chromatograph/Mass Spectrometers are tuned and calibrated every 12 hours, at a minimum.

All field equipment, for real time air analyses will be calibrated daily, in accordance with manufacturer's recommendations. All equipment will be calibrated more frequently if conditions warrant. The total organic analyzer equipped with a photo ionization detector (PID) used to measure volatile organic vapors will be calibrated to benzene with a 100-ppm isobutylene air standard. The DataRam™ or a Thermo Andersen ADR-1200s used to measure particulates will be calibrated to zero with filtered air sample.

# 6. Analytical Procedures

## 6.1 Laboratory Analyses

The following Table shows the analytical method to be used for each analyte or group of analytes for the Project:

**Table 3: Analytical Methods**

| Analyte | Analytical Method |
|---|---|
| Total Semivolatiles | SW 846 Method 8270 |
| Total Volatiles | SW 846 Method 8260 |
| Total Cyanide | SW 846 9012 |

## 6.2 Laboratory Selection

The laboratory chosen for the project must be certified, and maintain certification, under the NYSDOH ELAP and NYSDOH ELAP CLP for analyses of solid and hazardous waste. Only analytical laboratories that have experience in MGP projects or similar projects will be considered for use. NYSEG has contracted with (To Be Determined) to perform laboratory services for Site Management.

# 7. Data Reduction, Validation and Reporting

## 7.1 Data Reduction

### 7.1.1 Field Data Collection

Real time field data collected during sampling events will include qualitative information regarding the texture, appearance, odors, and any other observations made while water samples are being collected. Meteorological data and current site activity will be noted while collecting data for real time air monitoring. These observations will be recorded in the field logbook.

### 7.1.2 Laboratory Data Collection and Reduction

A significant portion of the analyses performed requires the use of automated laboratory instrumentation. Raw data collected from the instrument's detectors will be converted to standard units of mg/L for water. All raw data will be stored in electronic form and in laboratory notebooks, in case the analysis needs to be recreated. Raw data for all analyses will be archived for a minimum of four years.

## 7.2 Data Review

All analytical data will be verified for precision and accuracy utilizing the laboratory's in-house Quality Assurance/Quality Control programs. In addition, all data packages will be reviewed by NYSEG project personnel to ensure that all data deliverables have been properly provided.

## 7.3 Full Data Validation

The full third-party data validation process consists of a formal systematic review of analytical results and quality control documentation with regards to the parameters cited in Section 8.3. On the basis of this review, a third-party data validator will make judgments and express concerns on the quality and limitations of the specific data and the validity of the data package as a whole. The data validator prepares documentation of his or her review using the standard USEPA Inorganics Regional Assessment and Organics Regional Assessment forms to summarize deficiencies and general laboratory performance. These forms are accompanied by appropriate supplementary documentation, which identifies specific problems.

Since a full data validation would typically be used for the purposes of litigation, this level of review may surpass the scope of work necessary for the project. Therefore, any full data validation for analytical results of samples will be performed at NYSEG's discretion. Sampling data will be archived if it becomes necessary to perform a full data validation at a future date.

## 7.4 Data Usability Summary Report

A Data Usability Summary Report (DUSR) provides a thorough review and evaluation of analytical data without the formality of a full third-party data validation. A DUSR for the analytical results of samples will be generated in lieu of a full data validation to verify that the proper data deliverables and procedures have been rendered in accordance with the data quality objectives of the SMP.

## 7.5 Reporting

Final reports for analytical data will be reviewed and accepted by NYSEG prior to submission to the NYSDEC. Reports for analyses performed under the ELAP protocol will contain results sheets for the sample analyzed. These reports must include a minimum:

- NYSEG Sample ID number;
- Laboratory sample ID number;
- Sample collection date;
- Extraction or digestion date (if applicable);
- Date Analyzed;
- Analytical method;
- Analytical results (with units clearly identified);
- Results of laboratory blank and field blanks;
- Results of spikes, matrix spikes, and duplicates;
- Surrogate recoveries (if applicable);
- Complete Chain-of-Custody forms; and
- File log sheets (if available)

# 8. Quality Control Checks

## 8.1 Field Quality Control

### 8.1.1 Decontamination Procedures for Sampling

The following decontamination procedure will be followed for all non-disposal sampling equipment before being reused.

- Equipment will be washed thoroughly with a non-phosphate detergent.
- The equipment will then be rinsed with analyte-free water.

After decontamination, equipment will be carefully stored to avoid contamination between sampling events.

## 8.2 Laboratory Quality Control

Each laboratory is NYSDOH Certified for the analyses they will perform. Each analyst must complete a start-up proficiency procedure to demonstrate their capability to perform accurate and precise analyses on each type of instrument they operate. In addition, each laboratory must accurately analyze samples provided by NYSDOH on a semi-annual basis to maintain certification. The laboratories have internal quality control officers that review all methodologies and implement corrective action, including reanalyzing samples, which do not pass, established laboratory quality control criteria.

Laboratory quality control procedures are specified in the analytical methods. These specifications include the type of laboratory quality control check required, compounds, and concentrations to be used, and laboratory quality control acceptance criteria.

Laboratory quality control checks will include (where specified by method):

- Calibration Standards
- Methods Blanks
- Matrix Spike/Matrix Spike Duplicates
- Surrogate Spikes
- Internal Standards
- Laboratory Duplicates
- Calibration Check Standards
- Laboratory Control Samples

# 9. Preventative Maintenance

## 9.1 Field Instruments and Equipment

Equipment instruments, tools, gauges, and other items requiring preventative maintenance will be serviced in accordance with the manufacturer's specified recommendations or written procedures developed by the operators. All field equipment service will be conducted by qualified personnel. Prior to any field sampling, each piece of field equipment will be inspected to ensure that it is operational. If the equipment is not operational, it must be repaired prior to use. All equipment which required charging or batteries will be fully charged or have fresh batteries at the start of the project. An equipment repair/maintenance log will be kept for each field instrument. Any non-operational/non-repairable field equipment will be replaced.

## 9.2 Laboratory Instruments and Equipment

Each laboratory has an instrument/equipment maintenance program, which includes procedures for daily, weekly, monthly, or annual routine maintenance. In addition, maintenance is performed if the accuracy and/or precision of the instrument are in question.

