Park Street Former MGP Site
Livingston County
Village of Geneseo, New York

SITE MANAGEMENT PLAN

NYSDEC Site Number: V00731

Prepared for:
Rochester Gas & Electric
1300 Scottsville Road
Rochester, New York 14624

Prepared by:
Arcadis of New York, Inc.
295 Woodcliff Drive
Fairport, New York

Revisions to Final Approved Site Management Plan:

Revision #	Date Submitted	Summary of Revision	NYSDEC Approval Date

June 2018

CERTIFICATION STATEMENT

I, Jason Brien, P.E. certify that I am currently a New York State registered Professional Engineer to the best of my knowledge, and based on my inquiry of the persons involved in preparing this document under my direction, certify that this Site Management Plan was prepared in substantial conformance with applicable portions of the DER Technical Guidance for Site Investigation and Remediation (DER-10), and in general conformance with the Site Management Plan Template provided by the New York State Department of Environmental Conservation.

P.E.
New York State P.E. No. 084067

06/29/18 DATE

TABLE OF CONTENTS

Geneseo Park Street Former MGP Site
Livingston County
Village of Geneseo, New York

LIST OF TABLES

LIST OF TABLES IN TEXT

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

bgs	below ground surface
BDL	Below Detection Limits
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COPCs	constituents of potential concern
cy	cubic yards
CP	Commissioner Policy
DER-10	Department of Environmental Remediation Technical Guidance for Site Investigation and Remediation
DNAPL	Dense Non-Aqueous Phase Liquids
DO	Dissolved Oxygen
DUSR	Data Usability Summary Report
EC	Engineering Control
EC/IC Plan	Engineering and Institutional Control Plan
ECL	Environmental Conservation Law
EDD	Electronic Data Deliverable
ELAP	Environmental Laboratory Approval Program
EWP	Excavation Work Plan
ft.	feet
ft./day	feet per day
GFSP	Generic Field Sampling Plan
GHASP	Generic Health and Safety Plan
GQAPP	Generic Quality Assurance Project Plan
IC	Institutional Control
IRM	Interim Remedial Measure
K	hydraulic conductivity
mg/kg	milligrams per kilogram
MGP	Manufactured Gas Plant
MW	Monitoring Well
NAPL	Non-aqueous phase liquid

NRW	NAPL Recovery Well
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RG&E	Rochester Gas and Electric Company
SCGs	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SC Report	Site Characterization Report
SMP	Site Management Plan
SOP	Standard Operating Procedures
SVI	Soil Vapor Intrusion
SVOCs	Semi-volatile organic compounds
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
TOGS	NYSDEC Technical and Operational Guidance Series
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

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

Site Identification: Park Street Former MGP Site
4 and 6 Park Street
Village of Geneseo, New York
NYSDEC Site # V00731

Institutional Controls: 1. Imposition of a Declaration of Covenants and Restrictions (Deed Restriction) that will: • Restrict use of the property to Restricted Residential, Commercial and Industrial Uses, and voluntarily restricts the use of the property to non-residential use • Restrict the use of groundwater as a source of potable or process water without appropriate treatment as determined by the New York State Department of Health (NYSDOH) or Livingston County DOH • Require inspection of Engineering Controls at the frequency and as described in this SMP • Require periodic certification of institutional and engineering controls • Require compliance with this SMP
Engineering Controls: 1. Maintain the existing site covers
Site Inspections: 1. Annually, and after severe weather conditions
Monitoring and Sampling: 1. MW-5: Monitored quarterly and NAPL removal, as required, for initial period until less frequent monitoring is approved by the NYSDEC 2. MW-1, MW-2, MW-3, MW-4, MW-6, MW-7, MW-8: monitored and sampled semi-annually for initial 5-year period
Maintenance: 1. As required based on site inspections
Reporting: 1. Periodic Review Report – submitted annually to NYSDEC

Further descriptions of the above requirements are provided in detail in the following sections of this SMP.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Park Street Former Manufactured Gas Plant (MGP) site located in the Village of Geneseo, New York (hereinafter referred to as the "site"). See **Figure 1**, Site Location Map. The site is currently in the New York State (NYS) Voluntary Cleanup Program (VCP), Site No. V00731, which is administered by New York State Department of Environmental Conservation (NYSDEC).

Rochester Gas and Electric Corporation (RG&E) entered into an Amended and Restated Voluntary Cleanup Agreement (VCA) on December 23, 2014 (DEC Index No. B8-0535-98-07) with the NYSDEC to include this site. The agreement obligated RG&E to implement a remedial program for hazardous substances that are components of wastes associated with MGP-related operations at the site. A figure showing the site location and boundaries of the site is provided on **Figure 2**. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Deed Restriction provided in **Appendix A**.

After completion of a source material removal interim remedial measure (IRM) under NYSDEC guidance in 2003, some MGP-related residuals were left at the site, which is hereafter referred to as "remaining MGP contamination". Imposition of an Institutional Control (IC) in the form of Deed Restriction has been incorporated into the site remedy to control exposure to remaining MGP contamination to ensure protection of public health and the environment. A Deed Restriction granted by the State University of New York to the NYSDEC, and recorded with the Livingston County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site. A copy of the recorded Deed Restriction is included as **Appendix A**.

This SMP was prepared to manage remaining MGP contamination at the site until the Deed Restriction is extinguished in accordance with its terms. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Deed Restriction 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 Deed Restriction. Failure to properly implement the SMP is a violation of the Deed Restriction, which is grounds for revocation of the Release and Covenant Not to Sue issued pursuant to 6 NYCRR 375-1.9 and/or the Release and Covenant Not to Sue conferred by the NYSDEC pursuant to Subparagraph II.H of the VCA; and
- Failure to comply with this SMP is also a breach of Environmental Conservation Law, 6NYCRR Part 375 and the VCA 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 regulatory contacts for persons involved with the site is provided in **Table 1-1** at the end of this section. Site contact information for the Responsible Party (RG&E) and the owner/operator of the site are provided in **Table 1-2**, also located at the end of this section.

This SMP was prepared by Arcadis of New York, Inc. (Arcadis), on behalf of RG&E, 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 Deed Restriction for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's Project Manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Deed Restriction for the site, the NYSDEC 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 RG&E and/or the State University of New York to the NYSDEC, as needed, in accordance with NYSDEC's DER–10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the Decision Document, 6NYCRR Part 375, and/or Environmental Conservation Law;

- 7-day advance notice of any field activity associated with the remedial program;
- 10-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (EWP);
- Notice within 48-hours of discovery of any damage or defect 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;
- 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;
- 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:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Decision Document, VCA and all approved work plans and reports, including this SMP;
- 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 1-1 below includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information.

Table 1-1: Regulatory Contacts and Notifications*

Name	Contact Information
NYSDEC Project Manager: Mr. Amen Omorogbe, P.E. 625 Broadway Albany, New York 12233	Telephone: 518.402.9662 Email: amen.omorogbe@dec.ny.gov
NYSDOH Project Manager: Mr. Anthony Perretta Bureau of Environmental Exposure Investigation New York State Department of Health Empire State Plaza–Corning Tower, Rm 1787 Albany, NY 12237	Telephone: 518.402.7860 Email: BEEI@health.ny.gov

* Regulatory contacts and notifications are subject to change and will be updated as necessary.

Table 1-2; Site Contacts*

Property Owner: New York State, SUNY at Geneseo	**Contact**: Mr. Chuck Reyes, CHMM, CHO SUNY at Geneseo 1 College Circle Geneseo, New York 14454 Telephone: 585.245.5512
Remedial/Responsible Party: Rochester Gas and Electric Company	**Contact**: Mr. Jeremy Wolf 1300 Scottsville Road Rochester, New York 14624 Telephone: 585.771.8548

* Site contacts are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The Park Street former MGP site is located at the 4 and 6 Park Street properties in the Village of Geneseo, Livingston County, New York. The Livingston County Tax Maps identifies the western portion of the site as Section 080.16, Block 1, Lot 33, and the eastern portion of the site as Section 080.16, Block 1, Lot 34. The site is an approximately ¾ -acre area and is surrounded by commercial buildings and School Street to the north, Park Street to the south, commercial buildings along the west side of Main Street to the east, and a State University of New York (SUNY) academic complex (the Brodie Fine Arts building) to the west (**Figure 2**, Site Map). The boundaries of the site are more fully described in **Appendix A,** Deed Restriction. The owner of the site parcels at the time of issuance of this SMP is the "People of the State of New York, acting by and through the Board of Trustees of the State University of New York" (SUNY).

2.2 Physical Setting

2.2.1 Land Use

The Park Street site consists of a parking lot (L-Lot), access road, and sidewalk for SUNY campus that straddles the boundary between the village commercial district and the SUNY campus. The former gas holder for the MGP is farther west under the Brodie Fine Arts building. Most of the area occupied by the former MGP is either paved or located under paved surfaces. A small landscaped area is located at the southern end of the site. Although SUNY has agreed to maintain the site's non-residential use, both the 6 Park Street and 4 Park Street portions of the site appear to be currently zoned for mixed use (MU-1).

The properties adjoining the site and in the neighborhood surrounding the site primarily include educational, commercial and residential properties. The properties immediately north, south, and east of the site are also designated as mixed use (MU-1) properties; the properties to the north and west of the site are part of the SUNY campus.

2.2.2 Geology

The general stratigraphic profile consists of fill underlain by till deposits which are underlain by weathered bedrock and competent bedrock. Drilling completed during implementation of

the *Site Characterization Work Plan* (Arcadis, 2015) indicated that the thickness of fill material at the site varies from less than 2 feet to 9 feet below ground surface (bgs) and is generally observed to be thicker near former MGP structures (**Figure 2**, SB-3 and SB-5). Beneath the fill is a medium to very dense till unit with varying amounts of clay and gravel encountered at depths from approximately 2 to 14.5 feet bgs. Bedrock at the site is shale with a weathered bedrock surface observed from approximately 8 to 18.5 feet bgs. The thickness of the weathered bedrock ranges from approximately 0.3 to 6 feet, depending on location. Generally, the upper 10 feet of bedrock was observed to be highly fractured with low rock-quality designation (RQDs) percentages (less than 50%). Bedrock below this depth exhibited RQDs generally above 85% and contained primarily horizontal jointing along bedding planes with few low angle joint sets (10-15 degrees) and few high angle joint sets (80 degrees to vertical). Some joints exhibited secondary mineralization or solution-widening.

Both the weathered and competent bedrock surfaces slope to the west-northwest at an approximate 5% slope. Depth and thickness ranges for stratigraphic units vary across the site and are a result of the grade elevation change across the site (difference in grade elevation from the eastern to western side of the site is approximately 18 feet) and as a result from the excavation IRM completed in 2003.

Site specific soil boring and monitoring well construction logs are provided in **Appendix B**.

2.2.3 Hydrogeology

The depth to the water table beneath most of the site is approximately 10 to 15 feet bgs; however, where the grade elevation is substantially lower in the western portion off the site (i.e., near MW-7) the depth to the water table is approximately 6 feet bgs. Water-level gauging data indicates that the water table lies slightly above the top of competent bedrock, within the weathered bedrock or lower portion of the overburden. Given the relatively low RQDs observed in the upper approximately 10 feet of competent bedrock and the presence of a highly fractured weathered bedrock zone, it is reasonable to assume the that majority of groundwater flow beneath the site is within the weathered bedrock and upper 10 feet of competent rock.

Gauging data collected during August and October 2015 gauging events indicate that groundwater flow is to the west-northwest, in the direction of the Genesee River, and generally consistent with the slope of the bedrock surface. Based on the contours shown on **Figure 3** and **Figure 4**, the horizontal hydraulic gradient across the site is estimated at approximately 0.05

ft./ft. It is reasonable to assume that the surface topography of the bedrock exerts some control on shallow groundwater flow. Groundwater elevation data is provided in **Table 1**. As mentioned above, groundwater monitoring well construction logs are provided in **Appendix B**.

Environmental Data Resources, Inc. (EDR) was contracted to perform a search of available state and federal environmental records for the surrounding area. No wells were found on the Local/Regional Water Agency Records; however, one public water supply well was identified ⅛ mile east-northeast (i.e., hydraulically upgradient) of the site and three wells were identified within ¼ to ½ mile northeast of the site on the State Database Well Information database.

2.3 Investigation and Remedial History

The Park Street MGP was built in 1860 and most likely produced gas by the coal carbonization process until January 1906. During this time the plant consisted of one building, which presumably housed the gas retorts, and one gas holder. The 1900 Sanborn map shows a small electric generating building northeast of the MGP, on School Street. The 1906 Sanborn notes a small lime house (lime was often used in gas purification), a paint shop on the north side of the gas house, and a coal shed to the northeast (it is possible that the coal house was associated with the electric generating building).

The 1913 Sanborn map shows that the gas house and gas holder were gone from the site. The electric generating building to the northeast of the site is identified as a hardware store on the 1930 through 1949 Sanborn maps, and this building remains today. A survey map dated 1973 identifies this building as a book store. The approximate locations of the historical MGP-related structures are shown on **Figure 2**. SUNY acquired the 4 and 6 Park Street properties in 2001. The property to the west of the site where the Bodine Fine Arts building exists was acquired first by SUNY; however, the date of the acquisition is unknown.

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

Remediation of MGP-related source materials was completed as an IRM by a contractor of SUNY under the oversight of NYSDEC during SUNY's Park Street entrance improvement program when the site was developed as a parking lot. In September 2002 during final preparation for paving of the parking lot, a stone/brick containment structure was discovered

approximately 4 feet bgs that contained a black tarry material. The structure appears to have been located between the north side of the former MGP works building and the south side of the former coal house; however, the structure did not appear on any historical mapping. From September 2002 to January 2003 the NYSDEC oversaw the excavation and off-site disposal by SUNY's contractor of the structure, liquid material inside and outside the structure, and the surrounding soil containing visible impacts.

During the IRM excavation, sidewall samples were collected for laboratory analysis. When laboratory results indicated an exceedance of the cleanup objective of 500 milligrams per kilogram (mg/kg) total polycyclic aromatic hydrocarbons (PAHs) and/or 10 mg/kg total benzene, toluene, ethylbenzene, and xylenes (BTEX), or when visible coal tar was encountered, excavation continued. Excavation sidewall and bottom sampling results were presented in the *Report of Activities at LL-Lot* (SUNY, 2003). The report indicated that only one sidewall sample (located on the north excavation sidewall) did not meet the 500 mg/kg objective for PAHs (549.7 mg/kg PAHs were reported at that location).

The final excavation depth was approximately 20 feet bgs, terminating at the top of the fractured bedrock. An area near the center of the excavation was excavated an additional 5 feet into the fractured bedrock to approximately 25 feet bgs. Approximately 800 tons of tar-impacted soil and 3,200 gallons of impacted water that accumulated in the excavation were sent off site for disposal. The approximate location of the coal tar structure and the areal limits of the excavation are also shown on **Figure 2**. Structural fill was placed into the excavation and compacted.

RG&E conducted site characterization field activities between May 2015 and February 2016. The objectives of the site characterization were to:

- Gather information to evaluate whether MGP-related residuals remained in the subsurface.
- Determine whether MGP-related residual materials, if present, had a potential to pose a threat to public health or the environment.
- Determine whether a remedial investigation at the site was appropriate.

The results from the site characterization were presented in the *Site Characterization Report* (Arcadis 2016) (SC Report). The SC Report concluded that a remedial investigation was unnecessary because the nature and extent of MGP-related impacts (PAHs and volatile organic compounds [VOCs]) in soil and groundwater had been sufficiently defined for the purposes of

conducting a remedial alternatives analysis, and that petroleum (i.e., not MGP-related) may be the primary source of VOCs detected in both soil and groundwater within the study area. Similarly, while VOCs were detected in soil vapor samples collected from across the site, no MGP indicator compounds were present in any of the soil vapor samples. Gasoline indicators were; however, present in all but one of the samples while. Based on the types of VOCs detected, no evidence of MGP impacts existed in the soil vapor.

A seam of MGP-related non-aqueous phase liquid (NAPL) was detected within the weathered bedrock during the installation of MW-5, located immediately west of the former excavation.

RG&E prepared and submitted a July 7, 2017 *Alternatives Analysis Letter Report* (AA Letter Report) to the NYSDEC that compared several remedial alternatives for the site. The NYSDEC subsequently issued a *Decision Document* dated August 2017 that provided the elements of the NYSDEC-selected site remedy. The elements of the selected remedy include:

1) implementation of the remedial design program;

2) maintaining the existing site covers;

3) installation of an additional monitoring well;

4) imposition of an institutional control in the form of a Deed Restriction, and;

5) preparation of this SMP.

A plan providing the parameters, procedures, and applicable information and detail for installation of the additional monitoring well was provided to the NYSDEC on September 12, 2017. The additional monitoring well (MW-8) was installed hydraulically downgradient from MW-5 from October 8 to 10, 2017. No visual evidence of NAPL or sheens, or odors were detected during the installation of MW-8.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the site as listed in the Decision Document dated August 2017 are as follows:

2.4.1 Groundwater

<u>RAOs for Public Health Protection</u>:

- 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 groundwater 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.

2.4.2 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.

RAOs for Environmental Protection:

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

2.4.3 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 the site.

2.5 Remaining MGP Contamination

2.5.1 Soil

Soil containing one or more residual MGP contaminants above the applicable Unrestricted Use SCO was first encountered at approximately 4 feet bgs at various locations across the site. As the bedrock is between 8 to 18.5 ft. bgs, the layer of soil containing those residual MGP contaminants could potentially vary from 4 ft. to 14.5 ft. in thickness. There may be some residual MGP contaminants also present in the weathered bedrock which ranges another 0.3 ft. to 6 ft. bgs and the upper 10 feet of bedrock which was observed to be highly fractured; particularly downgradient of the former brick structure containing the coal tar-like materials excavated during the IRM.

During the excavation IRM conducted in 2002 to 2003, endpoint sidewall samples were

collected for laboratory analysis and the results compared to the (then current) NYSDEC *Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels* (TAGM 4046). Excavation endpoint sample results indicated that three of the four overburden sidewall samples met the TAGM 4046 levels for total BTEX (less than 10 mg/kg) and total PAHs (less than 500 mg/kg) (the north wall sample result indicated 549 mg/kg total PAHs). Additionally, each of the fractured bedrock (i.e., excavation bottom) samples met TAGM 4046 levels. A summary of the laboratory data and the laboratory data packages are included in the *Report of Activities at LL-Lot, SUNY Geneseo* (June 2003) (**Appendix C**). A figure showing the exact locations of the endpoint samples has not been identified.

During the site characterization conducted from 2015 to 2016, 22 soil samples were collected from 11 soil borings for laboratory analysis. Two additional soil samples were collected for laboratory analyses during installation of MW-8 in October 2017. Soil analytical results are provided in **Table 2** (detected results only). The complete list of the laboratory reported analytes for each analytical method is included in **Table 3**. In those tables, the results for each of the analyses are compared to the 6 NYSRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs) and Restricted Commercial Use SCOs.

BTEX were the only VOCs that exceeded Unrestricted Use SCOs (toluene in one sample; ethylbenzene in two samples; benzene in three samples, and; xylenes in four samples). Methylcyclohexane, xylenes (total), and cyclohexane were the most prevalent VOCs detected in subsurface soil. Methylcyclohexane, cyclohexane, and xylenes are commonly present in weathered gasoline. Methyl tertiary butyl ether (MtBE), an octane enhancing gasoline additive used since 1979 to help prevent engine knocking, was detected in soil samples collected from two locations (MW-3 and MW-6).

SVOCs were detected in 12 of the 22 soil samples with total SVOC concentrations ranging from below detection limits (12 samples) to 741,900 µg/kg in the soil sample collected from MW-1 (MW-1 is believed to be located within the backfill of the reported former excavation area).

BTEX and three PAHs have been identified in the Decision Document as the contaminants of potential concern (COPCs) for soil; specifically:

Benzene	Benzo(a)anthracene
Toluene	Benzo(a)pyrene
Ethylbenzene	Indeno(1,2,3-cd)pyrene
Xylenes (total)	

Figure 5 presents a summary of the VOC results and **Figure 6** presents a summary of the SVOC results of all soil samples collected during the site characterization and subsequent MW-8 installation that exceed the Unrestricted Use SCOs and the Restricted Commercial Use SCOs at the site after completion of the remedial action.

Based on the data collected, the depths to the top of soil with an impact(s) above an Unrestricted Use SCO is summarized in **Table 4**. As shown on the table, soil containing a COPC above an Unrestricted Use SCO is first encountered at approximately 4 feet bgs at various locations of the site. Locations of utility lines within the site identified during the site characterization activities are also shown on **Figure 2**.

2.5.2 Groundwater

The Decision Document also identified BTEX and the same three PAHs identified as soil COPCs (benzo(a)anthracene, benzo(a)pyrene, and indeno[1,2,3-cd]pyrene) as COPCs for groundwater. Based on the groundwater sampling completed during the site characterization, depth to groundwater across most of the site is 10 ft. to 15 ft. bgs. None of the PAH analytes associated with MGP operations were detected at concentrations above their respective groundwater guidance values; BTEX analytes, where existing, were only detected at concentrations slightly above groundwater standards. Similar to VOC data for soil, data suggests that petroleum is the primary source of VOCs detected in groundwater within the study area.