### 9.2.1 Instrument Maintenance

Preventative maintenance of laboratory instruments will be conducted in accordance with the manufacturer's guidelines or written procedures developed by the operators. All instrument service will be performed by qualified personnel. To minimize potential downtime, the laboratory will maintain a sufficient supply of critical spare parts for its instruments and, where practical, maintain a service contract for rapid instrument repair. Wherever possible, the laboratory will retain backup instrumentation. An instrument repair/maintenance log will be maintained for each instrument.

### 9.2.2 Equipment Monitoring

On a daily basis, the operation of the laboratory equipment (e.g., balances, ovens, refrigerators, water purification systems) will be checked and documented. Any discrepancies will be immediately reported to the appropriate laboratory personnel for resolution.

# Appendix A Sample Identification

# Sample Identification

**Naming Convention for Soil and Water Samples**

SYSTEM CODING

| | | |
|---|---|---|
| First & Second = Site | Penn Yan Water Street | PW |
| Third & Fourth = Source | Excavation | EX |
| | Stockpile | SP |
| | Frac Tank | FT |
| | Poly Container | PC |
| | Metal Barrel | MB |
| | Roll Off Container | RO |
| | Waste Wrangler | WW |
| | Test Pit | TP |
| | Boring | BO |
| | Geoprobe | GP |
| | Monitoring Well | MW |
| Fifth & Sixth = Location | Sidewall Sample | SW |
| | Bottom Sample | BM |
| | Waste Soil | WS |
| | Wastewater | WW |
| | Surface water | SW |
| | Groundwater | GW |
| | Debris | DB |
| Seventh & Eighth = Relative Depth | Surface Soil | 00 |
| | Depth below Ground | 02 |
| | Non-Applicable | NA |
| Ninth, Tenth & Eleventh = | Sample Number | 005 |

EXAMPLE: Penn Yan Water Street; Groundwater from Monitoring Well MW-04; and sample number 220

SAMPLE IDENTIFICATION: PWMWGWNA220

| FORMER MANUFACTURED GAS PLANT SITE<br>OR<br>FORMER MANUFACTURED GAS PLANT SITE DISPOSAL AREA | |
|---|---|
| **Site** | **Code** |
| Albion Ingersoll Street | AI |
| Auburn Clark Street | AC |
| Auburn Green Street | AG |
| Auburn McMaster Street | AM |
| Binghamton Court Street | BC |
| Binghamton – Johnson City | BJ |
| Binghamton Washington Street | BW |
| Clyde Lock Street | CL |
| Corning Chestnut Street | CC |
| Cortland/Homer South Main Street | CH |
| Dansville Ossian Street | DO |
| Elmira Madison Avenue | EM |
| Elmira Water Street | EW |
| Geneva Border City | GB |
| Geneva Wadsworth Street | GW |
| Goshen West Main Street | GS |
| Granville North Street | GR |
| Ithaca Cayuga Inlet | II |
| Ithaca Court Street | IC |
| Ithaca First Street | IF |
| Lockport State Road | LS |
| Lockport Transit Street | LT |
| Lyons Water Street | LW |
| Mechanicville Central Avenue | MC |
| Mechanicville Coons Crossing | ME |
| Mechanicville Willow Glen MGP Disposal Site | MW |
| Newark Water Street | NW |
| Norwich Birdsall Street | NB |
| Oneonta James Georgeson Avenue (Gas Ave.) | OG |
| Owego East Main Street | OE |
| Palmyra Park Drive | PP |
| Penn Yan Jackson Street | PJ |
| **Penn Yan Water Street** | **PW** |
| Plattsburgh Bridge Street | PB |
| Plattsburgh Saranac Street | PS |
| Seneca Falls Fall Street | SF |
| Warsaw Court Street | WC |
| Waterloo East Main Street | WE |
| Waterloo Babbott Street | WB |

# APPENDIX G
# SITE MANAGEMENT FORMS

**Summary of Green Remediation Metrics for Site Management**

Site Name: _____ Site Code: _____
Address: _____ City: _____
State: _____ Zip Code: _____ County: _____

**Initial Report Period (Start Date of period covered by the Initial Report submittal)**
Start Date: _____

**Current Reporting Period**
Reporting Period From: _____ To: _____

**Contact Information**
Preparer's Name: _____ Phone No.: _____
Preparer's Affiliation: _____

**I. Energy Usage:** Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

| | **Current Reporting Period** | **Total to Date** |
|---|---|---|
| Fuel Type 1 (e.g. natural gas (cf)) | | |
| Fuel Type 2 (e.g. fuel oil, propane (gals)) | | |
| Electricity (kWh) | | |
| **Of that Electric usage, provide quantity:** | | |
| Derived from renewable sources (e.g. solar, wind) | | |
| **Other energy sources** (e.g. geothermal, solar thermal (Btu)) | | |

*Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.*

**II. Solid Waste Generation:** Quantify the management of solid waste generated on-site.

| | **Current Reporting Period (tons)** | **Total to Date (tons)** |
|---|---|---|
| **Total waste generated on-site** | | |
| OM&M generated waste | | |
| **Of that total amount, provide quantity:** | | |
| Transported off-site to landfills | | |
| Transported off-site to other disposal facilities | | |
| Transported off-site for recycling/reuse | | |
| Reused on-site | | |

*Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.*

**III. Transportation/Shipping:** Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

| | **Current Reporting Period (miles)** | **Total to Date (miles)** |
|---|---|---|
| Standby Engineer/Contractor | | |
| Laboratory Courier/Delivery Service | | |
| Waste Removal/Hauling | | |

*Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.*

**IV. Water Usage:** Quantify the volume of water used on-site from various sources.

| | **Current Reporting Period (gallons)** | **Total to Date (gallons)** |
|---|---|---|
| Total quantity of water used on-site | | |
| **Of that total amount, provide quantity:** | | |
| Public potable water supply usage | | |
| Surface water usage | | |
| On-site groundwater usage | | |
| Collected or diverted storm water usage | | |

*Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.*

**V. Land Use and Ecosystems:** Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

| | **Current Reporting Period (acres)** | **Total to Date (acres)** |
|---|---|---|
| Land disturbed | | |
| Land restored | | |

*Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.*

| **Description of green remediation programs reported above**<br>(Attach additional sheets if needed) |
|---|
| Energy Usage: |
| Waste Generation: |
| Transportation/Shipping: |
| Water usage: |
| Land Use and Ecosystems: |
| Other: |

| **CERTIFICATION BY CONTRACTOR** |
|---|
| I, _____ (**Name**) do hereby certify that I am _____ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application.<br><br>_____<br>**Date** **Contractor** |