The VOC and SVOC analytes detected in groundwater are summarized in **Table 5** (detected analytes only); a complete list of the VOCs and SVOCs reported by the laboratory analytical methods are included in **Table 6**. Both tables present a comparison of reported data to *New York State Division of Water Technical and Operational Guidance Series 1.1.1* (TOGS 1.1.1) groundwater quality standards and/or guidance criteria. **Figure 7** presents the VOC results from groundwater samples collected during the site characterization; **Figure 8** presents the SVOC results. Monitoring well construction details are provided in **Table 7**.

2.5.3 Soil Vapor

Soil vapor samples were collected using SUMMA canisters in September 2015 from seven locations (SV-1 through SV-7) around the vicinity of the former MGP structures. Specifically, soil vapor samples were collected along the exterior of the eastern facade of the Brodie Fine Arts building, along the west side of the Brodie Fine Arts building within the courtyard, and north of the excavation area. Soil vapor samples were submitted for analysis by USEPA Compendium Method TO-15. The locations of the seven soil vapor sampling locations are also shown on **Figure 2.**

Results from the TO-15 analyses are summarized in **Table 8** (detected analytes only); a complete list of the VOCs reported by the laboratory analytical method is also included in **Table 9**. In general, BTEX compounds were detected in much lower concentrations than were non-MGP related chlorinated VOCs. Acetone and chloroform were the VOCs detected in the highest frequencies and in the highest relative concentrations. None of the "MGP-indicator" analytes included with the TO-15 analyses (indene, isooctane, or thiopenes) were detected in any of the soil gas samples. Gasoline indicators were present in 6 of the 7 soil vapor samples collected from across the site. Based on the types of analytes detected, no evidence of MGP impacts exist in the soil vapor.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining MGP contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required by the Decision Document to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This IC/EC Plan provides:

- Descriptions of the IC/ECs on the site;
- Descriptions of the basic implementation and intended role of each IC/EC;
- Descriptions of the key components of the ICs set forth in the Deed Restriction;
- Descriptions of the controls to be evaluated during each required inspection and periodic review;
- Descriptions 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 MGP contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

Subsequent to completion of the IRM, and under current use, existing site characterization data suggests there are no exposure routes to subsurface soil at the site; however, construction or maintenance workers performing invasive activities below 4 feet bgs could potentially be exposed to subsurface soil containing residual MGP-related impacts, and non-MGP related petroleum impacts. Imposition of an IC in the form of a Deed Restriction is required by the Decision Document to: (1) maintain and inspect, and periodically submit certification of institutional and engineering controls; (2) prevent future exposure to remaining MGP contamination; and, (3) limit the use and development of the site to non-residential, i.e., Commercial and Industrial uses only. Adherence to these ICs on the site is required by the Deed Restriction and will be implemented under this SMP. ICs identified in the Deed Restriction may not be discontinued without an amendment to or extinguishment of the Deed

Restriction. The IC boundaries are the site boundaries shown on **Figure 2**. These ICs are:

- The property may be used for non-residential, i.e., Commercial Uses as described in Part 375-1.8(g)(2)(iii) and Industrial Uses as described in Part 375-1.8(g)(2)(iv);
- The current cover materials at the site (i.e., parking area, access road, sidewalks, maintained vegetated areas, etc.) will be periodically inspected and maintained.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or Livingston 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.
- Groundwater and other environmental or public health 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 MGP contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of the physical components 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 Deed Restriction.
- The potential for vapor intrusion by residual MGP contamination must be evaluated for any buildings developed on the site within the IC boundaries noted on Figure 2, and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming on the site are prohibited;

3.3 Engineering Controls

A site cover currently exists and will be maintained to eliminate potential exposure to remaining MGP contamination at the site. Any site re-development will maintain the site cover materials. This cover may include paved surface parking areas, sidewalks, or soil where the top two feet of exposed surface soil meets the applicable SCOs for restricted residential

use. There is no demarcation layer above the residual MGP contamination which is present 4 feet bgs. Any fill material brought to the site will meet the requirements for the identified non-residential, i.e., Commercial or Industrial use as set forth in 6NYCRR Part 375-6.7(d).

The EWP provided in **Appendix D** outlines the procedures required to be implemented in the event the site cover is breached, penetrated or temporarily removed, and any underlying potential remaining MGP contamination is disturbed. 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 site- and task-specific Health and Safety Plan (HASP) and associated NYSDOH Community Air Monitoring Plan (CAMP) prepared for the site.

3.3.1 Criteria for Completion of Remediation

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.

3.3.3.1 Cover

The site cover is a permanent control and the quality and integrity of the cover materials 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 effectiveness of the remedy at reducing dissolved MGP-related COPCs at, and downgradient, from the site. Effectiveness monitoring is the periodic chemical and physical analysis of a media (e.g., groundwater) to determine if the remedial action objectives are being achieved. Performance monitoring is the regular assessment of the physical and chemical parameters of a treatment system to determine of the system is performing as designed. An active treatment system does not exist at the site (i.e., is not a requirement of the Decision Document); therefore, performance monitoring is not required, and no further reference/ discussion is included in this SMP.

This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling protocols and procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the site are included in the Generic Field Sampling Plan (GFSP) and Generic Quality Assurance Project Plan (GQAPP) provided in **Appendix E** and **Appendix F**, respectively. All field work will be conducted in accordance with a site- and task-specific HASP. A Generic HASP (GHASP) is presented in **Appendix G** that presents a general guide of the requirements for a contractor-prepared task-specific HASP for contractors performing field sampling activities, intrusive work, and/or performing monitoring and maintenance requirements specified in this SMP. Contractors must prepare their own, or have prepared for them by a qualified individual, task-specific HASP in compliance with DER-10 and 29 CFR 1910.29, CFR 1926, and all other applicable Federal, State, and local requirements. The NYSDOH's Generic CAMP is provided in **Appendix H** for guidance for preparation of a contractor-prepared CAMP specific for the work being conducted.

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

- Sampling and analysis of groundwater, indoor air, soil vapor, soils
- Assessing compliance with applicable NYSDEC standards and guidance values, particularly for ambient groundwater
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment

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

- Sampling locations, protocol and frequency;
- Information on monitoring systems (e.g., well logs);
- Fluid level monitoring procedures;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Annual inspection and periodic certification;

Reporting requirements are provided in **Section 7.0** of this SMP.

4.2 Site-Wide Inspections

As presented in the Decision Document, one of the elements of the remedy is to maintain surface cover materials to provide continued protection against potential human exposure to subsurface soil potentially containing MGP-related residuals. The surface cover is therefore subject to this SMP. Because potential MGP impacts can be encountered at depths as shallow as approximately 4 feet bgs, the annual inspections will focus on maintaining physical separation between site workers and any remaining MGP contamination. The evaluation will include a visual inspection of the stone, gravel, vegetative, concrete and/or asphalt covers for evidence of disturbance, erosion or removal of cover materials, settlement, or other pathways that could potentially result in exposure of on-site workers to subsurface MGP residuals. The NYSDEC shall be notified promptly of significant observations (e.g., observations where measures are needed to prevent contact with impacted soil) following inspection. Observed changes shall be documented in the annual periodic review report discussed in **Section 7.0**. Required repairs shall be made promptly.

Site-wide inspections will be performed once per year during the annual site visit. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after severe weather conditions that may affect ECs or site wells. During these inspections, a Site Inspection Form will be completed; a Site Inspection Form template is included in **Appendix I**. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs, including conditions of

cover materials and physical condition of site wells;

- General site conditions at the time of the inspection;
- site management activities being conducted Confirm
- The integrity of the protective road boxes and surrounding concrete/asphalt collars for wells identified in the monitoring plan;
- Locking caps exist for each well and are in good condition;
- Excessive settlement around each well has not occurred.

Inspections of all remedial components (i.e., monitoring wells) at the site will be conducted and repaired as needed. A comprehensive site-wide inspection will be conducted and documented annually 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 Deed Restriction.

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 an EC occurs that reduces or has the potential to reduce the effectiveness of the EC in place at the site, verbal notice to the NYSDEC must be given by noon of the following day after discovery. In addition, an inspection of the site will be conducted within 5 days of the event, or as soon as practical based on safety considerations, to verify the effectiveness of the IC/ECs by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the inspection that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Post-Remediation Effectiveness Monitoring and Sampling

Post-remediation groundwater sampling locations, required analytical parameters, and schedule are provided below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

4.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the effectiveness of

the remedy. Effectiveness monitoring requirements for an initial 5-year period are presented below. After the initial 5-year period of monitoring and sampling, based on the results obtained, RG&E and NYSDEC will evaluate the need to either: a) continue with the current monitoring plan for an additional period of time, b) modify the plan and continue monitoring for an additional period of time, or c) discontinue further monitoring. Recommended modifications, if any, will be included in the fifth annual Periodic Review Report (further discussed in **Section 7**). Modification to the frequency or sampling requirements will require approval from the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

A network of bedrock monitoring wells has been installed at the site to monitor upgradient, on-site and downgradient groundwater conditions. The locations of the site monitoring wells are shown on **Figure 2**.

Table 7 summarizes the well construction details, including identification numbers, northing and easting coordinates, ground surface elevation at each location, depths to bottom, and open and/or screened interval of each well. As part of the groundwater monitoring, the two on-site wells located hydraulically upgradient from the excavation area (MW-2 and MW-3), three on-site wells located in and immediately downgradient/crossgradient from the excavation area (MW-1, MW-4, and MW-6), and two off-site wells located hydraulically downgradient (MW-7 and MW-8) will be sampled to evaluate the effectiveness of the remedy.

Monitoring well MW-5 has contained measurable amounts of NAPL and; therefore, collection of groundwater for laboratory analysis is not included at this time. When appropriate, a recommendation to include groundwater sampling from MW-5 will be included in the annual Periodic Review Report. Monitoring well construction logs are included in **Appendix B** of this document.

The objectives of the effectiveness monitoring are to:

- Assess groundwater movement patterns using water-level data;
- Document the concentrations of dissolved COPCs (BTEX and PAHs, specifically the seven compounds identified in Section 2.5);
- Document dissolved COPC concentration trends to evaluate the effects of the remedy.

Water-level measurements during the first five years will be collected semi-annually (i.e., two

times per year) from the eight site wells. An interface probe (IP) capable of measuring NAPL will be used.

In addition, groundwater samples will be collected semi-annually during the first five years from the seven wells not containing NAPL (MW-1 through MW-4 and MW-6 through MW-8). An inspection and effectiveness monitoring schedule is included as **Table 10**.

Detailed sample collection and analytical procedures and protocols are provided in the GFSP (**Appendix E**) and the GQAPP (**Appendix F**). Groundwater samples will be sent for laboratory analysis of BTEX and PAHs. Analysis for PAHs will be conducted; however, the three PAH analytes identified in the Decision Document as COCs will be used to evaluate the effectiveness of the remedy. Sample quantities, including quality assurance/quality control (QA/QC) samples, and analytical requirements are included in the Sampling and Analysis Summary table (**Table 11**).

4.3.2 NAPL Gauging and Removal

Gauging of monitoring well MW-5 will be conducted quarterly during the first year of monitoring to determine if NAPL is accumulating in the well (also includes depth-to-water and depth-to-bottom of well). If accumulated NAPL is identified, it will be removed to the extent practicable using dedicated bailers, as appropriate and consistent with the GFSP. Recovered NAPL will be transferred to an appropriate collection container and temporarily staged onsite in SUNY's secure waste staging area until transportation and proper disposal is arranged by RG&E.

When applicable, gauging will be concurrent with the effectiveness monitoring events during the first year of monitoring. After this initial one-year period, if appropriate and approved by the NYSDEC, MW-5 will be monitored semi-annually during the effectiveness monitoring events rather than quarterly for the additional four years (i.e., years 2 through 5). The recommendation for modification of the gauging frequency (increase or decrease) will be included in the first annual Periodic Review Report, or any subsequent Periodic Review Report, if appropriate. The frequency of gauging may only be modified with approval of the NYSDEC. The schedule for the NAPL gauging for the first five years of system operation is also included in **Table 10.**

4.3.3 Repairs, Replacement, and Decommissioning

The monitoring wells may require periodic maintenance based on visual inspections. Maintenance activities will generally consist of:

- Replacing missing or broken locks;
- Repair/replacement of ground seals, protective casings, and locking caps.

If biofouling or silt accumulation occurs in a monitoring well(s), the well(s) will be physically agitated/surged and redeveloped. Additionally, a monitoring well(s) will be properly decommissioned and replaced, if an event renders the well(s) unusable.

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

The NYSDEC will be notified prior to any significant 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 annual Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled *CP-43: Groundwater Monitoring Well Decommissioning Policy*. 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.

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

4.3.4 Monitoring and Sampling Protocol

Monitoring well sampling activities will be recorded in a field book and low-flow parameters documented on the groundwater sampling log (or similar) provided in the GFSP (**Appendix E**). Other field observations (e.g., monitoring well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the monitoring network.

Well gauging, purging, and sampling methodology are included in the GFSP. Groundwater samples will be collected using low-flow purging and sampling techniques. Field parameters (i.e., pH, conductivity, DO, temperature, ORP, and turbidity) will be monitored every 3 to 5 minutes during purging (as appropriate). Groundwater samples will be collected for laboratory

analysis following the stabilization of field parameters and the reduction of turbidity levels to less than 50 nephelometric turbidity units (NTUs). Field parameters will be considered to have stabilized after three consecutive readings are within the following ranges:

- pH: +/- 0.1.
- Conductivity: +/- 3%.
- ORP: +/- 10 mV.
- DO: +/- 10 %.
- Turbidity: less than 50 NTUs.

If the field parameters have not stabilized after the well purging activities (and the groundwater turbidity level is less than 50 NTUs), field personnel will document the field parameters and collect the sample. If the field parameters have stabilized, but the turbidity of the groundwater exceeds 50 NTUs, the pump flow rate will be decreased to no more than 100 milliliters per minute (mL/min), and additional purging will be performed. The purging will continue until 50 NTUs turbidity is achieved or, if not possible, until reasonable effort has been made to reduce the turbidity to less than 50 NTUs.

5.0 MAINTENANCE PLAN

5.1 General

The site remedy 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. However, this plan describes the measures necessary to perform routine maintenance on the cover materials and groundwater monitoring system (i.e., monitoring wells). This Maintenance Plan provides a brief description of the measures necessary to monitor and maintain the components of the remedy selected for the site. This Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to inspect and maintain the cover materials and monitoring wells;
- Will be updated periodically to reflect changes in site conditions or the manner that the site is maintained.

A copy of this Maintenance Plan along with the complete SMP, is to be maintained at the SUNY campus. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component of this SMP.

5.2 Site Maintenance

A description of the non-mechanical Engineering Control (e.g., site cover) is provided in **Section 2.2**. Descriptions of the annual inspection monitoring requirements for the soil cover materials and monitoring wells are included in **Section 4.2**; periodic routine maintenance is described below.

Maintenance activities will be documented on the Site Inspection Form (**Appendix I**), and also be recorded in a dedicated field log book. The Site Inspection Form will be included in the Annual Periodic Review Report, as described in **Section 7**.

5.2.1 Surface Cover

To mitigate the potential future exposure of persons working at the site to remaining MGP residuals contamination, the surface covers must be maintained. If for any reason a cover material is to be repaired or replaced, new soil, gravel, asphalt, or concrete material will be replaced in kind. Sloughing, cracking, settling, and/or erosion of the cover identified during the

annual inspection will be repaired by placing additional cover material to meet, at a minimum, the original cover conditions, or taking other action as appropriate.

If subsurface disturbance occurs, the soil cover will be replaced in kind and consistent with the surrounding area and general use of that area.

5.2.2 Site Wells

The eight monitoring wells identified for gauging and/or sampling will be inspected during the annual site inspection.

Repairs, replacement, and decommissioning requirements are presented in **Section 4.3.3**.

Well redevelopment will be conducted as required, and in accordance with the procedures included in the GFSP. In addition to well re-development, the usage of an approved biocide and pumping may be required to reduce clogging of the screens due to bio-fouling.

5.3 Waste Handling

Miscellaneous wastes generated may be classified as general refuse or material impacted by MGP residuals. General refuse (material that has not contacted any MGP residuals or other potentially regulated substances) will be managed as a non-hazardous waste and is not subject to this SMP.

Materials that contact MGP residuals will be considered to be impacted by MGP residuals. These waste materials can include, but are not limited to:

- used disposable materials
- used PPE
- used sampling equipment

Miscellaneous wastes will be decontaminated (if visible residuals are present and if practicable), containerized, temporarily staged at the secure SUNY staging garage, and characterized, if necessary, prior to offsite disposal/treatment. Following characterization, the material will be labeled, transported, and disposed based on characterization results and in accordance with applicable rules and regulations.

Water and/or dense non-aqueous-phase liquid (DNAPL) generated from monitoring, bailing and/or maintenance activities, and materials generated during re-development of wells will be sampled, as appropriate, and submitted for laboratory characterization for off-site disposal.

After characterization, wastes will be transported off-site in accordance with applicable local, state, and federal laws, rules, and regulations.

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.

As described in **Section 2.3**, most of the site is covered by a paved parking lot (L-Lot), campus access road, and a sidewalk. A small landscaped area exists at the southern end of the parking lot. The site is not located in either the 100-year or 500-year flood plain, or in a low lying or low groundwater recharge area. Drainage from the paved surfaces is collected in catch basins located on the north and west sides of the parking lot and in the west side of the access road, and is moved to a storm sewer line located on the west side of the access road.

The unpaved area located at the southern end of the parking lot is primarily grassed with several mature trees and shrubs, and has limited potential for erosion; however, will be inspected and repaired if necessary during the annual site visits or after sever rain events. Because there are no mechanical or aboveground features associated with the site remedy, susceptibility to damage due to high winds or to power outages is not applicable. No chemicals are stored within the site boundaries; therefore, spillage or release of contaminants due to storm-related damage is not applicable.

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).

The site remedy requires maintenance of the site cover materials, periodic groundwater monitoring, and NAPL bailing from MW-5. As such, the site does not have a remedial system that requires electrical, fuel, or water usage, site lighting, or security systems, or produce emissions. Minimal waste generation will be associated with the bailing/purging of wells prior to sampling, and during the occasional maintenance re-development of wells; best practices will be used to minimize this waste and for handling.

6.2.1 Timing of Green Remediation Evaluations

As appropriate, recommendations will be presented in the PRR based on data collected to reduce site visits, thereby reducing emissions due to transportation to and from the site for inspections and/or sampling.

6.2.2 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the site and use of consumables in relation to visiting the site 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. The site visit and sampling schedule are presented in **Section 4**.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance, and monitoring events will be recorded on the appropriate Site Inspection Form provided in **Appendix I** and/or recorded in a site notebook, as appropriate. The form is subject to NYSDEC revision.

Applicable inspection forms and other records, including media sampling data and site maintenance reports generated for the site during the reporting period will be provided in electronic format to the NYSDEC in the Annual Periodic Review Report in accordance with the requirements of **Table 7-1**.

Table 7-1: Periodic Review Reporting Schedule

Task/Report	Reporting Frequency*
Periodic Review Report	Annually, or as otherwise determined by the Department and RG&E

* The reporting frequency will be conducted as specified until otherwise approved by the NYSDEC.

Routine maintenance event reporting forms/log book entries 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).

Non-routine maintenance event reporting forms/log book entries 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).

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

The first annual PRR will be submitted to the Department beginning sixteen (16) months after approval of the Certificate of Completion is issued pursuant to 6 NYCRR 375-1.9 and/or the Release and Covenant Not to Sue conferred by the NYSDEC pursuant to Subparagraph II.H of the VCA. After submittal of the initial annual PRR, the next PRR shall be submitted annually to the Department. In the event that the site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the site described in the Deed Restriction. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 60 days of the end of each certification period. Media sampling results will also be incorporated into the annual PRR. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- Applicable site management forms and other records generated during the reporting period in the NYSDEC-approved electronic format;
- A summary of monitoring data and/or information generated during the reporting period, with comments and conclusions;
- Data summary tables and graphical representations of COPCs by media that includes a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of analyses, copies of 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 evaluation, which includes the following:

- The compliance of the remedy with the requirements of the site Decision Document;
- Any new conclusions or observations regarding site COPCs 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;
- Trends in COPC levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document.
- The overall effectiveness of the remedy.

After the initial 5-year monitoring period, the fifth PRR will also include:

- An evaluation of the effectiveness monitoring data collected during the initial 5-year period
- An evaluation of the sampling program

Based on the results obtained, RG&E and NYSDEC will evaluate the need to either: a) continue with the current monitoring plan for an additional period of time, b) modify the plan (e.g., gauging or sampling frequency, MWs requiring sampling, etc.) and continue monitoring for an additional period of time, or c) discontinue further monitoring.

The annual PRR will be submitted in electronic format to the NYSDEC Central Office; an additional copy of the report in electronic format will be supplied upon request for NYSDEC distribution. The annual PRR may also need to be submitted in hard-copy format, as requested by the NYSDEC Project Manager.