# MONITORING WELL INSPECTION FORM

SITE:

COMPANY:

SITE NAME: _____

JOB#: _____

DATE: _____

TIME: _____

WELL ID: _____

INSPECTOR (PRINT): _____

## EXTERIOR INSPECTION CONDITION

PROTECTIVE CASING/ CURB BOX: _____

LOCK/HASP CONDITION: _____ LOCK KEY #: _____

HINGE/ LID: _____ GASKET/SEAL : _____

SECURITY BOLTS TYPE: _____

SECURITY BOLTS : _____ THREAD CONDITION: _____

WELL PAD: _____ BOLLARDS: _____

LABEL/ ID CONDITION: _____

MAINTENANCE PERFORMED (e.g., anti seize applied, re-tapping bolt holes, bolt replacement, gasket replacement, etc.)

## INTERIOR INSPECTION CONDITION

WELL CASING INTERIOR: _____

WELL RISER: _____

ANNULAR SPACE: _____

J PLUG: _____

WATER LEVEL: _____ DEPTH TO BOTTOM: _____

HARD/SOFT BOTTOM: _____

MAINTENANCE PERFORMED (e.g., removed water, removed bentonite, sorbed sheen, replaced J plug, etc.)

ADDITIONAL COMMENTS: _____

INSPECTOR (SIGNATURE): _____

PROJECT MANAGER APPROVAL: _____

SITE NAME: _____ SITE ID.: _____

INSPECTOR: _____

# MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: _____

WEll ID.: _____

| | YES | NO |
|---|---|---|
| WELL VISIBLE? (If not, provide directions below) ..... | | |

WELL COORDINATES? NYTM X_____ NYTM Y_____

PDOP Reading from Trimble Pathfinder:_____ Satelites:_____

GPS Method (circle) Trimble And/Or Magellan

| | YES | NO |
|---|---|---|
| WELL I.D. VISIBLE? ..... | | |
| WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)..... | | |

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: .....

| | YES | NO |
|---|---|---|
| SURFACE SEAL PRESENT? ..... | | |
| SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below) ..... | | |
| PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below) ..... | | |

HEADSPACE READING (ppm) AND INSTRUMENT USED..... _____

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) _____

PROTECTIVE CASING MATERIAL TYPE: ..... _____

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): ..... _____

| | YES | NO |
|---|---|---|
| LOCK PRESENT? ..... | | |
| LOCK FUNCTIONAL? ..... | | |
| DID YOU REPLACE THE LOCK? ..... | | |
| IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below) | | |
| WELL MEASURING POINT VISIBLE? ..... | | |

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): ..... _____

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): ..... _____

MEASURE WELL DIAMETER (Inches): ..... _____

WELL CASING MATERIAL: ..... _____

PHYSICAL CONDITION OF VISIBLE WELL CASING: ..... _____

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE ..... _____

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES..... _____

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

_____

_____

_____

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

_____

_____

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

_____

_____

_____

REMARKS:

_____

_____

Sketch

# Monitoring Well Purging/Sampling Form

Project Name and Number: _____

Monitoring Well Number: _____ Date: _____

Samplers: _____

Sample Number: _____ QA/QC Collected? _____

Purging / Sampling Method: _____

1. L = Total Well Depth: _____ feet
2. D = Riser Diameter (I.D.): _____ feet
3. W = Static Depth to Water (TOC): _____ feet
4. C = Column of Water in Casing: _____ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ _____ gal
6. D2 = Pump Setting Depth (ft): _____ feet
7. C2 = Column of water in Pump/Tubing (ft): _____ feet
8. Tubing Volume = C2(0.005737088) _____ gal

| D (inches) | D (feet) |
|---|---|
| 1-inch | 0.08 |
| 2-inch | 0.17 |
| 3-inch | 0.25 |
| 4-inch | 0.33 |
| 6-inch | 0.50 |

Conversion factors to determine V given C

| D (inches) | 1-inch | 2-inch | 3-inch | 4-inch | 6-inch |
|---|---|---|---|---|---|
| V (gal / ft) | 0.041 | 0.163 | 0.37 | 0.65 | 1.5 |

Water Quality Readings Collected Using _____

| **Parameter** | **Units** | **Readings** | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Time | 24 hr | | | | | | | |
| Water Level (0.33) | feet | | | | | | | |
| Volume Purged | gal | | | | | | | |
| Flow Rate | mL / min | | | | | | | |
| Turbidity (+/- 10%) | NTU | | | | | | | |
| Dissolved Oxygen (+/- 10%) | % | | | | | | | |
| Dissolved Oxygen (+/- 10%) | mg/L | | | | | | | |
| Eh / ORP (+/- 10) | MeV | | | | | | | |
| Specific Conductivity (+/- 3%) | $mS/cm^c$ | | | | | | | |
| Conductivity (+/- 3%) | mS/cm | | | | | | | |
| pH (+/- 0.1) | pH unit | | | | | | | |
| Temp (+/- 0.5) | C | | | | | | | |
| Color | Visual | | | | | | | |
| Odor | Olfactory | | | | | | | |

**Comments:**

* Three consecutive readings within range indicates stabilization of that parameter.

# LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

SITE:
COMPANY:

Project: _____ Site: _____ Well I.D.: _____

Date: _____ Sampling Personnel: _____ Company: _____

Purging/ Sampling Device: _____ Tubing Type: _____ Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: _____ Depth to Well Bottom: _____ Well Diameter: _____ Screen Length: _____

Casing Type: _____ Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: _____ Sample Time: _____ QA/QC: _____

Sample Parameters: _____

## PURGE PARAMETERS

| TIME | pH | TEMP ($^0$C) | COND. (mS/cm) | DISS. $O_2$ (mg/l) | TURB. (NTU) | Eh (mV) | FLOW RATE (ml/min.) | DEPTH TO WATER (btor) |
|---|---|---|---|---|---|---|---|---|
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| **Tolerance:** | **0.1** | **---** | **3%** | **10%** | **10%** | **+ or - 10** | **---** | |