7.2.1 Certification of Institutional and Engineering Controls

Each annual PRR will include a Certification Statement signed by an RG&E individual that the NYSDEC finds acceptable (e.g., a qualified environmental professional or Professional Engineer licensed to practice in New York State) the following certification as per the requirements of NYSDEC DER-10:

"*For each institutional or engineering control identified for the site, I certify that, to the best of my knowledge, all of the following statements are true:*

- *The inspection of the site to confirm the effectiveness of the EC/ICs required by the remedial program were performed under my direction;*
- *The EC and/or IC employed at this site is unchanged from the date the control was put in*

place, or last approved by the Department;

- *To my knowledge, nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *To my knowledge, nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided by SUNY 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;*
- *Based on an annual inspection, use of the site appears to be compliant with the Deed Restriction;*
- *The engineering control systems are performing as designed and appeared to be 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 and generally accepted engineering practices*
- *To my knowledge, the information presented in this report is accurate and complete.*

I certify that, to the best of my knowledge, 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 Designated Site Representative for the site."

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 IC or EC, a Corrective Measures Work Plan will be submitted to the NYSDEC 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.

8.0 REFERENCES

Arcadis, 2015. Site Characterization Work Plan, Park Street Former MGP Site, Geneseo, New York. July 2015.

Arcadis, 2016. Site Characterization Report, Park Street Former MGP Site, Geneseo, New York. May 2016.

Arcadis. Alternatives Analysis Letter Report, RG&E Park Street Former MGP Site, Village of Geneseo, Livingston County, New York, NYSDEC Site No. V00731. July 12, 2016

Arcadis. 2017. Installation of Monitoring Well MW-8. September 12, 2017.

Cadwell, D.H. 1988. Surficial geologic map of New York; Niagara Sheet, 1988. New York State Museum Map and Chart Series No. 40, scale 1:250,000

D.W. Fisher, Y.W. Isachsen, and L.V. Rickard. 1970. Geologic Map of New York State: Niagara Sheet, New York State Museum and Science Service, Map and Chart Series No. 15, scale 1:250000.

Geneseo Department of Environmental Health and Safety. 2003. Report of Activities at LL-Lot, SUNY Geneseo. June 2003.

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

NYSDEC, 2010. Division of Environmental Remediation. Decision Document, RGE Geneseo-Park St MGP, Voluntary Cleanup Program, Geneseo, Livingston County. Site No. V00731. August 2017

NYSDEC, 2010. Division of Environmental Remediation. DER-10 Technical Guidance for Site Investigation and Remediation. May 2010.

NYSDEC, 2009. CP-43: Groundwater Monitoring Well Decommissioning Policy. November 2009.

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).

Tables

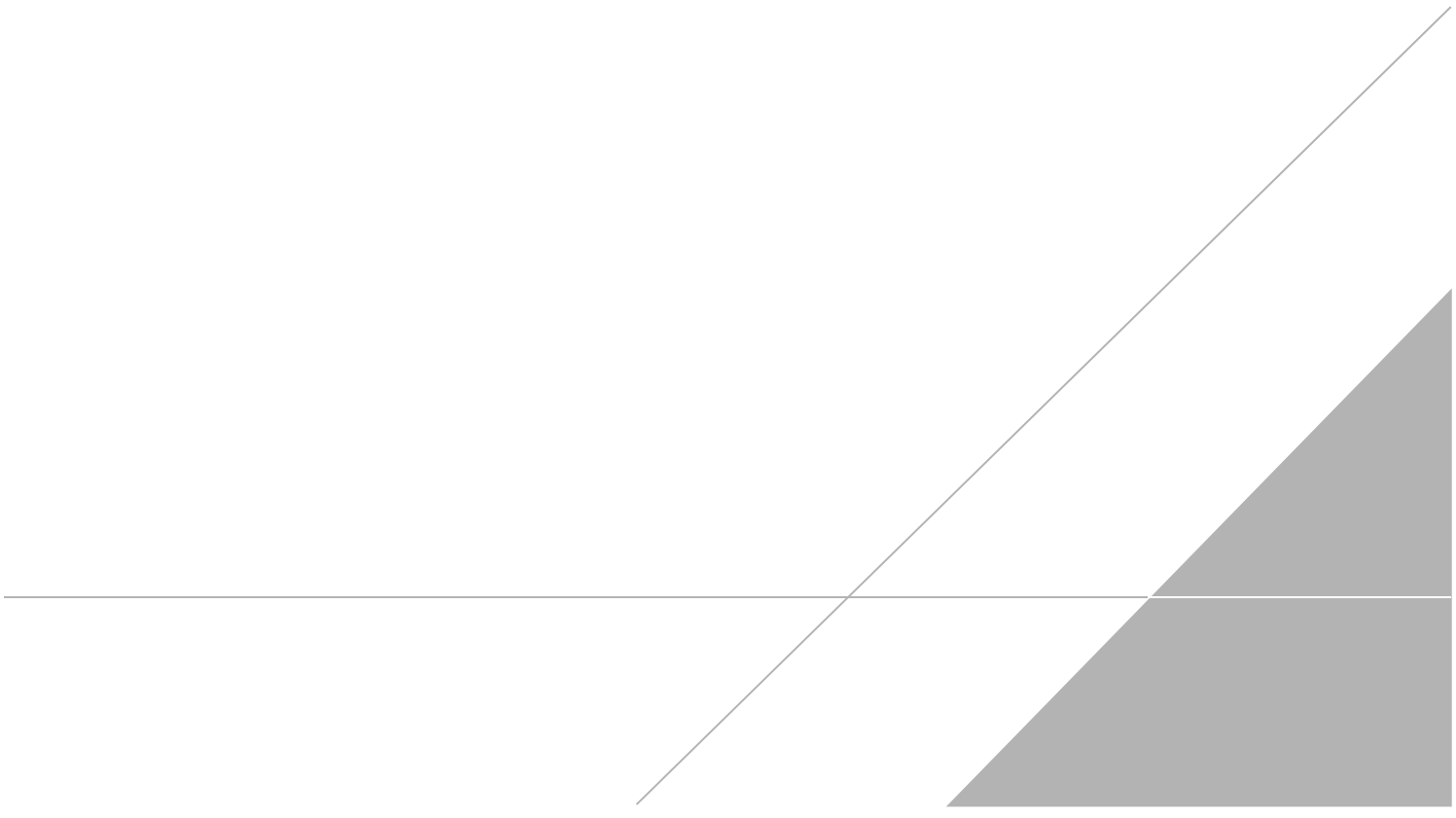


Table 1
Gauging Data

Site Management Plan
Park Street Former MGP Site

Well ID	Ground Surface Elevation	Top of Weathered Bedrock (feet bgs)	Top of Weathered Bedrock Elevation	Top of Competant Bedrock (feet bgs)	Top of Competant Bedrock Elevation	Monitored Interval* (ft bgs)	Measuring Point Elevation	Actual Depth to Bottom (feet TOC)	Date	Depth to Water (feet TOC)	Groundwater Elevation	Depth to Product (feet TOC)	Depth to Bottom (feet TOC)	Accumulated Thickness of Sediments (feet)
MW-1	758.42	11.0	747.42	14.5	743.92	16.5-36.5	758.41	35.84	8/31/2015	15.85	742.56	--	35.65	0.19
									10/1/2015	14.57	743.84	--	35.83	0.01
									12/17/2015	9.90	748.51	--	35.82	0.02
									1/5/2016	8.92	749.49	--	35.84	0.00
									2/4/2016	9.32	749.09	--	35.80	0.04
MW-2	760.29	13.0	747.29	15.0	745.29	17-37	760.25	36.65	8/31/2015	11.22	749.03	--	36.70	-0.05
									10/1/2015	10.73	749.52	--	36.70	-0.05
									12/17/2015	9.43	750.82	--	36.70	-0.05
									1/5/2016	9.40	750.85	--	36.72	-0.07
									2/4/2016	9.37	750.88	--	36.70	-0.05
MW-3	761.65	10.5	751.15	11.0	750.65	13-33	761.66	32.54	8/31/2015	12.20	749.46	--	32.58	-0.04
									10/1/2015	11.82	749.84	--	32.59	-0.05
									12/17/2015	10.45	751.21	--	32.57	-0.03
									1/5/2016	10.38	751.28	--	32.68	-0.14
									2/4/2016	10.43	751.23	--	32.56	-0.02
MW-4	756.07	14.5	741.57	18.5	737.57	20.5-40.5	756.18	39.70	8/31/2015	15.02	741.16	--	39.74	-0.04
									10/1/2015	15.27	740.91	--	39.72	-0.02
									12/17/2015	15.69	740.49	--	39.72	-0.02
									1/5/2016	16.09	740.09	--	39.75	-0.05
									2/4/2016	15.90	740.28	--	39.74	-0.04
MW-5	757.63	13.5	744.13	15.5	742.13	20-30	757.82	34.90	8/31/2015	16.04	741.78	--	34.72	0.18
									10/1/2015	16.38	741.44	34.49	34.89	0.01
									12/17/2015	17.09	740.73	33.80	34.90	0.00
									1/5/2016	16.45	741.37	34.74	35.09	-0.19
									2/4/2016	17.48	740.34	34.79	35.09	-0.19
									10/9/2017	18.70	739.12	33.65	35.09	-0.19
MW-6	757.55	9.0	748.55	15.0	742.55	17-37	757.73	37.39	8/31/2015	15.64	742.09	--	37.35	0.04
									10/1/2015	15.73	742.00	--	37.35	0.04
									12/17/2015	15.90	741.83	--	37.33	0.06
									1/5/2016	15.96	741.77	--	37.33	0.06
									2/4/2016	16.11	741.62	--	37.35	0.04
MW-7	743.96	8.0	735.96	8.3	735.66	10.5-30.5	744.07	29.28	8/31/2015	6.37	737.70	--	29.94	-0.66
									10/1/2015	5.86	738.21	--	30.00	-0.72
									12/17/2015	6.57	737.50	--	29.95	-0.67
									1/5/2016	6.24	737.83	--	30.02	-0.74
									2/4/2016	6.43	737.64	--	30.04	-0.76

Notes:

ft bgs - feet below ground surface

TOC - top of casing

Elevations in feet above mean sea level (ft amsl), 1988 North American Vertical Datum (NAVD88).

Monitoring wells MW-1, MW-2, MW-3, MW-4, MW-6 and MW-7 are open bedrock wells; MW-5 is screened from 20 to 30 feet bgs and has a 5 foot long sump.

* Monitored Interval is 2 feet below top of competent bedrock to bottom of hole (MW-1, MW-2, MW-3, MW-4 MW-6, and MW-7) or to top of sump (MW-5)

Table 2
Soil Analytical Results (Detected Analytes Only)

Site Management Plan
Park Street Former MGP Site

Location ID:	Unrestricted Use SCOs	Restricted Use SCOs Commercial	Units	MW-1	MW-1	MW-2	MW-2	MW-3	MW-3	MW-4	MW-4	MW-5	MW-5	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8	SB-1	SB-1	SB-2	SB-2	SB-3	SB-3	SB-5	SB-5
Sample Depth(Feet BGS):				5 - 7	9 - 11	5 - 7	9 - 13	7 - 9	9 - 10.2	5 - 7	13 - 14.5	10 - 12	12 - 14	9 - 11	13 - 14.2	4 - 6	6 - 8.3	4 - 6	13 - 14	7 - 9	9 - 11	7 - 9	9 - 11	7 - 9	9 - 11	9 - 11	11 - 13.5
Date Collected:				08/11/15	08/11/15	08/12/15	08/12/15	08/13/15	08/13/15	08/10/15	08/10/15	08/11/15	08/11/15	08/12/15	08/12/15	08/12/15	08/12/15	10/08/17	10/08/17	08/13/15	08/13/15	08/13/15	08/13/15	08/13/15	08/13/15	08/14/15	08/14/15
Volatile Organic Compounds																											
1,2-Dichloroethane	20	30,000	ug/kg	4.0 U	4.9 U	3.8 U	**0.32 J**	410 U	**1.6 J**	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.25 UJ	0.22 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Acetone	50	500,000	ug/kg	**35**	**8.4 J**	22 UB	18 U	2,000 U	15 U	29 UJ	**40 J**	**14 J**	**28**	21 U	**6.4 J**	20 UB	19 UB	**13 J**	**21 J**	17 U	20 UB	1,700 U	18 UB	18 U	19 UB	19 U	18 UB
Benzene	60	44,000	ug/kg	**2,300 D**	**0.72 J**	3.8 U	3.7 U	**100 J**	**2.0 J**	5.9 UJ	4.1 UJ	**48**	**6,000 D**	**0.39 J**	4.1 U	4.0 U	3.8 U	**1.5 J**	0.22 U	3.4 U	3.9 U	350 U	**2.4 J**	3.6 U	3.7 U	**1.2 J**	**1.8 J**
Cyclohexane	- -	- -	ug/kg	**2.5 J**	4.9 U	3.8 U	3.7 U	**1,500 J**	**23**	5.9 UJ	4.1 UJ	**2.4 J**	**3.3 J**	4.2 U	**2.5 J**	4.0 U	3.8 U	0.71 U	0.62 U	3.4 U	**2.7 J**	**5,000 J**	**2,300 D**	3.6 U	**2.4 J**	3.8 U	3.6 U
Ethylbenzene	1,000	390,000	ug/kg	**92**	4.9 U	3.8 U	3.7 U	**2,500 J**	**1.5 J**	5.9 UJ	4.1 UJ	**47**	**5,900 D**	**0.33 J**	4.1 U	4.0 U	**0.91 J**	0.35 UJ	0.30 U	3.4 U	3.9 U	**370**	**37**	3.6 U	3.7 U	3.8 U	**0.57 J**
Isopropylbenzene	- -	- -	ug/kg	**19**	4.9 U	3.8 U	3.7 U	**320 J**	3.1 U	5.9 UJ	4.1 UJ	**4.0**	**14**	4.2 U	4.1 U	4.0 U	3.8 U	0.76 U	0.66 U	3.4 U	3.9 U	**370**	**22**	3.6 U	3.7 U	3.8 U	3.6 U
Methyl tert-butyl ether	930	500,000	ug/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	**7.9**	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	**0.70 J**	4.0 U	3.8 U	0.49 U	0.43 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Methylcyclohexane	- -	- -	ug/kg	**3.1 J**	4.9 U	**0.91 J**	3.7 U	**4,900 J**	**25**	5.9 UJ	4.1 UJ	**3.1 J**	**4.6**	4.2 U	**2.6 J**	4.0 U	**2.4 J**	0.77 U	0.67 U	3.4 U	**2.7 J**	**17,000**	**7,600 D**	**2.3 J**	**2.5 J**	3.8 U	3.6 U
Styrene	- -	- -	ug/kg	**63**	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	**14**	4.2 U	4.1 U	4.0 U	3.8 U	**0.28 J**	0.22 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	**0.70 J**	3.6 U
Tetrachloroethene	1,300	150,000	ug/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.68 U	**0.70 J**	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Toluene	700	500,000	ug/kg	**6,100 D**	**1.4 J**	**0.52 J**	3.7 U	410 U	**0.25 J**	5.9 UJ	4.1 UJ	**5.9**	**59**	4.2 U	**0.43 J**	4.0 U	3.8 U	**1.8 J**	0.33 U	3.4 U	3.9 U	350 U	**10**	3.6 U	3.7 U	**2.6 J**	3.6 U
Xylenes (total)	260	500,000	ug/kg	**950**	**1.6 J**	**1.2 J**	7.4 U	**14,000 J**	**5.6 J**	12 UJ	8.1 UJ	**170**	**480**	8.4 U	8.2 U	**1.0 J**	**6.4 J**	**0.85 J**	0.74 U	6.8 U	7.9 U	**1,100**	**67**	7.1 U	7.5 U	**3.5 J**	7.2 U
Total BTEX	- -	- -	µg/kg	**9,442**	**3.7 J**	**1.7 J**	BDL	**16,600 J**	**9.4 J**	BDL	BDL	**271**	**12,439**	**0.72 J**	**0.43 J**	**1.0 J**	**7.3 J**	**4.2 J**	BDL	BDL	BDL	**1,470**	**116 J**	BDL	BDL	**7.3 J**	**2.4 J**
Total Volatile Organic Compounds (VOCs)	- -	- -	µg/kg	**9,565 J**	**12.1 J**	**2.63 J**	**0.32 J**	**23,320 J**	**66.5 J**	BDL	**40 J**	**294 J**	**12,503 J**	**0.72 J**	**12.6 J**	**1.0 J**	**9.71 J**	**17.4 J**	**23.1 J**	BDL	**5.4 J**	**23,840 J**	**10,038 J**	**2.3 J**	**4.9 J**	**8.0 J**	**2.37 J**
Semivolatile Organic Compounds																											
2,4-Dimethylphenol	- -	- -	µg/kg	**5,300**	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	4,800 UJ	250 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2-Methylnaphthalene	- -	- -	µg/kg	**60,000**	200 U	920 U	1,800 U	**1,200 J**	3,600 U	2,100 U	200 U	**5,300**	**1,700 J**	180 U	890 U	980 U	9,300 U	4,000 UJ	**220 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2-Methylphenol	330	500,000	µg/kg	**3,600 J**	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,400 UJ	120 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
4-Methylphenol	330	500,000	µg/kg	**5,900 J**	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	2,400 UJ	120 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
Acenaphthene	20,000	500,000	µg/kg	**9,700**	200 U	920 U	1,800 U	3,600 U	3,600 U	**770 J**	200 U	**2,600**	**840 J**	180 U	890 U	980 U	9,300 U	**3,800 J**	**290 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Acenaphthylene	100,000	500,000	µg/kg	**11,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**910 J**	200 U	**12,000**	**3,500**	180 U	890 U	980 U	9,300 U	**17,000 J**	**1,000**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**8,600 J**	4,000 U
Anthracene	100,000	500,000	µg/kg	**33,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**3,600**	200 U	**20,000**	**6,400**	180 U	890 U	980 U	9,300 U	**40,000 J**	**1,800**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**18,000 J**	4,000 U
Benzo(a)anthracene	1,000	5,600	µg/kg	**30,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**14,000**	**70.0 J**	**20,000**	**11,000**	180 U	890 U	980 U	9,300 U	**87,000 J**	**2,100**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**36,000 J**	**800 J**
Benzo(a)pyrene	1,000	1,000	µg/kg	**20,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**16,000**	**120 J**	**15,000**	**7,400**	180 U	890 U	980 U	9,300 U	**69,000 J**	**1,500**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**30,000 J**	**740 J**
Benzo(b)fluoranthene	1,000	5,600	µg/kg	**22,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**18,000**	**160 J**	**17,000**	**8,400**	180 U	890 U	980 U	9,300 U	**83,000 J**	**1,600**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**32,000 J**	4,000 U
Benzo(g,h,i)perylene	100,000	500,000	µg/kg	**9,100**	200 U	920 U	1,800 U	3,600 U	3,600 U	**11,000**	**70.0 J**	**7,200**	**3,400**	180 U	890 U	980 U	9,300 U	**38,000 J**	**720 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**16,000 J**	4,000 U
Benzo(k)fluoranthene	800	56,000	µg/kg	**9,200**	200 U	920 U	1,800 U	3,600 U	3,600 U	**8,700**	200 U	**7,800**	**4,900**	180 U	890 U	980 U	9,300 U	**34,000 J**	**700 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**25,000 J**	4,000 U
Biphenyl	- -	- -	µg/kg	**9,400**	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	**3,200**	**970 J**	180 U	890 U	980 U	9,300 U	3,000 UJ	150 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
bis(2-Ethylhexyl)phthalate	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	**130 J**	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	6,800 UJ	350 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Carbazole	- -	- -	µg/kg	**9,500**	200 U	920 U	1,800 U	3,600 U	3,600 U	**1,200 J**	200 U	**4,300**	**1,100 J**	180 U	890 U	980 U	9,300 U	2,400 UJ	**250 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**2,500 J**	4,000 U
Chrysene	1,000	56,000	µg/kg	**23,000**	**84.0 J**	920 U	1,800 U	3,600 U	3,600 U	**12,000**	**87.0 J**	**15,000**	**7,800**	180 U	890 U	980 U	9,300 U	**70,000 J**	**1,500**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**45,000 J**	**1,200 J**
Dibenzo(a,h)anthracene	330	560	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	**94.0 J**	**3,000**	**2,000**	180 U	890 U	980 U	9,300 U	3,500 UJ	180 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**5,000 J**	4,000 U
Dibenzofuran	7,000	350,000	µg/kg	**28,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**650 J**	200 U	**13,000**	**3,600**	180 U	890 U	980 U	9,300 U	**9,100 J**	**950 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**4,400 J**	4,000 U
Fluoranthene	100,000	500,000	µg/kg	**58,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**18,000**	**93.0 J**	**39,000**	**20,000**	180 U	890 U	980 U	9,300 U	**170,000 J**	**4,200 J**	**340 J**	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**82,000 J**	**1,800 J**
Fluorene	30,000	500,000	µg/kg	**35,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**1,100 J**	200 U	**18,000**	**5,300**	180 U	890 U	980 U	9,300 U	**18,000 J**	**1,600**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**8,800 J**	4,000 U
Indeno(1,2,3-cd)pyrene	500	5,600	µg/kg	**9,200**	200 U	920 U	1,800 U	3,600 U	3,600 U	**11,000**	**100 J**	**7,400**	**4,000**	180 U	890 U	980 U	9,300 U	**36,000 J**	**790 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**15,000 J**	4,000 U
Naphthalene	12,000	500,000	µg/kg	**160,000 D**	200 U	920 U	1,800 U	**940 J**	3,600 U	**600 J**	200 U	**27,000**	**9,600**	180 U	890 U	980 U	9,300 U	2,600 UJ	130 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Phenanthrene	100,000	500,000	µg/kg	**140,000 D**	200 U	920 U	1,800 U	3,600 U	3,600 U	**9,400**	**47.0 J**	**44,000**	**16,000**	180 U	890 U	980 U	9,300 U	**110,000 J**	**5,000 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**59,000 J**	**1,700 J**
Pyrene	100,000	500,000	µg/kg	**51,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**16,000**	**83.0 J**	**30,000**	**15,000**	180 U	890 U	980 U	9,300 U	**130,000 J**	**3,300 J**	**280 J**	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**71,000 J**	**1,300 J**
Total Polycyclic Aromatic Hydrocarbons (PAHs)	- -	- -	µg/kg	**620,200**	**84.0 J**	BDL	BDL	**940 J**	BDL	**141,080 J**	**924 J**	**285,000**	**125,540**	BDL	BDL	BDL	BDL	**818,800 J**	**24,000 J**	**620 J**	BDL	BDL	BDL	BDL	BDL	**451,400 J**	**7,540 J**
Total Semivolatile Organic Compounds (SVOCs)	- -	- -	µg/kg	**741,900 J**	**84.0 J**	BDL	BDL	**2,140 J**	BDL	**142,930 J**	**1,054 J**	**310,800**	**132,910 J**	BDL	BDL	BDL	BDL	**914,900 J**	**27,300 J**	**620 J**	BDL	BDL	BDL	BDL	BDL	**458,300 J**	**7,540 J**