**Information:** WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{yl} = \pi r^2 h$)

**Remarks:**

# Site-Wide Inspection Form

**NYSEG Penn Yan Former Manufactured Gas Plant Site (NYSDEC Site #862009)**
**Penn Yan, New York**

Engineering Control (s):_____ Inspection Date:_____

| Item | Yes | No | N/A | Comments |
|---|---|---|---|---|
| Does the Engineering Control continue to perform as designed? | | | | |
| Does the Engineering Control continue to protect human health and the environment? | | | | |
| Does the Engineering Control comply with requirements established in the SMP? | | | | |
| Has remedial performance criteria been achieved or maintained? | | | | |
| Has sampling and analysis of appropriate media been performed during the monitoring event? | | | | |
| Have there been any modifications made to the remedial or monitoring system? | | | | |
| Does the remedial or monitoring system need to be changed or altered at this time? | | | | |
| Has there been any intrusive activity, excavation, or construction occurred at the site? | | | | |
| Were the activities mentioned above, performed in accordance with the SMP? | | | | |
| Was there a change in the use of the site or were there new structures constructed on the site? | | | | |
| In case a new occupied structure is constructed or the use of the current building changed, was a vapor intrusion evaluation done? | | | | |
| Were new mitigation systems installed based on monitoring results? | | | | |
| Were the groundwater wells in the monitoring network inspected during this site inspection? If so, were the Monitoring Well Field Inspection Logs Completed? | | | | |

Note: Upon completion of the form any non-conforming items warranting corrective action should be identified here within.

Name of Inspector: _____ Signature of Inspector: _____
Inspector's Company: _____ Date: _____

**IMMEDIATELY REPORT ANY FAILURE OR DEFECT TO THE PROJECT MANAGER SO A COUNTERMEASURE PLAN CAN BE IMPLEMENTED.**

AECOM

**Americas**

# Task Hazard Assessment

**S3AM-209-FM6**

| | |
|---|---|
| **Date:** | **Project Name / Location:** |
| **Permit / Job Number:** | **Project Number:** |
| **Description of Task:** | |

**Do you have a pre-job hazard assessment (JHA) specific to this task in your hands?**

- ○ **Yes** – review the steps, hazards, and precautions. Attach and reference JHA in the form below. Add any additional steps, hazards, and precautions to this form otherwise unidentified on JHA.
- ○ **No** – list all steps, hazards, and precautions associated with the task in the form below.

| **Basic Task Steps** (explain in order how the task will be carried out) | **Hazards** (identify all hazards & potential hazards of each step) | **Risk** (before) | **Control Measures / Precautions** (describe how that hazard will be controlled) | **Risk** (after) | **Revised?** (yes – record time) |
|---|---|---|---|---|---|
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| | | | **Highest Risk Index** | | |

The Task Hazard Assessment is to be completed at the worksite by the individual(s) who is intended to conduct the task immediately prior to initiating the associated task. Number and attach additional pages if necessary.

Worker/Visitor acknowledgement and review of this content on back of this document. Originator to also sign Worker acknowledgement section.

**Originator** _____ (Print Name) _____ (Signature)

**Supervisor** _____ (Print Name) _____ (Signature)

**Risk Matrix on Reverse**

**THIS FORM IS TO BE KEPT ON JOB SITE.**

AECOM

## WORKER SIGN ON

NAME (Please Print) TIME SIGNATURE

**I participated in the development and understand the content of this Task Hazard Assessment.**

## Task Hazard Assessment Follow-Up/Review

| Initials/Time | Initials/Time | Initials/Time |
|---|---|---|
| | | |
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**Instructions:**
Identify basic steps of the task and associated hazards. Calculate the initial risk rating. Identify control measure to eliminate or reduce the hazard's risk and calculate the residual risk rating. If the risk rating (after controls are implemented) cannot be reduced to 4 or lower, additional approvals are needed before the activity can begin.

Employees shall monitor the activities for compliance with this document. Workers should **STOP WORK** on a task if conditions change from the planned and agreed approach to the work.

This document should be updated to reflect new conditions or changes in task methods.

## VISITOR SIGN ON

**I have read and understand the content of this Task Hazard Assessment.**

| | | |
|---|---|---|
| | | |
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**Emergency Meeting / Assembly Area**

**Emergency Contact #**

**Method of Communication**

## Risk Rating Matrix

| Probability | Severity | | | | |
|---|---|---|---|---|---|
| | 5 - Catastrophic | 4 – Critical | 3 – Major | 2 – Moderate | 1 - Minor |
| 5 – Frequent | 25 | 20 | 15 | 10 | 5 |
| 4 – Probable | 20 | 16 | 12 | 8 | 4 |
| 3 – Occasional | 15 | 12 | 9 | 6 | 3 |
| 2 – Remote | 10 | 8 | 6 | 4 | 2 |
| 1 - Improbable | 5 | 4 | 3 | 2 | 1 |

| Risk Rating (Probability x Severity) | Risk Acceptance Authority |
|---|---|
| 1 to 4 (Low) | Risk is tolerable, manage at local level |
| 5 to 9 (Medium) | Risk requires approval by Operations Lead/Supervisor & SH&E Manager |
| 10 to 25 (High) | Risk requires the approval of the Operations Manager & SH&E Director |

| Severity – Potential Consequences | | | | |
|---|---|---|---|---|
| | People | Property Damage | Environmental Impact | Public Image/Reputation |
| Catastrophic | Fatality, Multiple Major Incidents | >$1M USD, Structural collapse | Offsite impact requiring remediation | Government intervention |
| Critical | Permanent impairment, Long term injury/illness | >$250K to $1M USD | Onsite impact requiring remediation | Media intervention |
| Major | Lost/Restricted Work | > $10K to $250K USD | Release at/above reportable limit | Owner intervention |
| Moderate | Medical Treatment | > $1K to $10K USD | Release below reportable limit | Community or local attention |
| Minor | First Aid | </=$1K USD | Small chemical release contained onsite | Individual complaint |

| Probability | | |
|---|---|---|
| Frequent | Expected to occur during task/activity | 9/10 |
| Probable | Likely to occur during task/activity | 1/10 |
| Occasional | May occur during the task/activity | 1/100 |
| Remote | Unlikely to occur during task/activity | 1/1,000 |
| Improbable | Highly unlikely to occur, but possible during task/activity | 1/10,000 |

# CHAIN OF CUSTODY RECORD

PROJECT NO. | SITE NAME

SAMPLERS (PRINT/SIGNATURE)

DELIVERY SERVICE:_____ AIRBILL NO.:_____

LAB_____

COOLER_____ of _____

PAGE_____ of _____

| LOCATION IDENTIFIER | DATE | TIME | COMP/ GRAB | SAMPLE ID | MATRIX | TOTAL NO.# OF CONTAINERS | TESTS / BOTTLE TYPE AND PRESERVATIVE | REMARKS | SAMPLE TYPE | BEGINNING DEPTH (IN FEET) | ENDING DEPTH (IN FEET) | FIELD LOT NO.# (IRPIMS ONLY) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
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**MATRIX CODES**

AA - AMBIENT AIR; SE - SEDIMENT; SH - HAZARDOUS SOLID WASTE; SL - SLUDGE; WP - DRINKING WATER; WW - WASTE WATER; WG - GROUND WATER; SO - SOIL; DC - DRILL CUTTINGS; WL - LEACHATE; GS - SOIL GAS; WC - DRILLING WATER; WO - OCEAN WATER; WS - SURFACE WATER; WQ - WATER FIELD QC; LH - HAZARDOUS LIQUID WASTE; LF - FLOATING/FREE PRODUCT ON GW TABLE

**SAMPLE TYPE CODES**

TB# - TRIP BLANK; SD# - MATRIX SPIKE DUPLICATE; RB# - RINSE BLANK; FR# - FIELD REPLICATE; N# - NORMAL ENVIRONMENTAL SAMPLE; MS# - MATRIX SPIKE

(# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY (SIGNATURE) | DATE | TIME |
|---|---|---|---|---|---|
| | | | | | |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED FOR LAB BY (SIGNATURE) | DATE | TIME |
| | | | | | |

SPECIAL INSTRUCTIONS

*Distribution: Original accompanies shipment, copy to coordinator field files*

URSF-075C/1 OF 1/CofCR/GCM

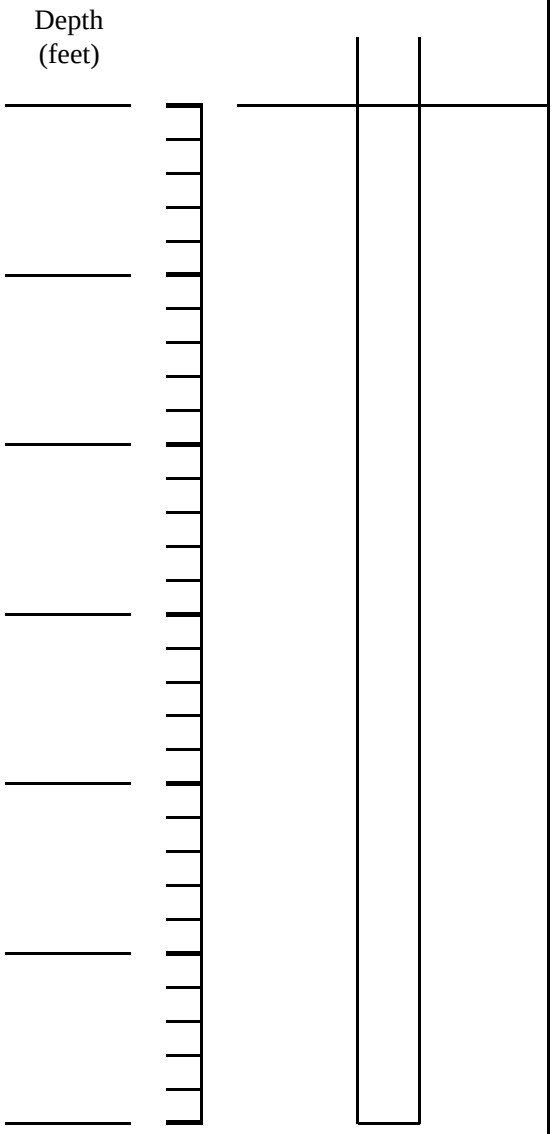
# WELL DECOMMISSIONING RECORD

| | |
|---|---|
| Site Name: Penn Yan Former MGP Site | Well I.D.: |
| Site Location: | Driller: |
| Drilling Co.: | Inspector: |
| | Date: |

DECOMMISSIONING DATA
(Fill in all that apply)

| | |
|---|---|
| **OVERDRILLING** | |
| Interval Drilled | |
| Drilling Method(s) | |
| Borehole Dia. (in.) | |
| Temporary Casing Installed? (y/n) | |
| Depth temporary casing installed | |
| Casing type/dia. (in.) | |
| Method of installing | |
| **CASING PULLING** | |
| Method employed | |
| Casing retrieved (feet) | |
| Casing type/dia. (in) | |
| **CASING PERFORATING** | |
| Equipment used | |
| Number of perforations/foot | |
| Size of perforations | |
| Interval perforated | |
| **GROUTING** | |
| Interval grouted (FBLS) | |
| # of batches prepared | |
| For each batch record: | |
| Quantity of water used (gal.) | |
| Quantity of cement used (lbs.) | |
| Cement type | |
| Quantity of bentonite used (lbs.) | |
| Quantity of calcium chloride used (lbs.) | |
| Volume of grout prepared (gal.) | |
| Volume of grout used (gal.) | |

WELL SCHEMATIC*




COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

# WELL DEVELOPMENT LOG

PROJECT TITLE: _____ WELL NO.: _____

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

| | | | WELL ID. | VOL. (GAL/FT) |
|---|---|---|---|---|
| 1. TOTAL CASING AND SCREEN LENGTH (FT.) | = | | 1" | 0.04 |
| 2. WATER LEVEL BELOW TOP OF CASING (FT.) | = | | 2" | 0.17 |
| 3. NUMBER OF FEET STANDING WATER (#1 - #2) | = | 0.0 | 3" | 0.38 |
| 4. VOLUME OF WATER/FOOT OF CASING (GAL.) | = | 0.17 | 4" | 0.66 |
| 5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) | = | 0.0 | 5" | 1.04 |
| 6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___ ) | = | 0 | 6" | 1.50 |
| 7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) | = | | 8" | 2.60 |

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

| | ACCUMULATED VOLUME PURGED (GALLONS) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETERS | | | | | | | | | | | |
| pH | | | | | | | | | | | |
| SPEC. COND. (umhos) | | | | | | | | | | | |
| APPEARANCE | | | | | | | | | | | |
| TEMPERATURE (°C) | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS:

# APPENDIX H – FIELD SAMPLING PLAN

AECOM Imagine it. Delivered.