Table 2
Soil Analytical Results (Detected Analytes Only)

Site Management Plan
Park Street Former MGP Site

Location ID: / Sample Depth(Feet BGS): / Date Collected:	Unrestricted Use SCOs	Restricted Use SCOs Commercial	Units	MW-1 5 - 7 08/11/15	MW-1 9 - 11 08/11/15	MW-2 5 - 7 08/12/15	MW-2 9 - 13 08/12/15	MW-3 7 - 9 08/13/15	MW-3 9 - 10.2 08/13/15	MW-4 5 - 7 08/10/15	MW-4 13 - 14.5 08/10/15	MW-5 10 - 12 08/11/15	MW-5 12 - 14 08/11/15	MW-6 9 - 11 08/12/15	MW-6 13 - 14.2 08/12/15	MW-7 4 - 6 08/12/15	MW-7 6 - 8.3 08/12/15	MW-8 4 - 6 10/08/17	MW-8 13 - 14 10/08/17	SB-1 7 - 9 08/13/15	SB-1 9 - 11 08/13/15	SB-2 7 - 9 08/13/15	SB-2 9 - 11 08/13/15	SB-3 7 - 9 08/13/15	SB-3 9 - 11 08/13/15	SB-5 9 - 11 08/14/15	SB-5 11 - 13.5 08/14/15
Petroleum Hydrocarbons																											
Diesel, Fuel Oil #2, C10-C23	- -	- -	mg/kg	NA	NA	NA	NA	**150**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fuel Oil #4	- -	- -	mg/kg	NA	NA	NA	NA	18.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fuel Oil #6	- -	- -	mg/kg	NA	NA	NA	NA	18.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gasoline	- -	- -	mg/kg	NA	NA	NA	NA	**210**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kerosene	- -	- -	mg/kg	NA	NA	NA	NA	**140**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Motor Oils	- -	- -	mg/kg	NA	NA	NA	NA	**160**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unknown Hydrocarbon1	- -	- -	mg/kg	NA	NA	NA	NA	18.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics																											
Aluminum	- -	- -	mg/kg	**16,600 J**	**17,100 J**	**11,200 J**	**16,700 J**	**10,400 J**	**12,700 J**	**9,860 J**	**17,800 J**	**16,400 J**	**15,300 J**	**15,100 J**	**17,900 J**	**20,300 J**	**15,700 J**	**15,400**	**15,100**	**12,600**	**15,500**	**11,200**	**12,800**	**14,400**	**14,100**	**17,300**	**18,600**
Antimony	- -	- -	mg/kg	17.8 UJ	17.5 UJ	16.6 UJ	16.3 UJ	15.8 UJ	15.1 UJ	18.7 UJ	16.7 UJ	**0.990 J**	16.8 UJ	15.6 UJ	15.9 UJ	16.6 UJ	16.8 UJ	0.470 UJ	0.470 UJ	19.0 U	17.5 U	**0.650 J**	16.0 U	16.2 U	15.7 U	18.6 U	18.0 U
Arsenic	13	16	mg/kg	**2.20 J**	**2.90**	**3.60**	**4.00**	**3.60**	**3.60**	**23.9**	**6.60**	**3.90**	**4.80**	**2.80**	**3.50**	**2.40**	**5.60**	**18.5**	**2.30 J**	**7.30**	**3.40**	**3.70**	**4.00**	**4.10**	**3.80**	**5.00**	**3.60**
Barium	350	400	mg/kg	**66.3 J**	**86.4 J**	**55.3 J**	**67.7 J**	**44.3 J**	**47.2 J**	**95.3 J**	**63.9 J**	**168 J**	**69.5 J**	**98.9 J**	**58.8 J**	**75.1 J**	**57.8 J**	**184**	**45.9**	**92.7**	**54.9**	**48.3**	**99.5**	**71.1**	**63.6**	**123**	**76.6**
Beryllium	7.2	590	mg/kg	**0.820**	**0.830**	**0.550**	**0.820**	**0.490**	**0.640**	**0.900**	**0.950**	**0.820**	**0.750**	**0.760**	**0.920**	**0.880**	**0.740**	**0.960**	**0.890**	**0.580**	**0.790**	**0.590**	**0.690**	**0.750**	**0.750**	**0.860**	**0.960**
Cadmium	2.5	9.3	mg/kg	**0.0370 J**	**0.0410 J**	**0.0940 J**	**0.0340 J**	**0.140 J**	**0.0720 J**	**0.290**	**0.130 J**	**0.0530 J**	**0.260**	**0.0560 J**	0.210 U	**0.0740 J**	**0.160 J**	**1.10**	0.0350 U	**0.150 J**	**0.0640 J**	**0.0610 J**	0.210 U	0.220 U	**0.0360 J**	**0.610**	**0.0570 J**
Calcium	- -	- -	mg/kg	**56,600 J**	**45,300 J**	**72,200 J**	**53,400 J**	**54,500 J**	**59,200 J**	**49,500 J**	**12,900 J**	**40,000 J**	**35,000 J**	**45,300 J**	**22,600 J**	**37,500 J**	**46,500 J**	**26,100**	**16,800**	**24,000**	**37,900**	**60,400**	**71,300**	**56,300**	**47,600**	**8,180**	**11,400**
Chromium	- -	- -	mg/kg	**24.7 J**	**26.1 J**	**16.8 J**	**24.3 J**	**15.1 J**	**19.2 J**	**15.7 J**	**26.6 J**	**24.8 J**	**22.9 J**	**22.9 J**	**27.2 J**	**26.4 J**	**24.3 J**	**31.3 J**	**21.8 J**	**16.8**	**25.3**	**17.5**	**20.2**	**22.4**	**22.3**	**23.9**	**28.8**
Cobalt	- -	- -	mg/kg	**13.5**	**13.7**	**10.4**	**15.4**	**10.8**	**12.5**	**6.50**	**15.4**	**14.9**	**14.5**	**13.4**	**14.7**	**8.70**	**10.7**	**13.1 J**	**8.90 J**	**8.60**	**15.1**	**10.8**	**12.2**	**14.2**	**15.5**	**12.2**	**17.1**
Copper	50	270	mg/kg	**27.8**	**28.0**	**27.7 J**	**30.5 J**	**32.1 J**	**28.0 J**	**49.0**	**42.2**	**26.6**	**31.0**	**27.0**	**28.3**	**17.3 J**	**34.1 J**	**60.5 J**	**26.2 J**	**27.4**	**27.1**	**26.5**	**29.1**	**29.2**	**28.0**	**18.4**	**27.0**
Cyanide	27	27	mg/kg	1.10 U	**0.860 J**	1.10 U	**1.10**	1.00 U	1.10 U	**5.80**	1.10 U	**2.90**	**3.80**	1.00 U	1.00 U	1.10 U	1.10 U	NA	NA	1.20 U	1.20 U	1.10 U	1.00 U	1.10 U	1.00 U	**469**	1.20 U
Iron	- -	- -	mg/kg	**20,200 J**	**23,800 J**	**16,500 J**	**21,400 J**	**15,500 J**	**18,300 J**	**11,000 J**	**27,100 J**	**23,800 J**	**24,300 J**	**21,300 J**	**24,100 J**	**19,300 J**	**21,100 J**	**25,000 J**	**17,900 J**	**17,100**	**24,500**	**17,100**	**19,700**	**21,400**	**21,700**	**23,300**	**27,300**
Lead	63	1,000	mg/kg	**10.1**	**10.1**	**12.2**	**12.2**	**12.2**	**13.8**	**138**	**22.3**	**10.9**	**14.3**	**9.70**	**11.8**	**9.10**	**13.2**	**679 J**	**8.80 J**	**130**	**13.4**	**12.2**	**13.4**	**12.1**	**11.4**	**63.6**	**13.5**
Magnesium	- -	- -	mg/kg	**7,830 J**	**8,340 J**	**17,200 J**	**7,380 J**	**12,700 J**	**9,390 J**	**3,640 J**	**6,780 J**	**7,800 J**	**7,460 J**	**7,400 J**	**9,170 J**	**7,770 J**	**6,450 J**	**5,870 J**	**5,420 J**	**6,110**	**8,300**	**11,100**	**7,240**	**7,540**	**7,570**	**5,550**	**7,880**
Manganese	1,600	10,000	mg/kg	**345 J**	**333 J**	**321 J**	**410 J**	**368 J**	**345 J**	**197 J**	**285 J**	**302 J**	**284 J**	**295 J**	**269 J**	**254 J**	**249 J**	**308 J**	**173 J**	**332**	**355**	**349**	**388**	**361**	**360**	**389**	**307**
Mercury	0.18	2.8	mg/kg	**0.0230**	**0.0140 J**	**0.0190**	**0.0180 J**	**0.00890 J**	**0.0170 J**	**0.200**	**0.0320**	**0.0300**	**0.0200**	**0.0170 J**	**0.0150 J**	**0.0570**	**0.0260**	**0.350**	**0.0130 J**	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	30	310	mg/kg	**43.3**	**44.5**	**34.0**	**42.2**	**32.4**	**38.9**	**20.8**	**54.2**	**42.1**	**41.0**	**40.4**	**42.9**	**36.7**	**46.8**	**39.1 J**	**33.3 J**	**24.8**	**45.4**	**34.2**	**39.1**	**42.9**	**41.6**	**35.7**	**48.0**
Potassium	- -	- -	mg/kg	**3,650 J**	**3,470 J**	**2,750 J**	**3,850 J**	**2,700 J**	**3,070 J**	**1,450 J**	**3,840 J**	**3,550 J**	**3,030 J**	**3,110 J**	**3,980 J**	**4,200 J**	**3,520 J**	**4,310 J**	**4,350 J**	**2,720**	**3,000**	**2,510**	**2,990**	**3,020**	**3,010**	**2,960**	**3,120**
Selenium	3.9	1,500	mg/kg	4.70 U	4.70 U	4.40 U	**0.500 J**	4.20 U	4.00 U	**0.560 J**	4.50 U	**1.00 J**	4.50 U	4.10 U	**0.460 J**	**0.780 J**	**2.10 J**	**4.00 J**	**0.470 J**	**0.580 J**	4.70 U	**1.00 J**	**0.440 J**	4.30 U	**0.650 J**	**0.730 J**	4.80 U
Silver	2	1,500	mg/kg	0.710 U	0.700 U	0.660 U	0.650 U	0.630 U	0.600 U	0.750 U	0.670 U	0.710 U	0.670 U	0.620 U	0.630 U	0.660 U	0.670 U	**0.260 J**	0.240 U	0.760 U	0.700 U	0.630 U	0.640 U	0.650 U	0.630 U	0.740 U	0.720 U
Sodium	- -	- -	mg/kg	**226**	**212**	**524**	**235**	**173**	**234**	**736**	**173**	**523**	**472**	**427**	**240**	**186**	**189**	**565**	**411**	**916**	**627**	**407**	**264**	**642**	**327**	**752**	**321**
Vanadium	- -	- -	mg/kg	**21.6 J**	**20.9 J**	**17.7 J**	**21.8 J**	**17.6 J**	**19.1 J**	**21.9 J**	**24.7 J**	**20.8 J**	**18.7 J**	**19.2 J**	**22.7 J**	**26.7 J**	**25.7 J**	**29.1 J**	**22.5 J**	**21.8**	**19.7**	**16.9**	**17.1**	**18.6**	**17.7**	**27.6**	**23.9**
Zinc	109	10,000	mg/kg	**56.1 J**	**71.7 J**	**57.7 J**	**56.2 J**	**66.2 J**	**50.8 J**	**135 J**	**90.5 J**	**69.9 J**	**203 J**	**75.4 J**	**52.2 J**	**64.7 J**	**82.1 J**	**482 J**	**35.9 J**	**99.9**	**76.0**	**52.4**	**50.8**	**50.8**	**63.5**	**887**	**79.0**

Notes:

1. Samples were submitted to Test America, Amherst, New York for analysis using USEPA SW-846 Methods 8260B (VOCs), 8270D (SVOCs), 6010C (Inorganics), 9012B (Total Cyanide), 310.13 (Hydrocarbon Identification).
2. Samples from monitoring wells MW-3 and MW-4 were submitted to Test America, Amherst, New York for additional analysis of carbon dioxide, methane, sulfide, nitrate, nitrite, and dissolved iron and manganese.
3. Results are presented in units of micrograms per liter (µg/L) and milligrams per liter (mg/L), as identified.
4. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
5. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
6. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
7. D - Compound quantitated using a secondary dilution.
8. NA - not analyzed
9. BDL - Below method detection limits.
10. BGS - Below ground surface.
11. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
12. Gray Shading indicates the result exceeds NYSDEC Part 375 Soil Cleanup Objectives (SCO) for Unrestricted use (Unrestricted use SCO).
13. Yellow Shading indicates the result exceeds NYSDEC Part 375 Soil Cleanup Objectives (SCO) for Commercial use (Commercial use SCO).
14. - - Indicates a standard or guidance value does not exist for the respective analyte.

Table 3
Soil Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Sample Depth(Feet BGS): / Date Collected:	Unrestricted Use SCOs	Restricted Use SCOs Commercial	Units	MW-1 5 - 7 08/11/15	MW-1 9 - 11 08/11/15	MW-2 5 - 7 08/12/15	MW-2 9 - 13 08/12/15	MW-3 7 - 9 08/13/15	MW-3 9 - 10.2 08/13/15	MW-4 5 - 7 08/10/15	MW-4 13 - 14.5 08/10/15	MW-5 10 - 12 08/11/15	MW-5 12 - 14 08/11/15	MW-6 9 - 11 08/12/15	MW-6 13 - 14.2 08/12/15	MW-7 4 - 6 08/12/15	MW-7 6 - 8.3 08/12/15	MW-8 4 - 6 10/08/17	MW-8 13 - 14 10/08/17	SB-1 7 - 9 08/13/15	SB-1 9 - 11 08/13/15	SB-2 7 - 9 08/13/15	SB-2 9 - 11 08/13/15	SB-3 7 - 9 08/13/15	SB-3 9 - 11 08/13/15	SB-5 9 - 11 08/14/15	SB-5 11 - 13.5 08/14/15
Volatile Organic Compounds																											
1,1,1-Trichloroethane	680	500,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.37 U	0.32 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,1,2,2-Tetrachloroethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	0.82 UJ	0.71 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,1,2-trichloro-1,2,2-trifluoroethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	1.1 U	1.0 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,1,2-Trichloroethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.65 UJ	0.57 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,1-Dichloroethane	270	240,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.61 U	0.54 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,1-Dichloroethene	330	500,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.62 U	0.54 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,2,4-Trichlorobenzene	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	0.31 UJ	0.27 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,2-Dibromo-3-chloropropane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 UJ	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	2.5 UJ	2.2 U	3.4 U	3.9 U	350 UJ	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,2-Dibromoethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	0.65 UJ	0.57 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,2-Dichlorobenzene	1,100	500,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	0.39 UJ	0.34 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,2-Dichloroethane	20	30,000	µg/kg	4.0 U	4.9 U	3.8 U	**0.32 J**	410 U	**1.6 J**	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.25 UJ	0.22 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,2-Dichloropropane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	2.5 U	2.2 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,3-Dichlorobenzene	2,400	280,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	0.26 UJ	0.23 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
1,4-Dichlorobenzene	1,800	130,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	0.71 UJ	0.62 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
2-Butanone	120	500,000	µg/kg	20 U	24 U	19 U	18 U	2,000 U	15 U	29 UJ	20 UJ	19 U	19 U	21 UJ	21 U	20 U	19 U	1.8 UJ	1.6 U	17 U	20 U	1,700 U	18 UB	18 U	19 U	19 U	18 U
2-Hexanone	- -	- -	µg/kg	20 U	24 U	19 U	18 U	2,000 U	15 U	29 UJ	20 UJ	19 U	19 U	21 U	21 U	20 U	19 U	2.5 UJ	2.2 U	17 U	20 U	1,700 U	18 U	18 U	19 U	19 U	18 U
4-Methyl-2-pentanone	- -	- -	µg/kg	20 U	24 U	19 U	18 U	2,000 U	15 U	29 UJ	20 UJ	19 U	19 U	21 UJ	21 U	20 U	19 U	1.7 UJ	1.4 U	17 U	20 U	1,700 U	18 U	18 U	19 U	19 U	18 U
Acetone	50	500,000	µg/kg	**35**	**8.4 J**	22 UB	18 U	2,000 U	15 U	29 UJ	**40 J**	**14 J**	**28**	21 U	**6.4 J**	20 UB	19 UB	**13 J**	**21 J**	17 U	20 UB	1,700 U	18 UB	18 U	19 UB	19 U	18 UB
Benzene	60	44,000	µg/kg	**2,300 D**	**0.72 J**	3.8 U	3.7 U	**100 J**	**2.0 J**	5.9 UJ	4.1 UJ	**48**	**6,000 D**	**0.39 J**	4.1 U	4.0 U	3.8 U	**1.5 J**	0.22 U	3.4 U	3.9 U	350 U	**2.4 J**	3.6 U	3.7 U	**1.2 J**	**1.8 J**
Bromodichloromethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.68 U	0.59 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Bromoform	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 UJ	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 UJ	4.1 U	4.0 U	3.8 U	2.5 UJ	2.2 U	3.4 U	3.9 U	350 UJ	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Bromomethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.45 U	0.40 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Carbon Disulfide	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	2.5 UJ	2.2 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Carbon Tetrachloride	760	22,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.49 U	0.43 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Chlorobenzene	1,100	500,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.67 UJ	0.58 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Chloroethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 UJ	3.7 UJ	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 UJ	3.8 U	1.1 U	0.99 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Chloroform	370	350,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.31 U	0.27 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Chloromethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 UJ	3.7 UJ	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 UJ	3.8 U	0.30 U	0.27 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
cis-1,2-Dichloroethene	250	500,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.64 UJ	0.56 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
cis-1,3-Dichloropropene	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.73 UJ	0.63 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Cyclohexane	- -	- -	µg/kg	**2.5 J**	4.9 U	3.8 U	3.7 U	**1,500 J**	**23**	5.9 UJ	4.1 UJ	**2.4 J**	**3.3 J**	4.2 U	**2.5 J**	4.0 U	3.8 U	0.71 U	0.62 U	3.4 U	**2.7 J**	**5,000 J**	**2,300 D**	3.6 U	**2.4 J**	3.8 U	3.6 U
Dibromochloromethane	- -	- -	µg/kg	4.0 UJ	4.9 UJ	3.8 U	3.7 U	410 UJ	3.1 UJ	5.9 UJ	4.1 UJ	3.8 UJ	3.7 UJ	4.2 UJ	4.1 UJ	4.0 U	3.8 UJ	0.64 UJ	0.56 U	3.4 UJ	3.9 UJ	350 UJ	3.7 UJ	3.6 UJ	3.7 UJ	3.8 UJ	3.6 UJ
Dichlorodifluoromethane	- -	- -	µg/kg	4.0 UJ	4.9 UJ	3.8 U	3.7 U	410 UJ	3.1 UJ	5.9 UJ	4.1 UJ	3.8 UJ	3.7 UJ	4.2 UJ	4.1 UJ	4.0 U	3.8 UJ	0.42 U	0.36 U	3.4 UJ	3.9 UJ	350 U	3.7 UJ	3.6 UJ	3.7 UJ	3.8 UJ	3.6 UJ
Ethylbenzene	1,000	390,000	µg/kg	**92**	4.9 U	3.8 U	3.7 U	**2,500 J**	**1.5 J**	5.9 UJ	4.1 UJ	**47**	**5,900 D**	**0.33 J**	4.1 U	4.0 U	**0.91 J**	0.35 UJ	0.30 U	3.4 U	3.9 U	**370**	**37**	3.6 U	3.7 U	3.8 U	**0.57 J**
Isopropylbenzene	- -	- -	µg/kg	**19**	4.9 U	3.8 U	3.7 U	**320 J**	3.1 U	5.9 UJ	4.1 UJ	**4.0**	**14**	4.2 U	4.1 U	4.0 U	3.8 U	0.76 U	0.66 U	3.4 U	3.9 U	**370**	**22**	3.6 U	3.7 U	3.8 U	3.6 U
Methyl acetate	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	3.0 U	2.7 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Methyl tert-butyl ether	930	500,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	**7.9**	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	**0.70 J**	4.0 U	3.8 U	0.49 U	0.43 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Methylcyclohexane	- -	- -	µg/kg	**3.1 J**	4.9 U	**0.91 J**	3.7 U	**4,900 J**	**25**	5.9 UJ	4.1 UJ	**3.1 J**	**4.6**	4.2 U	**2.6 J**	4.0 U	**2.4 J**	0.77 U	0.67 U	3.4 U	**2.7 J**	**17,000**	**7,600 D**	**2.3 J**	**2.5 J**	3.8 U	3.6 U
Methylene Chloride	50	500,000	µg/kg	4.0 U	4.9 U	3.8 UJ	3.7 UJ	410 UJ	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 UJ	3.8 U	2.3 U	2.0 U	3.4 U	3.9 U	750 UBJ	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Styrene	- -	- -	µg/kg	**63**	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	**14**	4.2 U	4.1 U	4.0 U	3.8 U	**0.28 J**	0.22 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	**0.70 J**	3.6 U
Tetrachloroethene	1,300	150,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.68 U	**0.70 J**	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U

Table 3
Soil Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Sample Depth(Feet BGS): / Date Collected:	Unrestricted Use SCOs	Restricted Use SCOs Commercial	Units	MW-1 5 - 7 08/11/15	MW-1 9 - 11 08/11/15	MW-2 5 - 7 08/12/15	MW-2 9 - 13 08/12/15	MW-3 7 - 9 08/13/15	MW-3 9 - 10.2 08/13/15	MW-4 5 - 7 08/10/15	MW-4 13 - 14.5 08/10/15	MW-5 10 - 12 08/11/15	MW-5 12 - 14 08/11/15	MW-6 9 - 11 08/12/15	MW-6 13 - 14.2 08/12/15	MW-7 4 - 6 08/12/15	MW-7 6 - 8.3 08/12/15	MW-8 4 - 6 10/08/17	MW-8 13 - 14 10/08/17	SB-1 7 - 9 08/13/15	SB-1 9 - 11 08/13/15	SB-2 7 - 9 08/13/15	SB-2 9 - 11 08/13/15	SB-3 7 - 9 08/13/15	SB-3 9 - 11 08/13/15	SB-5 9 - 11 08/14/15	SB-5 11 - 13.5 08/14/15
Toluene	700	500,000	µg/kg	**6,100 D**	**1.4 J**	**0.52 J**	3.7 U	410 U	**0.25 J**	5.9 UJ	4.1 UJ	**5.9**	**59**	4.2 U	**0.43 J**	4.0 U	3.8 U	**1.8 J**	0.33 U	3.4 U	3.9 U	350 U	**10**	3.6 U	3.7 U	**2.6 J**	3.6 U
trans-1,2-Dichloroethene	190	500,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.52 UJ	0.45 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
trans-1,3-Dichloropropene	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	2.2 UJ	1.9 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Trichloroethene	470	200,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	1.1 UJ	0.97 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Trichlorofluoromethane	- -	- -	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.48 U	0.42 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Vinyl Chloride	20	13,000	µg/kg	4.0 U	4.9 U	3.8 U	3.7 U	410 U	3.1 U	5.9 UJ	4.1 UJ	3.8 U	3.7 U	4.2 U	4.1 U	4.0 U	3.8 U	0.61 U	0.54 U	3.4 U	3.9 U	350 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
Xylenes (total)	260	500,000	µg/kg	**950**	**1.6 J**	**1.2 J**	7.4 U	**14,000 J**	**5.6 J**	12 UJ	8.1 UJ	**170**	**480**	8.4 U	8.2 U	**1.0 J**	**6.4 J**	**0.85 J**	0.74 U	6.8 U	7.9 U	**1,100**	**67**	7.1 U	7.5 U	**3.5 J**	7.2 U
Total BTEX	- -	- -	µg/kg	**9,442**	**3.7 J**	**1.7 J**	BDL	**16,600 J**	**9.4 J**	BDL	BDL	**271**	**12,439**	**0.72 J**	**0.43 J**	**1.0 J**	**7.3 J**	**4.2 J**	BDL	BDL	BDL	**1,470**	**116 J**	BDL	BDL	**7.3 J**	**2.4 J**
Total Volatile Organic Compounds (VOCs)	- -	- -	µg/kg	**9,565 J**	**12.1 J**	**2.63 J**	**0.32 J**	**23,320 J**	**66.5 J**	BDL	**40 J**	**294 J**	**12,503 J**	**0.72 J**	**12.6 J**	**1.0 J**	**9.71 J**	**17.4 J**	**23.1 J**	BDL	**5.4 J**	**23,840 J**	**10,038 J**	**2.3 J**	**4.9 J**	**8.0 J**	**2.37 J**
Semivolatile Organic Compounds																											
2,4,5-Trichlorophenol	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	5,400 UJ	280 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2,4,6-Trichlorophenol	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	4,000 UJ	200 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2,4-Dichlorophenol	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,100 UJ	110 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2,4-Dimethylphenol	- -	- -	µg/kg	**5,300**	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	4,800 UJ	250 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2,4-Dinitrophenol	- -	- -	µg/kg	37,000 U	1,900 U	9,000 U	18,000 U	35,000 U	35,000 U	20,000 U	1,900 U	19,000 U	18,000 U	1,700 U	8,700 U	9,500 U	91,000 U	93,000 UJ	4,700 U	20,000 U	39,000 U	18,000 U	34,000 U	7,200 U	87,000 U	200,000 UJ	39,000 U
2,4-Dinitrotoluene	- -	- -	µg/kg	3,800 U	200 UJ	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 UJ	1,800 U	180 U	890 U	980 U	9,300 U	4,100 UJ	210 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2,6-Dinitrotoluene	- -	- -	µg/kg	3,800 UJ	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 UJ	200 UJ	1,900 U	1,800 UJ	180 UJ	890 UJ	980 U	9,300 U	2,400 UJ	120 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2-Chloronaphthalene	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	3,300 UJ	170 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2-Chlorophenol	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	3,700 UJ	190 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2-Methylnaphthalene	- -	- -	µg/kg	**60,000**	200 U	920 U	1,800 U	**1,200 J**	3,600 U	2,100 U	200 U	**5,300**	**1,700 J**	180 U	890 U	980 U	9,300 U	4,000 UJ	**220 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2-Methylphenol	330	500,000	µg/kg	**3,600 J**	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,400 UJ	120 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
2-Nitroaniline	- -	- -	µg/kg	7,400 U	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	3,000 UJ	150 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
2-Nitrophenol	- -	- -	µg/kg	3,800 UJ	200 UJ	920 U	1,800 U	3,600 U	3,600 U	2,100 UJ	200 UJ	1,900 UJ	1,800 UJ	180 UJ	890 UJ	980 U	9,300 U	5,700 UJ	290 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
3,3'-Dichlorobenzidine	- -	- -	µg/kg	7,400 U	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	24,000 UJ	1,200 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
3-Nitroaniline	- -	- -	µg/kg	7,400 U	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	5,500 UJ	280 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
4,6-Dinitro-2-methylphenol	- -	- -	µg/kg	7,400 U	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	20,000 UJ	1,000 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
4-Bromophenyl-phenylether	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,800 UJ	140 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
4-Chloro-3-Methylphenol	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	5,000 UJ	250 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
4-Chloroaniline	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	5,000 UJ	250 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
4-Chlorophenyl-phenylether	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,500 UJ	130 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
4-Methylphenol	330	500,000	µg/kg	**5,900 J**	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	2,400 UJ	120 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
4-Nitroaniline	- -	- -	µg/kg	7,400 U	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	11,000 UJ	530 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
4-Nitrophenol	- -	- -	µg/kg	7,400 U	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	14,000 UJ	710 U	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
Acenaphthene	20,000	500,000	µg/kg	**9,700**	200 U	920 U	1,800 U	3,600 U	3,600 U	**770 J**	200 U	**2,600**	**840 J**	180 U	890 U	980 U	9,300 U	**3,800 J**	**290 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Acenaphthylene	100,000	500,000	µg/kg	**11,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**910 J**	200 U	**12,000**	**3,500**	180 U	890 U	980 U	9,300 U	**17,000 J**	**1,000**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**8,600 J**	4,000 U
Acetophenone	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,700 UJ	140 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Anthracene	100,000	500,000	µg/kg	**33,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**3,600**	200 U	**20,000**	**6,400**	180 U	890 U	980 U	9,300 U	**40,000 J**	**1,800**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**18,000 J**	4,000 U
Atrazine	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	7,000 UJ	350 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Benzaldehyde	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	16,000 UJ	810 UJ	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Benzo(a)anthracene	1,000	5,600	µg/kg	**30,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**14,000**	**70.0 J**	**20,000**	**11,000**	180 U	890 U	980 U	9,300 U	**87,000 J**	**2,100**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**36,000 J**	**800 J**
Benzo(a)pyrene	1,000	1,000	µg/kg	**20,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**16,000**	**120 J**	**15,000**	**7,400**	180 U	890 U	980 U	9,300 U	**69,000 J**	**1,500**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**30,000 J**	**740 J**
Benzo(b)fluoranthene	1,000	5,600	µg/kg	**22,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**18,000**	**160 J**	**17,000**	**8,400**	180 U	890 U	980 U	9,300 U	**83,000 J**	**1,600**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**32,000 J**	4,000 U

Table 3
Soil Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Sample Depth(Feet BGS): / Date Collected:	Unrestricted Use SCOs	Restricted Use SCOs Commercial	Units	MW-1 5 - 7 08/11/15	MW-1 9 - 11 08/11/15	MW-2 5 - 7 08/12/15	MW-2 9 - 13 08/12/15	MW-3 7 - 9 08/13/15	MW-3 9 - 10.2 08/13/15	MW-4 5 - 7 08/10/15	MW-4 13 - 14.5 08/10/15	MW-5 10 - 12 08/11/15	MW-5 12 - 14 08/11/15	MW-6 9 - 11 08/12/15	MW-6 13 - 14.2 08/12/15	MW-7 4 - 6 08/12/15	MW-7 6 - 8.3 08/12/15	MW-8 4 - 6 10/08/17	MW-8 13 - 14 10/08/17	SB-1 7 - 9 08/13/15	SB-1 9 - 11 08/13/15	SB-2 7 - 9 08/13/15	SB-2 9 - 11 08/13/15	SB-3 7 - 9 08/13/15	SB-3 9 - 11 08/13/15	SB-5 9 - 11 08/14/15	SB-5 11 - 13.5 08/14/15
Benzo(g,h,i)perylene	100,000	500,000	µg/kg	**9,100**	200 U	920 U	1,800 U	3,600 U	3,600 U	**11,000**	**70.0 J**	**7,200**	**3,400**	180 U	890 U	980 U	9,300 U	**38,000 J**	**720 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**16,000 J**	4,000 U
Benzo(k)fluoranthene	800	56,000	µg/kg	**9,200**	200 U	920 U	1,800 U	3,600 U	3,600 U	**8,700**	200 U	**7,800**	**4,900**	180 U	890 U	980 U	9,300 U	**34,000 J**	**700 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**25,000 J**	4,000 U
Biphenyl	- -	- -	µg/kg	**9,400**	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	**3,200**	**970 J**	180 U	890 U	980 U	9,300 U	3,000 UJ	150 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
bis(2-Chloroethoxy)methane	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	4,200 UJ	220 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
bis(2-Chloroethyl)ether	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,600 UJ	130 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
bis(2-Chloroisopropyl)ether	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	4,000 UJ	200 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
bis(2-Ethylhexyl)phthalate	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	**130 J**	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	6,800 UJ	350 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Butylbenzylphthalate	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	3,300 UJ	170 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Caprolactam	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	6,000 UJ	310 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Carbazole	- -	- -	µg/kg	**9,500**	200 U	920 U	1,800 U	3,600 U	3,600 U	**1,200 J**	200 U	**4,300**	**1,100 J**	180 U	890 U	980 U	9,300 U	2,400 UJ	**250 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**2,500 J**	4,000 U
Chrysene	1,000	56,000	µg/kg	**23,000**	**84.0 J**	920 U	1,800 U	3,600 U	3,600 U	**12,000**	**87.0 J**	**15,000**	**7,800**	180 U	890 U	980 U	9,300 U	**70,000 J**	**1,500**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**45,000 J**	**1,200 J**
Dibenzo(a,h)anthracene	330	560	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	**94.0 J**	**3,000**	**2,000**	180 U	890 U	980 U	9,300 U	3,500 UJ	180 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**5,000 J**	4,000 U
Dibenzofuran	7,000	350,000	µg/kg	**28,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**650 J**	200 U	**13,000**	**3,600**	180 U	890 U	980 U	9,300 U	**9,100 J**	**950 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**4,400 J**	4,000 U
Diethylphthalate	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,600 UJ	130 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Dimethylphthalate	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,400 UJ	120 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Di-n-Butylphthalate	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	3,400 UJ	170 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Di-n-Octylphthalate	- -	- -	µg/kg	3,800 UJ	200 UJ	920 U	1,800 U	3,600 U	3,600 U	2,100 UJ	200 UJ	1,900 UJ	1,800 UJ	180 UJ	890 UJ	980 U	9,300 U	2,400 UJ	120 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Fluoranthene	100,000	500,000	µg/kg	**58,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**18,000**	**93.0 J**	**39,000**	**20,000**	180 U	890 U	980 U	9,300 U	**170,000 J**	**4,200 J**	**340 J**	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**82,000 J**	**1,800 J**
Fluorene	30,000	500,000	µg/kg	**35,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**1,100 J**	200 U	**18,000**	**5,300**	180 U	890 U	980 U	9,300 U	**18,000 J**	**1,600**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**8,800 J**	4,000 U
Hexachlorobenzene	330	6,000	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,700 UJ	140 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Hexachlorobutadiene	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	3,000 UJ	150 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Hexachlorocyclopentadiene	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,700 UJ	140 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Hexachloroethane	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,600 UJ	130 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Indeno(1,2,3-cd)pyrene	500	5,600	µg/kg	**9,200**	200 U	920 U	1,800 U	3,600 U	3,600 U	**11,000**	**100 J**	**7,400**	**4,000**	180 U	890 U	980 U	9,300 U	**36,000 J**	**790 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**15,000 J**	4,000 U
Isophorone	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	4,200 UJ	220 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Naphthalene	12,000	500,000	µg/kg	**160,000 D**	200 U	920 U	1,800 U	**940 J**	3,600 U	**600 J**	200 U	**27,000**	**9,600**	180 U	890 U	980 U	9,300 U	2,600 UJ	130 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Nitrobenzene	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	2,200 UJ	110 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
N-Nitroso-di-n-propylamine	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	3,400 UJ	170 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
N-Nitrosodiphenylamine	- -	- -	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	16,000 UJ	830 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Pentachlorophenol	800	6,700	µg/kg	7,400 U	390 U	1,800 U	3,600 U	7,000 U	7,000 U	4,000 U	380 U	3,700 U	3,500 U	350 U	1,700 U	1,900 U	18,000 U	20,000 UJ	1,000 UJ	4,000 U	7,700 U	3,600 U	6,800 U	1,400 U	17,000 U	41,000 UJ	7,800 U
Phenanthrene	100,000	500,000	µg/kg	**140,000 D**	200 U	920 U	1,800 U	3,600 U	3,600 U	**9,400**	**47.0 J**	**44,000**	**16,000**	180 U	890 U	980 U	9,300 U	**110,000 J**	**5,000 J**	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**59,000 J**	**1,700 J**
Phenol	330	500,000	µg/kg	3,800 U	200 U	920 U	1,800 U	3,600 U	3,600 U	2,100 U	200 U	1,900 U	1,800 U	180 U	890 U	980 U	9,300 U	3,100 UJ	160 U	2,100 U	4,000 U	1,800 U	3,500 U	740 U	8,900 U	21,000 UJ	4,000 U
Pyrene	100,000	500,000	µg/kg	**51,000**	200 U	920 U	1,800 U	3,600 U	3,600 U	**16,000**	**83.0 J**	**30,000**	**15,000**	180 U	890 U	980 U	9,300 U	**130,000 J**	**3,300 J**	**280 J**	4,000 U	1,800 U	3,500 U	740 U	8,900 U	**71,000 J**	**1,300 J**
Total Polycyclic Aromatic Hydrocarbons (PAHs)	- -	- -	µg/kg	**620,200**	**84.0 J**	BDL	BDL	**940 J**	BDL	**141,080 J**	**924 J**	**285,000**	**125,540**	BDL	BDL	BDL	BDL	**818,800 J**	**24,000 J**	**620 J**	BDL	BDL	BDL	BDL	BDL	**451,400 J**	**7,540 J**
Total Semivolatile Organic Compounds (SVOCs)	- -	- -	µg/kg	**741,900 J**	**84.0 J**	BDL	BDL	**2,140 J**	BDL	**142,930 J**	**1,054 J**	**310,800**	**132,910 J**	BDL	BDL	BDL	BDL	**914,900 J**	**27,300 J**	**620 J**	BDL	BDL	BDL	BDL	BDL	**458,300 J**	**7,540 J**
Petroleum Hydrocarbons																											
Diesel, Fuel Oil #2, C10-C23	- -	- -	mg/kg	NA	NA	NA	NA	**150**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fuel Oil #4	- -	- -	mg/kg	NA	NA	NA	NA	18.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fuel Oil #6	- -	- -	mg/kg	NA	NA	NA	NA	18.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gasoline	- -	- -	mg/kg	NA	NA	NA	NA	**210**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kerosene	- -	- -	mg/kg	NA	NA	NA	NA	**140**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Motor Oils	- -	- -	mg/kg	NA	NA	NA	NA	**160**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3
Soil Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Sample Depth(Feet BGS): / Date Collected:	Unrestricted Use SCOs	Restricted Use SCOs Commercial	Units	MW-1 5 - 7 08/11/15	MW-1 9 - 11 08/11/15	MW-2 5 - 7 08/12/15	MW-2 9 - 13 08/12/15	MW-3 7 - 9 08/13/15	MW-3 9 - 10.2 08/13/15	MW-4 5 - 7 08/10/15	MW-4 13 - 14.5 08/10/15	MW-5 10 - 12 08/11/15	MW-5 12 - 14 08/11/15	MW-6 9 - 11 08/12/15	MW-6 13 - 14.2 08/12/15	MW-7 4 - 6 08/12/15	MW-7 6 - 8.3 08/12/15	MW-8 4 - 6 10/08/17	MW-8 13 - 14 10/08/17	SB-1 7 - 9 08/13/15	SB-1 9 - 11 08/13/15	SB-2 7 - 9 08/13/15	SB-2 9 - 11 08/13/15	SB-3 7 - 9 08/13/15	SB-3 9 - 11 08/13/15	SB-5 9 - 11 08/14/15	SB-5 11 - 13.5 08/14/15
Unknown Hydrocarbon1	- -	- -	mg/kg	NA	NA	NA	NA	18.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics																											
Aluminum	- -	- -	mg/kg	**16,600 J**	**17,100 J**	**11,200 J**	**16,700 J**	**10,400 J**	**12,700 J**	**9,860 J**	**17,800 J**	**16,400 J**	**15,300 J**	**15,100 J**	**17,900 J**	**20,300 J**	**15,700 J**	**15,400**	**15,100**	**12,600**	**15,500**	**11,200**	**12,800**	**14,400**	**14,100**	**17,300**	**18,600**
Antimony	- -	- -	mg/kg	17.8 UJ	17.5 UJ	16.6 UJ	16.3 UJ	15.8 UJ	15.1 UJ	18.7 UJ	16.7 UJ	**0.990 J**	16.8 UJ	15.6 UJ	15.9 UJ	16.6 UJ	16.8 UJ	0.470 UJ	0.470 UJ	19.0 U	17.5 U	**0.650 J**	16.0 U	16.2 U	15.7 U	18.6 U	18.0 U
Arsenic	13	16	mg/kg	**2.20 J**	**2.90**	**3.60**	**4.00**	**3.60**	**3.60**	**23.9**	**6.60**	**3.90**	**4.80**	**2.80**	**3.50**	**2.40**	**5.60**	**18.5**	**2.30 J**	**7.30**	**3.40**	**3.70**	**4.00**	**4.10**	**3.80**	**5.00**	**3.60**
Barium	350	400	mg/kg	**66.3 J**	**86.4 J**	**55.3 J**	**67.7 J**	**44.3 J**	**47.2 J**	**95.3 J**	**63.9 J**	**168 J**	**69.5 J**	**98.9 J**	**58.8 J**	**75.1 J**	**57.8 J**	**184**	**45.9**	**92.7**	**54.9**	**48.3**	**99.5**	**71.1**	**63.6**	**123**	**76.6**
Beryllium	7.2	590	mg/kg	**0.820**	**0.830**	**0.550**	**0.820**	**0.490**	**0.640**	**0.900**	**0.950**	**0.820**	**0.750**	**0.760**	**0.920**	**0.880**	**0.740**	**0.960**	**0.890**	**0.580**	**0.790**	**0.590**	**0.690**	**0.750**	**0.750**	**0.860**	**0.960**
Cadmium	2.5	9.3	mg/kg	**0.0370 J**	**0.0410 J**	**0.0940 J**	**0.0340 J**	**0.140 J**	**0.0720 J**	**0.290**	**0.130 J**	**0.0530 J**	**0.260**	**0.0560 J**	0.210 U	**0.0740 J**	**0.160 J**	**1.10**	0.0350 U	**0.150 J**	**0.0640 J**	**0.0610 J**	0.210 U	0.220 U	**0.0360 J**	**0.610**	**0.0570 J**
Calcium	- -	- -	mg/kg	**56,600 J**	**45,300 J**	**72,200 J**	**53,400 J**	**54,500 J**	**59,200 J**	**49,500 J**	**12,900 J**	**40,000 J**	**35,000 J**	**45,300 J**	**22,600 J**	**37,500 J**	**46,500 J**	**26,100**	**16,800**	**24,000**	**37,900**	**60,400**	**71,300**	**56,300**	**47,600**	**8,180**	**11,400**
Chromium	- -	- -	mg/kg	**24.7 J**	**26.1 J**	**16.8 J**	**24.3 J**	**15.1 J**	**19.2 J**	**15.7 J**	**26.6 J**	**24.8 J**	**22.9 J**	**22.9 J**	**27.2 J**	**26.4 J**	**24.3 J**	**31.3 J**	**21.8 J**	**16.8**	**25.3**	**17.5**	**20.2**	**22.4**	**22.3**	**23.9**	**28.8**
Cobalt	- -	- -	mg/kg	**13.5**	**13.7**	**10.4**	**15.4**	**10.8**	**12.5**	**6.50**	**15.4**	**14.9**	**14.5**	**13.4**	**14.7**	**8.70**	**10.7**	**13.1 J**	**8.90 J**	**8.60**	**15.1**	**10.8**	**12.2**	**14.2**	**15.5**	**12.2**	**17.1**
Copper	50	270	mg/kg	**27.8**	**28.0**	**27.7 J**	**30.5 J**	**32.1 J**	**28.0 J**	**49.0**	**42.2**	**26.6**	**31.0**	**27.0**	**28.3**	**17.3 J**	**34.1 J**	**60.5 J**	**26.2 J**	**27.4**	**27.1**	**26.5**	**29.1**	**29.2**	**28.0**	**18.4**	**27.0**
Cyanide	27	27	mg/kg	1.10 U	**0.860 J**	1.10 U	**1.10**	1.00 U	1.10 U	**5.80**	1.10 U	**2.90**	**3.80**	1.00 U	1.00 U	1.10 U	1.10 U	NA	NA	1.20 U	1.20 U	1.10 U	1.00 U	1.10 U	1.00 U	**469**	1.20 U
Iron	- -	- -	mg/kg	**20,200 J**	**23,800 J**	**16,500 J**	**21,400 J**	**15,500 J**	**18,300 J**	**11,000 J**	**27,100 J**	**23,800 J**	**24,300 J**	**21,300 J**	**24,100 J**	**19,300 J**	**21,100 J**	**25,000 J**	**17,900 J**	**17,100**	**24,500**	**17,100**	**19,700**	**21,400**	**21,700**	**23,300**	**27,300**
Lead	63	1,000	mg/kg	**10.1**	**10.1**	**12.2**	**12.2**	**12.2**	**13.8**	**138**	**22.3**	**10.9**	**14.3**	**9.70**	**11.8**	**9.10**	**13.2**	**679 J**	**8.80 J**	**130**	**13.4**	**12.2**	**13.4**	**12.1**	**11.4**	**63.6**	**13.5**
Magnesium	- -	- -	mg/kg	**7,830 J**	**8,340 J**	**17,200 J**	**7,380 J**	**12,700 J**	**9,390 J**	**3,640 J**	**6,780 J**	**7,800 J**	**7,460 J**	**7,400 J**	**9,170 J**	**7,770 J**	**6,450 J**	**5,870 J**	**5,420 J**	**6,110**	**8,300**	**11,100**	**7,240**	**7,540**	**7,570**	**5,550**	**7,880**
Manganese	1,600	10,000	mg/kg	**345 J**	**333 J**	**321 J**	**410 J**	**368 J**	**345 J**	**197 J**	**285 J**	**302 J**	**284 J**	**295 J**	**269 J**	**254 J**	**249 J**	**308 J**	**173 J**	**332**	**355**	**349**	**388**	**361**	**360**	**389**	**307**
Mercury	0.18	2.8	mg/kg	**0.0230**	**0.0140 J**	**0.0190**	**0.0180 J**	**0.00890 J**	**0.0170 J**	**0.200**	**0.0320**	**0.0300**	**0.0200**	**0.0170 J**	**0.0150 J**	**0.0570**	**0.0260**	**0.350**	**0.0130 J**	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	30	310	mg/kg	**43.3**	**44.5**	**34.0**	**42.2**	**32.4**	**38.9**	**20.8**	**54.2**	**42.1**	**41.0**	**40.4**	**42.9**	**36.7**	**46.8**	**39.1 J**	**33.3 J**	**24.8**	**45.4**	**34.2**	**39.1**	**42.9**	**41.6**	**35.7**	**48.0**
Potassium	- -	- -	mg/kg	**3,650 J**	**3,470 J**	**2,750 J**	**3,850 J**	**2,700 J**	**3,070 J**	**1,450 J**	**3,840 J**	**3,550 J**	**3,030 J**	**3,110 J**	**3,980 J**	**4,200 J**	**3,520 J**	**4,310 J**	**4,350 J**	**2,720**	**3,000**	**2,510**	**2,990**	**3,020**	**3,010**	**2,960**	**3,120**
Selenium	3.9	1,500	mg/kg	4.70 U	4.70 U	4.40 U	**0.500 J**	4.20 U	4.00 U	**0.560 J**	4.50 U	**1.00 J**	4.50 U	4.10 U	**0.460 J**	**0.780 J**	**2.10 J**	**4.00 J**	**0.470 J**	**0.580 J**	4.70 U	**1.00 J**	**0.440 J**	4.30 U	**0.650 J**	**0.730 J**	4.80 U
Silver	2	1,500	mg/kg	0.710 U	0.700 U	0.660 U	0.650 U	0.630 U	0.600 U	0.750 U	0.670 U	0.710 U	0.670 U	0.620 U	0.630 U	0.660 U	0.670 U	**0.260 J**	0.240 U	0.760 U	0.700 U	0.630 U	0.640 U	0.650 U	0.630 U	0.740 U	0.720 U
Sodium	- -	- -	mg/kg	**226**	**212**	**524**	**235**	**173**	**234**	**736**	**173**	**523**	**472**	**427**	**240**	**186**	**189**	**565**	**411**	**916**	**627**	**407**	**264**	**642**	**327**	**752**	**321**
Thallium	- -	- -	mg/kg	7.10 U	7.00 U	6.60 U	6.50 U	6.30 U	6.00 U	7.50 U	6.70 U	7.10 U	6.70 U	6.20 U	6.30 U	6.60 U	6.70 U	0.350 U	0.350 U	7.60 U	7.00 U	6.30 U	6.40 U	6.50 U	6.30 U	7.40 U	7.20 U
Vanadium	- -	- -	mg/kg	**21.6 J**	**20.9 J**	**17.7 J**	**21.8 J**	**17.6 J**	**19.1 J**	**21.9 J**	**24.7 J**	**20.8 J**	**18.7 J**	**19.2 J**	**22.7 J**	**26.7 J**	**25.7 J**	**29.1 J**	**22.5 J**	**21.8**	**19.7**	**16.9**	**17.1**	**18.6**	**17.7**	**27.6**	**23.9**
Zinc	109	10,000	mg/kg	**56.1 J**	**71.7 J**	**57.7 J**	**56.2 J**	**66.2 J**	**50.8 J**	**135 J**	**90.5 J**	**69.9 J**	**203 J**	**75.4 J**	**52.2 J**	**64.7 J**	**82.1 J**	**482 J**	**35.9 J**	**99.9**	**76.0**	**52.4**	**50.8**	**50.8**	**63.5**	**887**	**79.0**