# Field Sampling Plan

Penn Yan Former MGP
Penn Yan, NY
NYSDEC Site #8-62-009

June 2020

## Prepared for:

New York State Electric and Gas Corp
18 Link Drive
P.O. Box 5224
Binghamton, NY 13902

## Prepared by:

AECOM
40 British American Boulevard
Latham, NY 12110
aecom.com

# Table of Contents

# 1. Introduction

This Field Sampling Plan (FSP) is designed to provide detailed step-by-step procedures for the field activities performed during the long-term monitoring program at the New York State Electric and Gas (NYSEG) Penn Yan Former Manufactured Gas Plant Site (Site) located in the Village of Penn Yan, Town of Milo, Yates County, New York. It will serve as the field procedures manual to be strictly followed by all project personnel. Adherence to these procedures will ensure the quality and defensibility of the field data collected. In addition to the field procedures outlined in this document, all personnel performing field activities must do so in compliance with: (1) the Quality Assurance/Quality Control (QA/QC) measures outlined in the Quality Assurance Project Plan; (QAPP, Appendix F in the Site Management Plan (SMP); (2) the appropriate Health and Safety guidelines found in the Health and Safety Plan (HASP, Appendix G in the SMP); and (3) the scope of work outlined in the SMP. Locations of the monitoring wells are provided in Figure 2 of the SMP. Prior to each monitoring event, a groundwater level measurement will be recorded at each sampled/monitored well. Frequency of water level measurements and water quality sampling are defined in the SMP.

# 2. Monitoring Well Abandonment and Re-Development Procedures

## 2.1 Monitoring Well Abandonment Procedures

Well abandoning will be performed in accordance with New York State Department of Environmental Conservation (NYSDEC) CP-43, using the following steps:

1) Each well will be tremie grouted from the bottom of the well to within five feet of the ground surface to ensure a continuous grout column. Grout slurry composition should be the following:

    a. 1.5 to 3.0 percent by weight - Bentonite (Quick Gel)

    b. 40 to 60 percent by weight - Cement (Portland Type I)

    c. 40 to 60 percent by weight - Water

2) The well casing will be removed at a depth of five feet below grade (if possible) and the outer protective casing "stick-up" and/or flush-mount curb box will be removed only after the well has been properly filled with grout.

3) The uppermost five feet of the borehole will be filled with approved/clean backfill or topsoil.

4) The surface of the borehole will be restored to the condition of the area surrounding the borehole (crushed stone, asphalt, etc.). If the surrounding surface is a concrete sidewalk flag that flag will be replaced.

5) The solid waste should be handled is accordance with Section 11.0 of this plan.

6) Document well construction details in the field notebook and transfer the data onto the Well Decommissioning Record form (SMP Appendix G).

Reference: NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy, November 3, 2009.

## 2.2 Monitoring Well Re-Development Procedures

Summary: On occasion (e.g., due to excessive silt accumulation), it may be necessary to re-develop a monitoring well. Each well will be re-developed by surging and pumping until the discharged water is sediment free based on visual observations and the indicator parameters (pH, temperature, and specific conductivity) have reached a steady state. Re-developing the monitoring well not only removes any sediment, but also may improve the hydraulic properties of the formation. The effectiveness of the re-development measures will be closely monitored in order to keep the volume of discharged water to the minimum necessary to obtain sediment-free samples. A portable turbidimeter will be used to monitor the effectiveness of the re-development. A turbidity reading of < 50 Nephelometric Turbidity Units (NTU) and steady state pH, temperature, and specific conductivity readings will be used as a guide for discontinuing well re-development. The well will be re-developed as described below. Re-development water will be containerized in 55-gallon drums for off-site disposal.

Procedure:

1) An appropriate well re-development method should be selected, depending on water level depth, well productivity, and sediment content of water. Well re-development options include surging while manual pumping and powered suction-lift or hydrolift pumping.

2) Equipment should be assembled, decontaminated (if necessary), and installed in the well. Care should be taken not to introduce contaminants to the equipment during installation.

3) Well re-development should proceed by repeated surging and removal of water from the well until the discharged water is relatively sediment-free. The effectiveness of the re-development should be monitored at regular intervals using a portable turbidity meter. The volume of water removed and turbidity, pH, temperature, and conductivity measurements will be recorded on a Well Development Log (SMP Appendix G).

4) Well re-development will be discontinued when the turbidity of the discharged water is below 50 NTU.

Reference: ASTM Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers D5092-90.

# 3. Groundwater Sampling Procedures

## 3.1 Water Level Monitoring Procedures

Summary: Determination of groundwater depths in monitoring wells is necessary to make potentiometric surface maps. Water levels in monitoring wells scheduled to be sampled during the field work will be measured using an electronic interface probe/water level indicator. During each monitoring event, water levels to be used to generate potentiometric groundwater surface contour maps will be collected from all sampled monitoring wells. Water level measurement procedures are presented below.

Procedure:

1) Clean the water level probe and the lower portion of cable following standard decontamination procedures and test water level meter to ensure that the batteries are charged.

2) Lower the probe slowly into the monitoring well until the solid audible alarm indicates water.

3) Read the depth to the nearest hundredth of a foot from the graduated cable using the V-notch on the riser pipe as a reference.

4) Repeat the measurement for confirmation and record the water level.

5) Lower the probe slowly to the bottom of the monitoring well. Record the bottom depth of the well.

6) Remove the probe from the well slowly, drying the cable and probe with a clean paper towel.

8) Replace the well cap.

9) Decontaminate the water level meter if additional measurements are to be taken.

## 3.2 Well Purging Procedures

Well purging will be completed using the low-flow purging technique as follows:

1) The well cover will be carefully removed to avoid having any foreign material enter the well.

2) Using an electronic interface probe, the water level below top of casing will be measured. The depth of the well will be measured to determine the volume of water in the well. The end of the probe will be decontaminated between wells. The depth to bottom of the well will be recorded from the V notch in the top of the casing.

3) Calibrate field instruments [e.g., pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), specific conductance, temperature, and turbidity].

4) Start the flow rate low and maintain it between 100 and 500 ml/min, optimally at a rate where the water level remains stable.