Notes:

1. Samples were submitted to Test America, Amherst, New York for analysis using USEPA SW-846 Methods 8260B (VOCs), 8270D (SVOCs), 6010C (Inorganics), 9012B (Total Cyanide), 310.13 (Hydrocarbon Identification).
2. Samples from monitoring wells MW-3 and MW-4 were submitted to Test America, Amherst, New York for additional analysis of carbon dioxide, methane, sulfide, nitrate, nitrite, and dissolved iron and manganese.
3. Results are presented in units of micrograms per liter (µg/L) and milligrams per liter (mg/L), as identified.
4. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
5. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
6. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
7. D - Compound quantitated using a secondary dilution.
8. NA - not analyzed
9. BRL - Below reporting limits.
10. BGS - Below ground surface.
11. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
12. Gray Shading indicates the result exceeds NYSDEC Part 375 Soil Cleanup Objectives (SCO) for Unrestricted use (Unrestricted use SCO).
13. Yellow Shading indicates the result exceeds NYSDEC Part 375 Soil Cleanup Objectives (SCO) for Commercial use (Commercial use SCO).
14. - - Indicates a standard or guidance value does not exist for the respective analyte.

Table 4

Shallowest Exceedance of Unrestricted Use SCOs

(feet below ground surface)

Site Management Plan

Park Street Former MGP Site

Location ID	BTEX	PAHs
MW-1	5' - 7'	5' - 7'
MW-2	-	-
MW-3	7' - 9'	-
MW-4	-	5' - 7'
MW-5	-	10' - 12'
MW-6	-	-
MW-7	-	-
MW-8	-	4' - 6'
SB-1	-	-
SB-2	7' - 9'	-
SB-3	-	-
SB-5	-	9' - 11'

- = indicates no exceedance identified

5' - 7' - depth interval of soil sample that contains exceedance

Table 5
Groundwater Analytical Results (Detected Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	NYSDEC TOGS GW Stds & GVs	Units	MW-1 08/31/15	MW-2 08/31/15	MW-3 08/31/15	MW-4 08/31/15	MW-6 08/31/15	MW-7 08/31/15
Volatile Organic Compounds								
2-Butanone	50	µg/L	10 U	10 UJ	10 U	**2.2 J**	10 U	10 U
Acetone	50	µg/L	10 U	10 UJ	10 U	**7.4 J**	12 UB	10 UB
Benzene	1	µg/L	**1.1**	1.0 UJ	1.0 U	**2.0**	**5.8**	**4.2**
Bromodichloromethane	50	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	**1.3 J**	1.0 U
Chloroform	7	µg/L	1.0 U	1.0 UJ	**0.71 J**	**1.4**	**6.6**	**2.4**
cis-1,2-Dichloroethene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	**1.1**
Cyclohexane	- -	µg/L	**18**	**3.8 J**	**0.91 J**	**41**	**43**	**58**
Ethylbenzene	5	µg/L	**0.81 J**	1.0 UJ	1.0 U	**5.9**	**4.4**	**6.2**
Isopropylbenzene	5	µg/L	1.0 U	1.0 UJ	1.0 U	**1.1**	**0.97 J**	**1.4**
Methylcyclohexane	- -	µg/L	**15**	**5.6 J**	**1.6**	**32**	**31**	**54**
Toluene	5	µg/L	**1.4**	**0.65 J**	1.0 U	**4.4**	**3.7**	**4.9**
Xylenes (total)	5	µg/L	**4.2**	**1.5 J**	2.0 U	**29**	**16**	**30**
Total BTEX	- -	µg/L	**7.5**	**2.2**	BRL	**41**	**30**	**45**
Total Volatile Organic Compounds (VOCs)	- -	µg/L	**40.5 J**	**11.6 J**	**3.22 J**	**126 J**	**113 J**	**162**
Semivolatile Organic Compounds								
2,4-Dimethylphenol	50 (GV)	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	**0.860 J**	4.80 U
2-Methylnaphthalene	- -	µg/L	4.60 U	5.20 UJ	4.90 U	**0.790 J**	4.80 U	**1.60 J**
Acetophenone	- -	µg/L	4.60 U	5.20 UJ	4.90 U	**0.570 J**	4.80 U	4.80 U
Caprolactam	- -	µg/L	4.60 U	**29.0 J**	**23.0**	5.00 U	4.80 U	4.80 U
Carbazole	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	**0.380 J**	4.80 U
Naphthalene	10 (GV)	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	**1.20 J**
Total Polycyclic Aromatic Hydrocarbons (PAHs)	- -	µg/L	BRL	BRL	BRL	BRL	BRL	**1.20 J**
Total Semivolatile Organic Compounds (SVOCs)	- -	µg/L	BRL	**29.0 J**	**23.0**	**1.36 J**	**1.24 J**	**2.8 J**
Inorganics								
Aluminum	- -	mg/L	**2.00**	**0.480**	**1.20**	**0.0680 J**	**0.200**	**0.530**
Arsenic	0.025	mg/L	0.0150 U	0.0150 U	0.0150 U	**0.00560 J**	0.0150 U	0.0150 U
Barium	1	mg/L	**0.470**	**2.60**	**2.00**	**0.920**	**0.900**	**0.710**
Calcium	- -	mg/L	**293**	**142**	**158**	**124**	**110**	**121**
Chromium	0.05	mg/L	**0.00320 J**	**0.00150 J**	**0.00220 J**	0.00400 U	0.00400 U	**0.00130 J**
Cobalt	- -	mg/L	0.00400 U	0.00400 U	0.00400 U	0.00400 U	**0.000980 J**	0.00400 U
Copper	0.2	mg/L	**0.00360 J**	0.0100 U	0.0100 U	0.0100 U	**0.00410 J**	**0.00280 J**
Iron	0.3	mg/L	**2.00**	**2.40**	**4.70**	**37.7**	**0.440**	**1.80**
Magnesium	35	mg/L	**204**	**91.2**	**126**	**85.0**	**83.3**	**74.3**
Manganese	0.3	mg/L	**0.150**	**0.0450**	**0.0650**	**0.230**	**0.0300**	**0.0640**
Nickel	0.1	mg/L	**0.00500 J**	0.0100 U	**0.00220 J**	**0.00230 J**	**0.0130**	**0.00200 J**
Potassium	- -	mg/L	**8.40**	**7.40**	**11.7**	**10.4**	**9.30**	**31.1**
Sodium	20	mg/L	**373**	**278**	**159**	**419**	**304**	**377**
Vanadium	- -	mg/L	**0.00390 J**	0.00500 U	**0.00190 J**	0.00500 U	0.00500 U	0.00500 U
Zinc	2	mg/L	**0.00830 J**	**0.00360 J**	**0.00550 J**	**0.00350 J**	**0.00300 J**	**0.00490 J**

Table 5
Groundwater Analytical Results (Detected Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	NYSDEC TOGS GW Stds & GVs	Units	MW-1 08/31/15	MW-2 08/31/15	MW-3 08/31/15	MW-4 08/31/15	MW-6 08/31/15	MW-7 08/31/15
Petroleum Hydrocarbons								
Diesel, Fuel Oil #2, C10-C23	- -	mg/L	R	0.480 U	0.480 U	0.520 U	0.510 U	0.470 U
Fuel Oil #4,#5,#6	- -	mg/L	NA	0.480 U	0.480 U	0.520 U	0.510 U	0.470 U
Gasoline	- -	mg/L	R	0.190 U	0.190 U	**0.360**	0.200 U	**0.410**
Kerosene	- -	mg/L	R	0.480 U	0.480 U	0.520 U	0.510 U	0.470 U
Motor Oils	- -	mg/L	R	0.960 U	0.960 U	1.00 U	1.00 U	0.950 U
Unknown Hydrocarbons	- -	mg/L	R	0.190 U	0.190 U	0.210 U	**0.370**	0.190 U
Geochemical Analyses								
Carbon Dioxide	- -	ug/L	NA	NA	**16,000 J**	**24,000 J**	NA	NA
Methane	- -	ug/L	NA	NA	**5,100 J**	**6,000 J**	NA	NA
Nitrate Nitrogen	0.01	mg/L	NA	NA	0.0500 U	0.0500 U	NA	NA
Sulfide	0.00005	mg/L	NA	NA	1.00 U	1.00 U	NA	NA
Iron (Filtered)	0.3	mg/L	NA	NA	**0.0260 J**	0.0500 U	NA	NA
Manganese (Filtered)	0.3	mg/L	NA	NA	**0.0600**	**0.220**	NA	NA

Notes:

1. Samples were submitted to Test America, Amherst, New York for analysis using USEPA SW-846 Methods 8260B (VOCs), 8270D (SVOCs), 6010C (Inorganics), 9012B (Total Cyanide), 310.13 (Hydrocarbon Identification).
2. Samples from monitoring wells MW-3 and MW-4 were submitted to Test America, Amherst, New York for additional analysis of carbon dioxide, methane, sulfide, nitrate, nitrite, and dissolved iron and manganese.
3. Results are presented in units of micrograms per liter (µg/L) and milligrams per liter (mg/L), as identified.
4. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
5. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
6. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
7. R - Indicates the sample results were rejected.
8. NA - not analyzed
9. BRL - Below method detection limits.
10. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
11. Shading indicates that the result exceeds the NYSDEC TOGS 1.1.1 Water Quality Standard or Guidance Value.
12. - - Indicates a standard or guidance value does not exist for the respective analyte.
13 GV - Guidance Value

Table 6
Groundwater Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	NYSDEC TOGS GW Stds & GVs	Units	MW-1 08/31/15	MW-2 08/31/15	MW-3 08/31/15	MW-4 08/31/15	MW-6 08/31/15	MW-7 08/31/15
Volatile Organic Compounds								
1,1,1-Trichloroethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	0.04	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	3	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	3	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	3	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	50	µg/L	10 U	10 UJ	10 U	**2.2 J**	10 U	10 U
2-Hexanone	50	µg/L	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone	- -	µg/L	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	50	µg/L	10 U	10 UJ	10 U	**7.4 J**	12 UB	10 UB
Benzene	1	µg/L	**1.1**	1.0 UJ	1.0 U	**2.0**	**5.8**	**4.2**
Bromodichloromethane	50	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	**1.3 J**	1.0 U
Bromoform	50	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon Disulfide	60	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	µg/L	1.0 U	1.0 UJ	**0.71 J**	**1.4**	**6.6**	**2.4**
Chloromethane	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	**1.1**
cis-1,3-Dichloropropene	0.4	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	- -	µg/L	**18**	**3.8 J**	**0.91 J**	**41**	**43**	**58**
Dibromochloromethane	50	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	5	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	µg/L	**0.81 J**	1.0 UJ	1.0 U	**5.9**	**4.4**	**6.2**
Isopropylbenzene	5	µg/L	1.0 U	1.0 UJ	1.0 U	**1.1**	**0.97 J**	**1.4**
Methyl acetate	- -	µg/L	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
Methyl tert-butyl ether	10	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Methylcyclohexane	- -	µg/L	**15**	**5.6 J**	**1.6**	**32**	**31**	**54**
Methylene Chloride	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	µg/L	**1.4**	**0.65 J**	1.0 U	**4.4**	**3.7**	**4.9**
trans-1,2-Dichloroethene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U

Table 6
Groundwater Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	NYSDEC TOGS GW Stds & GVs	Units	MW-1 08/31/15	MW-2 08/31/15	MW-3 08/31/15	MW-4 08/31/15	MW-6 08/31/15	MW-7 08/31/15
Trichloroethene	5	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	5	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	µg/L	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	µg/L	**4.2**	**1.5 J**	2.0 U	**29**	**16**	**30**
Total BTEX	- -	µg/L	**7.5**	**2.2**	BDL	**41**	**30**	**45**
Total Volatile Organic Compounds (VOCs)	- -	µg/L	**40.5 J**	**11.6 J**	**3.22 J**	**126 J**	**113 J**	**162**
Semivolatile Organic Compounds								
2,4,5-Trichlorophenol	1	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
2,4,6-Trichlorophenol	1	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
2,4-Dichlorophenol	5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
2,4-Dimethylphenol	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	**0.860 J**	4.80 U
2,4-Dinitrophenol	10	µg/L	9.20 UJ	10.0 UJ	9.80 UJ	10.0 UJ	9.70 UJ	9.50 UJ
2,4-Dinitrotoluene	5	µg/L	4.60 UJ	5.20 UJ	4.90 UJ	5.00 UJ	4.80 UJ	4.80 UJ
2,6-Dinitrotoluene	5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
2-Chloronaphthalene	10	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
2-Chlorophenol	1	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
2-Methylnaphthalene	- -	µg/L	4.60 U	5.20 UJ	4.90 U	**0.790 J**	4.80 U	**1.60 J**
2-Methylphenol	1	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
2-Nitroaniline	5	µg/L	9.20 U	10.0 UJ	9.80 U	10.0 U	9.70 U	9.50 U
2-Nitrophenol	1	µg/L	4.60 UJ	5.20 UJ	4.90 UJ	5.00 UJ	4.80 UJ	4.80 UJ
3,3'-Dichlorobenzidine	5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
3-Nitroaniline	5	µg/L	9.20 U	10.0 UJ	9.80 U	10.0 U	9.70 U	9.50 U
4,6-Dinitro-2-methylphenol	1	µg/L	9.20 U	10.0 UJ	9.80 U	10.0 U	9.70 U	9.50 U
4-Bromophenyl-phenylether	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
4-Chloro-3-Methylphenol	1	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
4-Chloroaniline	5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
4-Chlorophenyl-phenylether	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
4-Methylphenol	1	µg/L	9.20 U	10.0 UJ	9.80 U	10.0 U	9.70 U	9.50 U
4-Nitroaniline	5	µg/L	9.20 U	10.0 UJ	9.80 U	10.0 U	9.70 U	9.50 U
4-Nitrophenol	1	µg/L	9.20 U	10.0 U	9.80 U	10.0 U	9.70 UJ	9.50 UJ
Acenaphthene	20	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Acenaphthylene	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Acetophenone	- -	µg/L	4.60 U	5.20 UJ	4.90 U	**0.570 J**	4.80 U	4.80 U
Anthracene	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Atrazine	- -	µg/L	4.60 UJ	5.20 UJ	4.90 UJ	5.00 UJ	4.80 UJ	4.80 UJ
Benzaldehyde	- -	µg/L	4.60 UJ	5.20 UBJ	4.90 UBJ	5.00 UJ	4.80 UJ	4.80 UJ
Benzo(a)anthracene	0.002	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Benzo(a)pyrene	0	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Benzo(b)fluoranthene	0.002	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Benzo(g,h,i)perylene	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Benzo(k)fluoranthene	0.002	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Biphenyl	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
bis(2-Chloroethoxy)methane	5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
bis(2-Chloroethyl)ether	1	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
bis(2-Chloroisopropyl)ether	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U

Table 6
Groundwater Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	NYSDEC TOGS GW Stds & GVs	Units	MW-1 08/31/15	MW-2 08/31/15	MW-3 08/31/15	MW-4 08/31/15	MW-6 08/31/15	MW-7 08/31/15
bis(2-Ethylhexyl)phthalate	5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Butylbenzylphthalate	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Caprolactam	- -	µg/L	4.60 U	**29.0 J**	**23.0**	5.00 U	4.80 U	4.80 U
Carbazole	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	**0.380 J**	4.80 U
Chrysene	0.002	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Dibenzo(a,h)anthracene	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Dibenzofuran	- -	µg/L	9.20 U	10.0 UJ	9.80 U	10.0 U	9.70 U	9.50 U
Diethylphthalate	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Dimethylphthalate	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Di-n-Butylphthalate	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Di-n-Octylphthalate	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Fluoranthene	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Fluorene	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Hexachlorobenzene	0.04	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Hexachlorobutadiene	0.5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Hexachlorocyclopentadiene	5	µg/L	4.60 UJ	5.20 UJ	4.90 UJ	5.00 UJ	4.80 UJ	4.80 UJ
Hexachloroethane	5	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Indeno(1,2,3-cd)pyrene	0.002	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Isophorone	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Naphthalene	10	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	**1.20 J**
Nitrobenzene	0.4	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
N-Nitroso-di-n-propylamine	- -	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
N-Nitrosodiphenylamine	50	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Pentachlorophenol	1	µg/L	9.20 UJ	10.0 UJ	9.80 UJ	10.0 UJ	9.70 UJ	9.50 UJ
Phenanthrene	50	µg/L	4.60 UB	5.20 UBJ	4.90 UBJ	5.00 UB	4.80 UB	4.80 UB
Phenol	1	µg/L	4.60 U	5.20 UJ	4.90 U	5.00 U	4.80 U	4.80 U
Pyrene	50	µg/L	4.60 UJ	5.20 UJ	4.90 UJ	5.00 UJ	4.80 UJ	4.80 UJ
Total Polycyclic Aromatic Hydrocarbons (PAHs)	- -	µg/L	BDL	BDL	BDL	BDL	BDL	**1.20 J**
Total Semivolatile Organic Compounds (SVOCs)	- -	µg/L	BDL	**29.0 J**	**23.0**	**1.36 J**	**1.24 J**	**2.8 J**
Inorganics								
Aluminum	- -	mg/L	**2.00**	**0.480**	**1.20**	**0.0680 J**	**0.200**	**0.530**
Antimony	0.003	mg/L	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Arsenic	0.025	mg/L	0.0150 U	0.0150 U	0.0150 U	**0.00560 J**	0.0150 U	0.0150 U
Barium	1	mg/L	**0.470**	**2.60**	**2.00**	**0.920**	**0.900**	**0.710**
Beryllium	0.003	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Cadmium	0.005	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Calcium	- -	mg/L	**293**	**142**	**158**	**124**	**110**	**121**
Chromium	0.05	mg/L	**0.00320 J**	**0.00150 J**	**0.00220 J**	0.00400 U	0.00400 U	**0.00130 J**
Cobalt	- -	mg/L	0.00400 U	0.00400 U	0.00400 U	0.00400 U	**0.000980 J**	0.00400 U
Copper	0.2	mg/L	**0.00360 J**	0.0100 U	0.0100 U	0.0100 U	**0.00410 J**	**0.00280 J**
Cyanide	0.2	mg/L	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Iron	0.3	mg/L	**2.00**	**2.40**	**4.70**	**37.7**	**0.440**	**1.80**
Lead	0.025	mg/L	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Magnesium	35	mg/L	**204**	**91.2**	**126**	**85.0**	**83.3**	**74.3**
Manganese	0.3	mg/L	**0.150**	**0.0450**	**0.0650**	**0.230**	**0.0300**	**0.0640**

Table 6
Groundwater Analytical Results (All Analytes)

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	NYSDEC TOGS GW Stds & GVs	Units	MW-1 08/31/15	MW-2 08/31/15	MW-3 08/31/15	MW-4 08/31/15	MW-6 08/31/15	MW-7 08/31/15
Nickel	0.1	mg/L	**0.00500 J**	0.0100 U	**0.00220 J**	**0.00230 J**	**0.0130**	**0.00200 J**
Potassium	- -	mg/L	**8.40**	**7.40**	**11.7**	**10.4**	**9.30**	**31.1**
Selenium	0.01	mg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U
Silver	0.05	mg/L	0.00600 U	0.00600 U	0.00600 U	0.00600 U	0.00600 U	0.00600 U
Sodium	20	mg/L	**373**	**278**	**159**	**419**	**304**	**377**
Thallium	0.0005	mg/L	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Vanadium	- -	mg/L	**0.00390 J**	0.00500 U	**0.00190 J**	0.00500 U	0.00500 U	0.00500 U
Zinc	2	mg/L	**0.00830 J**	**0.00360 J**	**0.00550 J**	**0.00350 J**	**0.00300 J**	**0.00490 J**
Petroleum Hydrocarbons								
Diesel, Fuel Oil #2, C10-C23	- -	mg/L	R	0.480 U	0.480 U	0.520 U	0.510 U	0.470 U
Fuel Oil #4,#5,#6	- -	mg/L	NA	0.480 U	0.480 U	0.520 U	0.510 U	0.470 U
Gasoline	- -	mg/L	R	0.190 U	0.190 U	**0.360**	0.200 U	**0.410**
Kerosene	- -	mg/L	R	0.480 U	0.480 U	0.520 U	0.510 U	0.470 U
Motor Oils	- -	mg/L	R	0.960 U	0.960 U	1.00 U	1.00 U	0.950 U
Unknown Hydrocarbons	- -	mg/L	R	0.190 U	0.190 U	0.210 U	**0.370**	0.190 U
Geochemical Analyses								
Carbon Dioxide	- -	ug/L	NA	NA	**16,000 J**	**24,000 J**	NA	NA
Methane	- -	ug/L	NA	NA	**5,100 J**	**6,000 J**	NA	NA
Nitrate Nitrogen	0.01	mg/L	NA	NA	0.0500 U	0.0500 U	NA	NA
Sulfide	0.00005	mg/L	NA	NA	1.00 U	1.00 U	NA	NA
Iron (Filtered)	0.3	mg/L	NA	NA	**0.0260 J**	0.0500 U	NA	NA
Manganese (Filtered)	0.3	mg/L	NA	NA	**0.0600**	**0.220**	NA	NA

Notes:

1. Samples were submitted to Test America, Amherst, New York for analysis using USEPA SW-846 Methods 8260B (VOCs), 8270D (SVOCs), 6010C (Inorganics), 9012B (Total Cyanide), 310.13 (Hydrocarbon Identification).
2. Samples from monitoring wells MW-3 and MW-4 were submitted to Test America, Amherst, New York for additional analysis of carbon dioxide, methane, sulfide, nitrate, nitrite, and dissolved iron and manganese.
3. Results are presented in units of micrograms per liter (µg/L) and milligrams per liter (mg/L), as identified.
4. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
5. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
6. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
7. R - Indicates the sample results are rejected.
8. NA - not analyzed
9. BDL - Below method detection limits.
10. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
11. Shading indicates that the result exceeds the NYSDEC TOGS 1.1.1 Water Quality Standard or Guidance Value.
12. - - Indicates a standard or guidance value does not exist for the respective analyate.
13. GV - Guidance value

Table 7
Well Construction Details

Site Management Plan
Park Street Former MGP Site

Well ID	Northing Coordinate	Easting Coordinate	Ground Surface Elevation	Top of Weathered Bedrock (feet bgs)	Top of Weathered Bedrock Elevation	Top of Competant Bedrock (feet bgs)	Top of Competant Bedrock Elevation	Screened Interval (ft bgs)	Measuring Point Elevation	Actual Depth to Bottom (feet TOC)
MW-1	1353704.55	1019330.35	758.42	11.0	747.42	14.5	743.92	16.5-36.5	758.41	35.84
MW-2	1353766.16	1019308.14	760.29	13.0	747.29	15.0	745.29	17-37	760.25	36.65
MW-3	1353780.05	1019260.67	761.65	10.5	751.15	11.0	750.65	13-33	761.66	32.54
MW-4	1353683.74	1019399.01	756.07	14.5	741.57	18.5	737.57	20.5-40.5	756.18	39.70
MW-5	1353666.22	1019333.49	757.63	--	--	17.5	740.13	20-30	757.82	34.90
MW-6	1353655.22	1019280.82	757.55	9.0	748.55	15.0	742.55	17-37	757.73	37.39
MW-7	1353502.95	1019379.85	743.96	8.0	735.96	8.3	735.66	10.5-30.5	744.07	29.28
MW-8	1353641.80	1019404.36	753.50	11.0	742.50	14.5	739.00	16.5-36.5	753.11	38.80

Notes:
1. bgs - feet below ground surface
2. TOC - top of casing
3. Northing and Easting Coordinates in reference to the New York State Plane Coordinate Systemm West Zone, 1983 North American Datum (NAD83)
4. Elevations in feet above mean sea level (ft amsl), 1988 North American Vertical Datum (NAVD88)
5. MW-5 was installed with a 5-foot long PVC sump
6. -- Indicates weathered bedrock was not identified at this location.

Table 8
TO-15 Soil Gas Analytical Results (Detected Analytes Only)

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	Units	SV-1 09/02/15	SV-2 09/02/15	SV-3 09/02/15	SV-4 09/02/15	SV-5 09/02/15	SV-6 09/02/15	SV-7 09/02/15
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/m3	1.1 U	**4.0**	6.6 U	1.1 U	3.3 U	22 U	21 U
1,1,2,2-Tetrachloroethane	µg/m3	**0.60 J**	1.4 U	8.3 U	1.4 U	4.1 U	27 U	27 U
1,1,2-trichloro-1,2,2-trifluoroethane	µg/m3	**0.52 J**	**0.94 J**	9.2 U	**0.70 J**	4.6 U	31 U	30 U
1,2,4-Trimethylbenzene	µg/m3	**4.2**	**1.3**	**48**	**4.6**	**3.5**	20 U	19 U
1,3,5-Trimethylbenzene	µg/m3	**0.99**	**0.54 J**	**20**	**0.59 J**	**0.79 J**	20 U	19 U
2,2,4-Trimethylpentane	µg/m3	**0.29 J**	0.93 U	**2.9 J**	**0.81 J**	2.8 U	19 U	18 U
2-Butanone	µg/m3	**3.5**	**2.4**	**3.2 J**	**3.4**	**7.7**	**6.8 J**	29 U
2-Hexanone	µg/m3	**0.79 J**	2.0 U	12 U	**1.3 J**	6.1 U	41 U	40 U
4-Ethyltoluene	µg/m3	**0.41 J**	0.98 U	**10**	**0.77 J**	**0.88 J**	20 U	19 U
Acetone	µg/m3	**52**	**45**	**58 J**	**47**	**52**	**240**	**43 J**
Benzene	µg/m3	**0.15 J**	**1.6**	**4.1**	**0.24 J**	**0.43 J**	13 U	13 U
Bromodichloromethane	µg/m3	1.3 U	**3.9**	**24**	**24**	**25**	**4.3 J**	26 U
Butane	µg/m3	1.2 U	1.2 U	**240**	**11**	**9.6**	24 U	23 U
Carbon Disulfide	µg/m3	**0.71 J**	**2.2**	**11**	**6.2**	**16**	31 U	31 U
Carbon Tetrachloride	µg/m3	1.3 U	1.3 U	7.6 U	**0.14 J**	**0.37 J**	25 U	25 U
Chlorobenzene	µg/m3	0.92 U	0.92 U	5.5 U	0.92 U	**0.31 J**	18 U	18 U
Chlorodifluoromethane	µg/m3	1.8 U	1.8 U	**1.9 J**	**1.3 J**	**150**	35 U	35 U
Chloroform	µg/m3	**5.1**	**32**	**260**	**140**	**120**	**46**	**44**
Chloromethane	µg/m3	**0.16 J**	**0.68 J**	6.2 U	**0.23 J**	3.1 U	21 U	20 U
Cyclohexane	µg/m3	**0.79**	**5.9**	**49**	**4.2**	**4.1**	14 U	14 U
Dibromochloromethane	µg/m3	1.7 U	1.7 U	**2.0 J**	**2.7**	**3.1 J**	34 U	34 U
Dichlorodifluoromethane	µg/m3	**2.3 J**	**2.9**	**3.6 J**	**2.9**	**2.6 J**	**310**	49 U
Ethylbenzene	µg/m3	**0.43 J**	**0.51 J**	**12**	**3.2**	**2.6 J**	17 U	17 U
Isopentane	µg/m3	0.59 U	**6.5**	**150**	**7.5**	**5.6**	12 U	12 U
Isopropanol	µg/m3	**0.72 J**	12 U	74 U	12 U	**1.2 J**	250 U	240 U
Isopropylbenzene	µg/m3	0.98 U	**0.24 J**	**2.2 J**	**0.30 J**	**0.44 J**	20 U	19 U
m,p-Xylenes	µg/m3	**3.4**	**2.5**	**64**	**8.7**	**9.4**	43 U	43 U
Naphthalene	µg/m3	**0.71 J**	**2.0 J**	**1.4 J**	**1.1 J**	**0.64 J**	52 U	52 U
n-Decane	µg/m3	2.9 U	**1.0 J**	**25**	**2.0 J**	8.7 U	**44 J**	57 U
n-Dodecane	µg/m3	35 U	35 U	210 U	**4.6 J**	100 U	**63 J**	690 U
N-Heptane	µg/m3	0.82 U	**1.9**	**85**	**0.60 J**	**2.2 J**	16 U	16 U
N-Hexane	µg/m3	**0.42 J**	**2.3**	**110**	**4.4**	**5.4**	14 U	**2.5 J**
n-Octane	µg/m3	0.93 U	**1.9**	**50**	**0.67 J**	**1.6 J**	**9.8 J**	**32**
Nonane	µg/m3	1.0 U	**1.1**	**33**	**0.98 J**	**1.1 J**	**22**	**230**
n-Propylbenzene	µg/m3	**0.22 J**	**0.20 J**	**5.7**	**0.48 J**	**0.64 J**	20 U	19 U
n-Undecane	µg/m3	32 U	32 U	**15 J**	**2.7 J**	96 U	**100 J**	630 U
o-Xylene	µg/m3	**1.8**	**1.6**	**20**	**5.0**	**5.0**	17 U	17 U
Pentane	µg/m3	1.5 U	**2.7**	**160**	**8.3**	**8.7**	30 U	29 U
p-Isopropyltoluene	µg/m3	**0.19 J**	**0.32 J**	**1.0 J**	**0.19 J**	**0.48 J**	22 UJ	22 U
Styrene	µg/m3	0.85 U	0.85 U	5.1 U	**0.10 J**	2.5 U	17 U	17 U
t-Butyl Alcohol	µg/m3	**1.7 J**	15 U	91 U	15 U	**1.7 J**	300 U	300 U
Tetrachloroethene	µg/m3	**6.1**	**38**	**2.2 J**	**2.4**	4.1 U	27 U	27 U
Tetrahydrofuran	µg/m3	15 U	15 U	89 U	15 U	**2.9 J**	290 U	290 U
Toluene	µg/m3	**0.69 J**	**3.9**	**24**	**2.2**	**2.6**	**14 J**	**11 J**
Trichlorofluoromethane	µg/m3	**1.5**	**2.7**	**4.0 J**	**1.9**	**4.8**	22 U	22 U
Xylenes (total)	µg/m3	**5.2**	**4.1**	**85**	**13**	**15**	61 U	60 U

Notes:
1. Samples were submitted to Test America, South Burlington, Vermont for analysis using USEPA method TO-15.
2. TO-15 results are presented in units of micrograms per cubic meter ($\mu g/m^3$).
3. J - Indicates the analyte was detected at a concentration less than the practical quantitation limit (PQL). The value reported is an estimated concentration.
4. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
5. UJ - Indicates the constituent was not detected above the PQL. The reported limit is approximate and may or may not represent the actual PQL.
6. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.

Table 9
TO-15 Soil Gas Analytical Results

Site Management Plan
Park Street Former MGP Site

Location ID:		SV-1	SV-2	SV-3	SV-4	SV-5	SV-6	SV-7
Date Collected:	Units	09/02/15	09/02/15	09/02/15	09/02/15	09/02/15	09/02/15	09/02/15
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/m3	1.1 U	**4.0**	6.6 U	1.1 U	3.3 U	22 U	21 U
1,1,2,2-Tetrachloroethane	µg/m3	**0.60 J**	1.4 U	8.3 U	1.4 U	4.1 U	27 U	27 U
1,1,2-trichloro-1,2,2-trifluoroethane	µg/m3	**0.52 J**	**0.94 J**	9.2 U	**0.70 J**	4.6 U	31 U	30 U
1,1,2-Trichloroethane	µg/m3	1.1 U	1.1 U	6.6 U	1.1 U	3.3 U	22 U	21 U
1,1-Dichloroethane	µg/m3	0.81 U	0.81 U	4.9 U	0.81 U	2.4 U	16 U	16 U
1,1-Dichloroethene	µg/m3	0.79 U	0.79 U	4.8 U	0.79 U	2.4 U	16 U	16 U
1,2,4-Trichlorobenzene	µg/m3	3.7 U	3.7 U	22 U	3.7 U	11 U	74 U	73 U
1,2,4-Trimethylbenzene	µg/m3	**4.2**	**1.3**	**48**	**4.6**	**3.5**	20 U	19 U
1,2-Dibromoethane	µg/m3	1.5 U	1.5 U	9.3 U	1.5 U	4.6 U	31 U	30 U
1,2-Dichlorobenzene	µg/m3	1.2 U	1.2 U	7.2 U	1.2 U	3.6 U	24 U	24 U
1,2-Dichloroethane	µg/m3	0.81 U	0.81 U	4.9 U	0.81 U	2.4 U	16 U	16 U
1,2-Dichloroethene (total)	µg/m3	1.6 U	1.6 U	9.5 U	1.6 U	4.7 U	32 U	31 U
1,2-Dichloropropane	µg/m3	0.92 U	0.92 U	5.6 U	0.92 U	2.8 U	18 U	18 U
1,2-Dichlorotetrafluoroethane	µg/m3	1.4 U	1.4 U	8.4 U	1.4 U	4.2 U	28 U	28 U
1,3,5-Trimethylbenzene	µg/m3	**0.99**	**0.54 J**	**20**	**0.59 J**	**0.79 J**	20 U	19 U
1,3-Butadiene	µg/m3	0.44 U	0.44 U	2.7 U	0.44 U	1.3 U	8.8 U	8.7 U
1,3-Dichlorobenzene	µg/m3	1.2 U	1.2 U	7.2 U	1.2 U	3.6 U	24 U	24 U
1,4-Dichlorobenzene	µg/m3	1.2 U	1.2 U	7.2 U	1.2 U	3.6 U	24 U	24 U
1,4-Dioxane	µg/m3	18 U	18 U	110 U	18 U	54 U	360 U	350 U
2,2,4-Trimethylpentane	µg/m3	**0.29 J**	0.93 U	**2.9 J**	**0.81 J**	2.8 U	19 U	18 U
2-Butanone	µg/m3	**3.5**	**2.4**	**3.2 J**	**3.4**	**7.7**	**6.8 J**	29 U
2-Chlorotoluene	µg/m3	1.0 U	1.0 U	6.2 U	1.0 U	3.1 U	21 U	20 U
2-Hexanone	µg/m3	**0.79 J**	2.0 U	12 U	**1.3 J**	6.1 U	41 U	40 U
3-Chloropropene	µg/m3	1.6 U	1.6 U	9.4 U	1.6 U	4.7 U	31 U	31 U
4-Ethyltoluene	µg/m3	**0.41 J**	0.98 U	**10**	**0.77 J**	**0.88 J**	20 U	19 U
4-Methyl-2-pentanone	µg/m3	2.0 U	2.0 U	12 U	2.0 U	6.1 U	41 U	40 U
Acetone	µg/m3	**52**	**45**	**58 J**	**47**	**52**	**240**	**43 J**
Benzene	µg/m3	**0.15 J**	**1.6**	**4.1**	**0.24 J**	**0.43 J**	13 U	13 U
Benzyl Chloride	µg/m3	1.0 U	1.0 U	6.2 U	1.0 U	3.1 U	21 U	20 U
Bromodichloromethane	µg/m3	1.3 U	**3.9**	**24**	**24**	**25**	**4.3 J**	26 U
Bromoethane	µg/m3	0.87 U	0.87 U	5.3 U	0.87 U	2.6 U	17 U	17 U
Bromoform	µg/m3	2.1 U	2.1 U	12 UT	2.1 U	6.2 U	41 U	41 U
Bromomethane	µg/m3	0.78 U	0.78 U	4.7 U	0.78 U	2.3 U	16 U	15 U
Butane	µg/m3	1.2 U	1.2 U	**240**	**11**	**9.6**	24 U	23 U
Carbon Disulfide	µg/m3	**0.71 J**	**2.2**	**11**	**6.2**	**16**	31 U	31 U
Carbon Tetrachloride	µg/m3	1.3 U	1.3 U	7.6 U	**0.14 J**	**0.37 J**	25 U	25 U