5) Purge the required water volume (i.e., until stabilization of pH, DO, ORP, temperature, specific conductivity, and turbidity) using a low-flow pump (e.g., peristaltic pump) and dedicated high density polyethylene (HDPE) tubing (or similar). During purging, it is permissible to by-pass the flow cell until the groundwater has cleared. New dedicated tubing will be used for each well.

6) Purge the well until the water quality parameters have stabilized. Collect groundwater parameters every five minutes until the well has stabilized. The respective measurements of the parameters must fall within the stated range for three consecutive readings. If stability or five well volumes has been achieved for the parameters listed below, the well can be sampled. The stabilization criteria are: DO ± 10% full-scale range; ORP ± 10%; specific conductivity ± 3% full-scale range; pH ± 0.10 pH unit; temperature ± 0.2°C, and turbidity ± 10% if greater than 50 nephelometric turbidity unit (NTU).

7) Purging of three well volumes is not necessary if the indicator parameters are stable. However, a minimum of thirty minutes of purging is required before sampling, even if the parameters are stable. At the start of purging, it is permissible to by-pass the flow cell until the groundwater has cleared.

Well purging data are to be recorded on the Low Flow Groundwater Purging/Sampling Log (SMP Appendix G).

## 3.3 Groundwater Sampling Procedures

The following groundwater sampling procedures will be used for monitoring wells after purging has been conducted:

Procedure:

1) After well purging is completed, the flow cell will be disconnected and drained and a sample will be collected into the appropriate laboratory supplied containers from the well tubing, without changing the purge rate.

2) Direct water flow toward the inside wall of the sample container to minimize volatilization. Fill volatile sample containers so no headspace (air bubbles) is present. If containers are pre-preserved, do not overfill sample containers. Note if effervescence is observed.

3) All sample bottles will be labeled in the field using a waterproof permanent marker. They will be filled in the order: volatile organic compounds (VOCs, benzene, toluene, ethylbenzene, and xylene (BTEX only)), semi-volatile organic compounds (SVOCs, polycyclic aromatic hydrocarbons (PAHs) only), and remaining parameters (e.g. cyanide, total suspended solids, etc.).

4) Samples will be collected into laboratory-provided sample bottles (containing required preservatives) and placed on ice in coolers for processing (preservation and packing) prior to shipment or delivery to the analytical laboratory. A chain-of-custody (COC) record (SMP Appendix G) will be initiated. The analytical laboratory will provide certified analyte-free sample bottles.

6) After the required sample containers have been filled, remove dedicated/disposable HDPE tubing (or similar). Decontaminate reusable sampling equipment with laboratory grade soap and distilled water and rinse with distilled water before reassembling.

7) Well sampling data are to be recorded in the field notebook and on the Well Purging Log (SMP Appendix G).

8) Groundwater samples will be placed on ice, and delivered to the laboratory either by the sampler, laboratory courier or common courier (e.g. FedEx) under COC control. The volume of sample required, bottle type and required QA/QC may be found in the QAPP. Groundwater samples will be collected for the parameters referenced in the QAPP. Samples must be received by the laboratory less than 24 hours after collection.

9) If samples are shipped via common courier, the sample cooler must be sealed with a custody seal.

Any observations of sheen, blebs, free-phase product, staining or coating of the sampling equipment, odor, etc. that were made during sampling of groundwater are to be included in the groundwater sample collection log (SMP Appendix G).

# 4. Sample Labeling

Summary: In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, the following procedures will be used:

Procedure: Each container will have the following information placed on the laboratory supplied sample label:

- Site name
- Sample identification
- Project number
- Collection date/time
- Sampler's initials
- Analysis required and preservatives

Refer to Appendix A of the QAPP (Appendix F) – Sample Identification.

Field duplicate samples will be assigned a unique identification alphanumeric code that specifies the data of collection, the letters DUP (for field duplicate) and an ascending number that records the number of duplicate samples collected that day. For example, the first field duplicate collected on November 17, 2020 would be assigned the following sample number using the code shown below:

DUP-MMDDYY = FD-111720

Subsequent duplicates collected on the same day would be assigned FD-111720-2, FD-111720-3, etc. The field duplicate IDs are “blind”, so that the laboratory cannot trace them to their parent samples. Field sampling crew will record the duplicate sample information on the appropriate Sampling Field Data Sheets and also in the field notebook. The sample will be added to the COC with the time of collection of 0000.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will use the same well identification name as the parent sample, with the acronym MS/MSD after it; for example, MS/MSD collected from well MW- 04 with sample number 220: PWMWGWNA220 (MS/MSD). The sample will be added to the COC with the same time of collection as the parent sample.

Rinsate (Equipment) Blank samples will be labeled with the letters RB (rinsate blank) and the date of collection in the same order as for the field duplicate and added to the COC (e.g., using the same date as above, RB-111720).

Trip blanks will be labeled with the letters TB (trip blank) and the date in the same order as the field duplicate and added to the COC (e.g., for example, using the same date as above, TB-111720).

# 5. Quality Assurance/Quality Control Sampling

QA/QC procedures are described in the QAPP. QA/QC samples will be collected as follows:

- Field duplicates will be collected per matrix at the rate of one per twenty (5%) samples collected. It will be collected immediately following the collection of the parent sample for the same parameters as the parent sample.
- Matrix Spike/ Matrix Spike Duplicate (MS/MSD) samples will be collected for each matrix at a rate of one per twenty (5%) samples collected. It will be collected immediately following the collection of the parent sample for the same parameters as the parent sample.
- Rinsate (Equipment) Blank samples will be collected one time per sampling event. Laboratory provided deionized water will be run through the clean reused equipment and collected for the same parameters as the sampling program. If dedicated, disposal sampling equipment is used, rinsate blanks are not required.
- Trip Blanks will be provided by the laboratory filled with analyte-free water and returned at the rate of one per sample pickup. Trip blanks will be analyzed for VOCs only.

# 6. Field Documentation

Field notebooks will be used during all on-site work. A dedicated permanently-bound field notebook will provide a legal record and will be maintained by the field technician overseeing the site activities. Entries will be written with waterproof ink and will be of sufficient detail that a complete daily record of significant events, observations, and measurements is developed. At the conclusion of each day of fieldwork, entries will be signed and dated. Erroneous entries will be corrected by the field technician that made the entries. Corrections will be made by drawing a single line through the error, entering the correct information, and initialing/dating the correction.

The field sampling team will maintain the daily field notebook and logs (SMP Appendix G), which will minimally include the following information:

1) Project name and location of field activity
2) Date and time of entry
3) Names and titles of field team members onsite
4) Names, titles of any site visitors, as well as date and time entering and leaving site
5) Weather information (e.g., temperature, precipitation, cloud coverage, wind speed and direction, etc.)
6) Purpose of field activity and detailed description of fieldwork conducted
7) Sample media to be collected
8) Sample Identification
9) Date and time of sample collection
10) Field observations and measurements (e.g., PID, water levels)
11) Sampling methods and devices
12) Purge volumes (e.g., groundwater)
13) Groundwater purge parameters e.g., pH, temperature, ORP, DO, conductivity, water levels, turbidity, etc.
14) Chain of custody and shipping information.

# 7. Sample Shipping

Summary: Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody (COC) procedures. COC procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. COC procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in this study follow the chain-of-custody guidelines outlined in NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure:

1) A COC record is initiated at the analytical laboratory performing the sample analyses and will accompany the sample containers during preparation, delivery of the sample containers to the field, and during return shipment to the laboratory.

2) The COC record (SMP Appendix G) should be completely filled out by field personnel with all applicable/relevant information as samples are collected and packed for shipment e.g., project name and number, field technician name, sample ID, date/time of collection, matrix, requested parameters, number of sample bottles, relinquishing/receipt signatures, method of sample shipment with shipper airbill number, name of analytical laboratory, etc. Any erroneous markings will be crossed-out with a single line and initialed by the author.

3) The original COC accompanies the samples. It should be placed in a Ziploc® bag (or equivalent) and placed inside the cooler containing the samples. The sampler should retain a copy of the COC for the project records.

4) All groundwater samples should be placed and stored on ice immediately after sample collection in the laboratory supplied coolers.

5) If the laboratory provides a courier to collect the samples from the site, samples should be picked up on the day of collection. If that is not possible, the samples shall be stored on ice in a secure area then delivered to the laboratory the next day, or as soon as possible.

6) If the courier is not provided, samples can be shipped via common courier. Pack the coolers with the samples wrapped in bubble wrap, place ice in plastic baggies to prevent any melt from leaking out of the cooler, and make sure samples will not shift in the cooler. Place the lab address on top of sample cooler. Affix numbered custody seals across the cooler lid. Cover seals with wide, clear tape.

7) Ship samples via overnight carrier the same day that they are collected and must be delivered to the laboratory the following morning.

8) The COC seal must be applied in a manner where they must be broken in order to open the shipping container. Breakage of the seal before receipt at the laboratory may indicate tampering. If tampering is evident, the laboratory must immediately contact the laboratory Project Manager, whom further contacts the consultant Project Manager for further instructions (i.e., cancel or proceed with analyses).

# 8. Field Sampling Instrumentation

Field sampling equipment will require no maintenance beyond decontamination between sampling locations. Calibration procedures for electronic instruments can be found in the equipment operating manuals. Calibration and maintenance procedures for the common instrumentation that will be used during field investigations are discussed in the equipment operating manuals. A copy of the manufacturer's operating manual for each instrument will be kept with the instrument or the operator. All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions. The calibration procedures and results will be recorded in the field notebook. All changes to instrumentation will be noted in the field notebook.

The following field instruments may be used during project site work:

1) Multi-Parameter Meter (MultiRAE PLUS PGM-50 Monitor (10.6 eV lamp) with PID, %LEL) - Calibration of the meter and a battery check will be performed daily in accordance with manufacturer's specifications. Standards used for calibration will be National Institute of Standards and Technology (NIST) traceable. All calibration data will be recorded in the field notebook.

2) Turbidity Meter – The turbidity meter will be checked daily in accordance with manufacturer's specifications. All daily data will be recorded in the field notebook.

3) Horiba U-22 Multi-Parameter Meter – Calibration of the meter will be performed daily in accordance with manufacturer's specifications. All daily data will be recorded in the field notebook.

# 9. Sampling Equipment Decontamination Procedures

Summary: To assure that no outside contamination will be introduced into the samples/data, thereby invalidating the samples/data, the following cleaning protocols will apply for all equipment used to collect samples/data during the field investigations.

Procedures:

1) Thoroughly clean equipment with laboratory-grade soap and water, until all visible contamination is gone.
2) Rinse with water, until all visible evidence of soap is removed.
3) Rinse several times with deionized water.
4) Air dry before using.
5) If equipment will not be used immediately, wrap in aluminum foil.
6) Decontamination materials will be collected and placed in 55-gallon drums.

# 10. Investigation-Derived Waste Characterization and Disposal

Investigation derived waste (IDW) comprises decontamination water, purge water, and NAPL. IDW will be contained in 55-gallon drums. All personal protective equipment (PPE) or disposable sampling equipment (e.g., tubing) will be disposed of as standard municipal waste unless contaminated with visual product, in which case it will be drummed as IDW.

IDW will be properly characterized for off-site disposal.

The IDW subcontractor will be responsible for removing IDW from the work site as needed. All waste will be disposed of at a permitted off-site disposal facility.

# 11. Analysis

Each groundwater sample will be analyzed by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for those parameters referenced in the QAPP. Field personnel will coordinate with the laboratory for sample pick-up, delivery and/or shipment of the samples to the laboratory.

# APPENDIX I REMEDIAL SYSTEM OPTIMIZATION TABLE OF CONTENTS

REMEDIAL SYSTEM OPTIMIZATION FOR PENN YAN FORMER MGP

TABLE OF CONTENTS

# APPENDIX J

# REQUEST TO IMPORT/REUSE FILL MATERIAL FORM

**NEW YORK STATE**
**DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

***Request to Import/Reuse Fill or Soil***

*This form is based on the information required by DER-10, Section 5.4(e). Use of this form is not a substitute for reading the applicable Technical Guidance document.*

## SECTION 1 – SITE BACKGROUND

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

## SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that would pass a size 10 sieve? Choose an item

Does it contain less than 10%, by weight, material that would pass a size 100 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

## SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

---

*Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.*

*If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.*

## SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

---

*Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.*

*If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.*

## SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

_____

Firm

Revised August 2014