Table 9
TO-15 Soil Gas Analytical Results

Site Management Plan
Park Street Former MGP Site

Location ID:		SV-1	SV-2	SV-3	SV-4	SV-5	SV-6	SV-7
Date Collected:	Units	09/02/15	09/02/15	09/02/15	09/02/15	09/02/15	09/02/15	09/02/15
Chlorobenzene	µg/m3	0.92 U	0.92 U	5.5 U	0.92 U	**0.31 J**	18 U	18 U
Chlorodifluoromethane	µg/m3	1.8 U	1.8 U	**1.9 J**	**1.3 J**	**150**	35 U	35 U
Chloroethane	µg/m3	1.3 U	1.3 U	7.9 U	1.3 U	3.9 U	26 U	26 U
Chloroform	µg/m3	**5.1**	**32**	**260**	**140**	**120**	**46**	**44**
Chloromethane	µg/m3	**0.16 J**	**0.68 J**	6.2 U	**0.23 J**	3.1 U	21 U	20 U
cis-1,2-Dichloroethene	µg/m3	0.79 U	0.79 U	4.8 U	0.79 U	2.4 U	16 U	16 U
cis-1,3-Dichloropropene	µg/m3	0.91 U	0.91 U	5.5 U	0.91 U	2.7 U	18 U	18 U
Cyclohexane	µg/m3	**0.79**	**5.9**	**49**	**4.2**	**4.1**	14 U	14 U
Dibromochloromethane	µg/m3	1.7 U	1.7 U	**2.0 J**	**2.7**	**3.1 J**	34 U	34 U
Dichlorodifluoromethane	µg/m3	**2.3 J**	**2.9**	**3.6 J**	**2.9**	**2.6 J**	**310**	49 U
Ethylbenzene	µg/m3	**0.43 J**	**0.51 J**	**12**	**3.2**	**2.6 J**	17 U	17 U
Hexachlorobutadiene	µg/m3	2.1 U	2.1 U	13 U	2.1 U	6.4 U	43 U	42 U
Isopentane	µg/m3	0.59 U	**6.5**	**150**	**7.5**	**5.6**	12 U	12 U
Isopropanol	µg/m3	**0.72 J**	12 U	74 U	12 U	**1.2 J**	250 U	240 U
Isopropylbenzene	µg/m3	0.98 U	**0.24 J**	**2.2 J**	**0.30 J**	**0.44 J**	20 U	19 U
m,p-Xylenes	µg/m3	**3.4**	**2.5**	**64**	**8.7**	**9.4**	43 U	43 U
Methyl Methacrylate	µg/m3	2.0 U	2.0 U	12 U	2.0 U	6.1 U	41 U	40 U
Methyl tert-butyl ether	µg/m3	0.72 U	0.72 U	4.3 U	0.72 U	2.2 U	14 U	14 U
Methylene Chloride	µg/m3	1.7 UB	1.7 UB	10 UB	1.7 UB	5.2 UB	35 UB	34 UB
Naphthalene	µg/m3	**0.71 J**	**2.0 J**	**1.4 J**	**1.1 J**	**0.64 J**	52 U	52 U
n-Butylbenzene	µg/m3	1.1 U	1.1 U	6.6 U	1.1 U	3.3 U	22 U	22 U
n-Decane	µg/m3	2.9 U	**1.0 J**	**25**	**2.0 J**	8.7 U	**44 J**	57 U
n-Dodecane	µg/m3	35 U	35 U	210 U	**4.6 J**	100 U	**63 J**	690 U
N-Heptane	µg/m3	0.82 U	**1.9**	**85**	**0.60 J**	**2.2 J**	16 U	16 U
N-Hexane	µg/m3	**0.42 J**	**2.3**	**110**	**4.4**	**5.4**	14 U	**2.5 J**
n-Octane	µg/m3	0.93 U	**1.9**	**50**	**0.67 J**	**1.6 J**	**9.8 J**	**32**
Nonane	µg/m3	1.0 U	**1.1**	**33**	**0.98 J**	**1.1 J**	**22**	**230**
n-Propylbenzene	µg/m3	**0.22 J**	**0.20 J**	**5.7**	**0.48 J**	**0.64 J**	20 U	19 U
n-Undecane	µg/m3	32 U	32 U	**15 J**	**2.7 J**	96 U	**100 J**	630 U
o-Xylene	µg/m3	**1.8**	**1.6**	**20**	**5.0**	**5.0**	17 U	17 U
Pentane	µg/m3	1.5 U	**2.7**	**160**	**8.3**	**8.7**	30 U	29 U
p-Isopropyltoluene	µg/m3	**0.19 J**	**0.32 J**	**1.0 J**	**0.19 J**	**0.48 J**	22 UJ	22 U
sec-Butylbenzene	µg/m3	1.1 U	1.1 U	6.6 U	1.1 U	3.3 U	22 U	22 U
Styrene	µg/m3	0.85 U	0.85 U	5.1 U	**0.10 J**	2.5 U	17 U	17 U
t-Butyl Alcohol	µg/m3	**1.7 J**	15 U	91 U	15 U	**1.7 J**	300 U	300 U
tert-Butylbenzene	µg/m3	1.1 U	1.1 U	6.6 U	1.1 U	3.3 U	22 U	22 U
Tetrachloroethene	µg/m3	**6.1**	**38**	**2.2 J**	**2.4**	4.1 U	27 U	27 U

Table 9
TO-15 Soil Gas Analytical Results

Site Management Plan
Park Street Former MGP Site

Location ID: / Date Collected:	Units	SV-1 09/02/15	SV-2 09/02/15	SV-3 09/02/15	SV-4 09/02/15	SV-5 09/02/15	SV-6 09/02/15	SV-7 09/02/15
Tetrahydrofuran	µg/m3	15 U	15 U	89 U	15 U	**2.9 J**	290 U	290 U
Toluene	µg/m3	**0.69 J**	**3.9**	**24**	**2.2**	**2.6**	**14 J**	**11 J**
trans-1,2-Dichloroethene	µg/m3	0.79 U	0.79 U	4.8 U	0.79 U	2.4 U	16 U	16 U
trans-1,3-Dichloropropene	µg/m3	0.91 U	0.91 U	5.5 U	0.91 U	2.7 U	18 U	18 U
Trichloroethene	µg/m3	1.1 U	1.1 U	6.5 U	1.1 U	3.2 U	21 U	21 U
Trichlorofluoromethane	µg/m3	**1.5**	**2.7**	**4.0 J**	**1.9**	**4.8**	22 U	22 U
Vinyl Chloride	µg/m3	0.51 U	0.51 U	3.1 U	0.51 U	1.5 U	10 U	10 U
Xylenes (total)	µg/m3	**5.2**	**4.1**	**85**	**13**	**15**	61 U	60 U

Notes:
1. Samples were submitted to Test America, South Burlington, Vermont for analysis using USEPA method TO-15.
2. TO-15 results are presented in units of micrograms per cubic meter ($\mu g/m^3$).
3. J - Indicates the analyte was detected at a concentration less than the practical quantitation limit (PQL). The value reported is an estimated concentration.
4. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
5. UJ - Indicates the constituent was not detected above the PQL. The reported limit is approximate and may or may not represent the actual PQL.
6. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.

Table 10
Inspection and Monitoring Schedule

Site Management Plan
Park Street Former MGP Site

Year	Event	Anticipated Dates[1]	Scheduled Activities			
			Effectiveness Monitoring	NAPL Gauging[2]	O&M	
					Site Inspection	Well Inspections
1	Q1 - Quarterly Monitoring	Jan 2018		X		
	Q2 - Semi-annual Monitoring	April 2018	X	X		
	Q3 - Quarterly Monitoring	July 2018		X		
	Q4 - Annual Monitoring	October 2018	X	X	X	X
2	Q6 - Semi-annual Monitoring	April 2019	X	X		
	Q8 - Annual Monitoring	October 2019	X	X	X	X
3	Q10 - Semi-annual Monitoring	April 2020	X	X		
	Q12 - Annual Monitoring	October 2020	X	X	X	X
4	Q14 - Semi-annual Monitoring	April 2021	X	X		
	Q16 - Annual Monitoring	October 2021	X	X	X	X
5	Q18 - Semi-annual Monitoring	April 2022	X	X		
	Q20 - Annual Monitoring	October 2022	X	X	X	X

Notes:

Effectiveness Monitoring – includes laboratory analysis for BTEX and PAHs on groundwater collected from 7 MWs

NAPL Gauging – includes gauging of depth to water, NAPL, and bottom at MW-5 (NOTE: Table assumes NYSDEC-approval to modify NAPL gauging frequency after 1st year of monitoring)

Site and Well Inspections – includes annual visual inspections of MWs associated with the site and depth to bottom measurements

1 – Dates subject to change based upon NYSDEC approval of SMP

2 – As presented in the SMP text, the NAPL gauging schedule may be modified, in concurrence with the NYSDEC, based on the presence/absence of NAPL

Table 11
Sampling and Analysis Summary

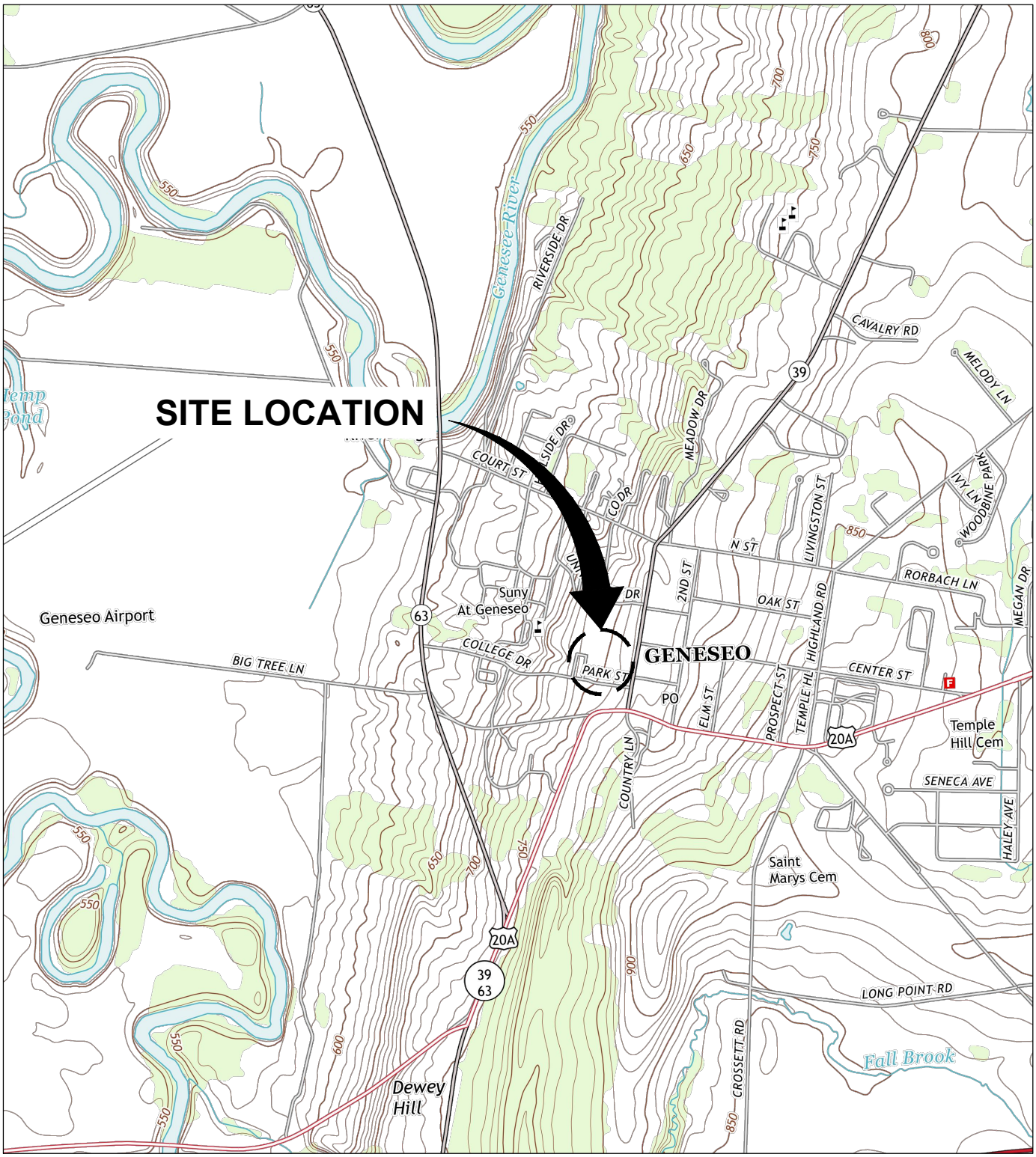
Site Management Plan
Park Street Former MGP Site

Year	Task	Laboratory Analysis[4,5]	Quantity of Samples	Field QA/QC Samples			Laboratory QA/QC Samples		Total
				Trip Blanks[1]	Field Blind Dups[3]	Equip Rinse Blanks[2]	MS/MSD	MSB/LCS	
1	Q2 (Semi-Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
	Q4 (Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
2	Q6 (Semi-Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
	Q8 (Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
3	Q10 (Semi-Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
	Q12 (Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
4	Q14 (Semi-Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
	Q16 (Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
5	Q18 (Semi-Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11
	Q20 (Annual)	BTEX	7	2	1	1	1 / 1	0	13
	Effectiveness Monitoring	PAHs	7	0	1	1	1 / 1	0	11

Notes:

1. One trip blank will be collected per cooler per day of samples for BTEX analysis (assume 2 days).
2. Equipment rinse blanks will be collected at a frequency of 1 per 20 if re-use equipment; not required if use disposable equipment
3. Blind Duplicate will be collected at a frequency of 1 per 20 and sent to the laboratory for analysis
4. BTEX analysis by USEPA SW-846 Method 8260
5. PAH analysis by USEPA SW-846 Method 8270C

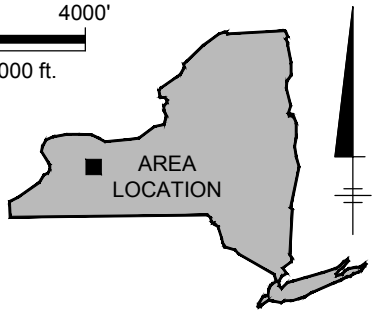
Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., GENESEO, NY, 2013

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



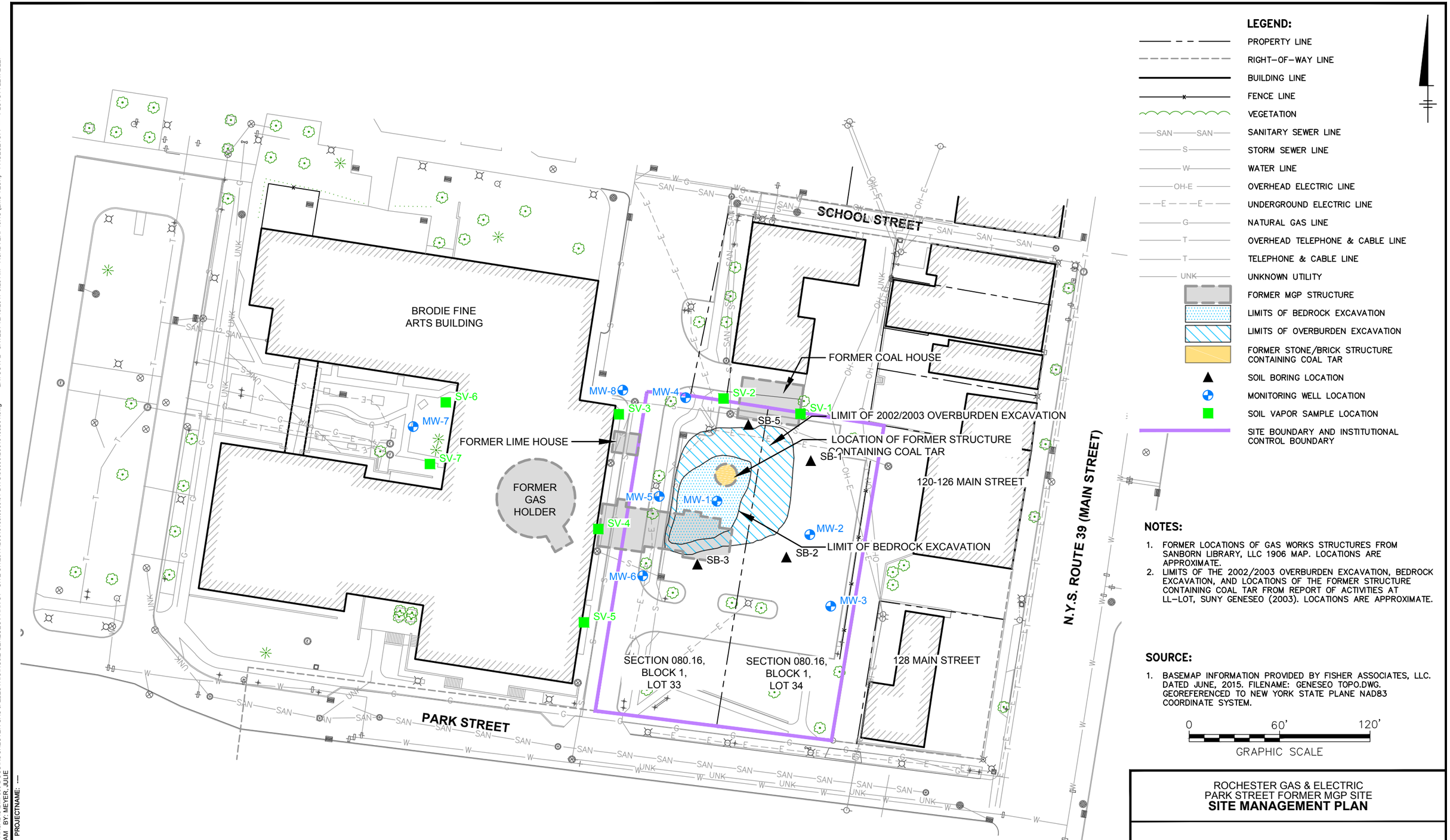
ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:CRANBURY-NJ DIV/GROUP:ENVCAD DB:JMEYER LD:JMEYER PIC:K.WHITE PM:B.AHRENS TM:B.AHRENS LYR:(Opt)ON=*;OFF=*REF*
C:\Users\jmeyer\OneDrive - ARCADIS\BIM 360 DOCS\ROCHESTER GAS & ELECTRIC\RG&E GENESEO\PARK ST - SITE CH\2017\B0013138.0006\01-DWG\00003\B0013138N01.dwg LAYOUT: 1 SAVED: 12/11/2017 2:25 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE:
PLTFULL.CTB PLOTTED: 12/11/2017 2:26 PM BY: MEYER, JULIE
XREFS: IMAGES: PROJECTNAME: ---



LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- BUILDING LINE
- FENCE LINE
- VEGETATION
- SANITARY SEWER LINE
- STORM SEWER LINE
- WATER LINE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- NATURAL GAS LINE
- OVERHEAD TELEPHONE & CABLE LINE
- TELEPHONE & CABLE LINE
- UNKNOWN UTILITY
- FORMER MGP STRUCTURE
- LIMITS OF BEDROCK EXCAVATION
- LIMITS OF OVERBURDEN EXCAVATION
- FORMER STONE/BRICK STRUCTURE CONTAINING COAL TAR
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- SOIL VAPOR SAMPLE LOCATION
- SITE BOUNDARY AND INSTITUTIONAL CONTROL BOUNDARY

NOTES:

1. FORMER LOCATIONS OF GAS WORKS STRUCTURES FROM SANBORN LIBRARY, LLC 1906 MAP. LOCATIONS ARE APPROXIMATE.
2. LIMITS OF THE 2002/2003 OVERBURDEN EXCAVATION, BEDROCK EXCAVATION, AND LOCATIONS OF THE FORMER STRUCTURE CONTAINING COAL TAR FROM REPORT OF ACTIVITIES AT LL-LOT, SUNY GENESEO (2003). LOCATIONS ARE APPROXIMATE.

SOURCE:

1. BASEMAP INFORMATION PROVIDED BY FISHER ASSOCIATES, LLC. DATED JUNE, 2015. FILENAME: GENESEO TOPO.DWG. GEOREFERENCED TO NEW YORK STATE PLANE NAD83 COORDINATE SYSTEM.

0 60' 120'

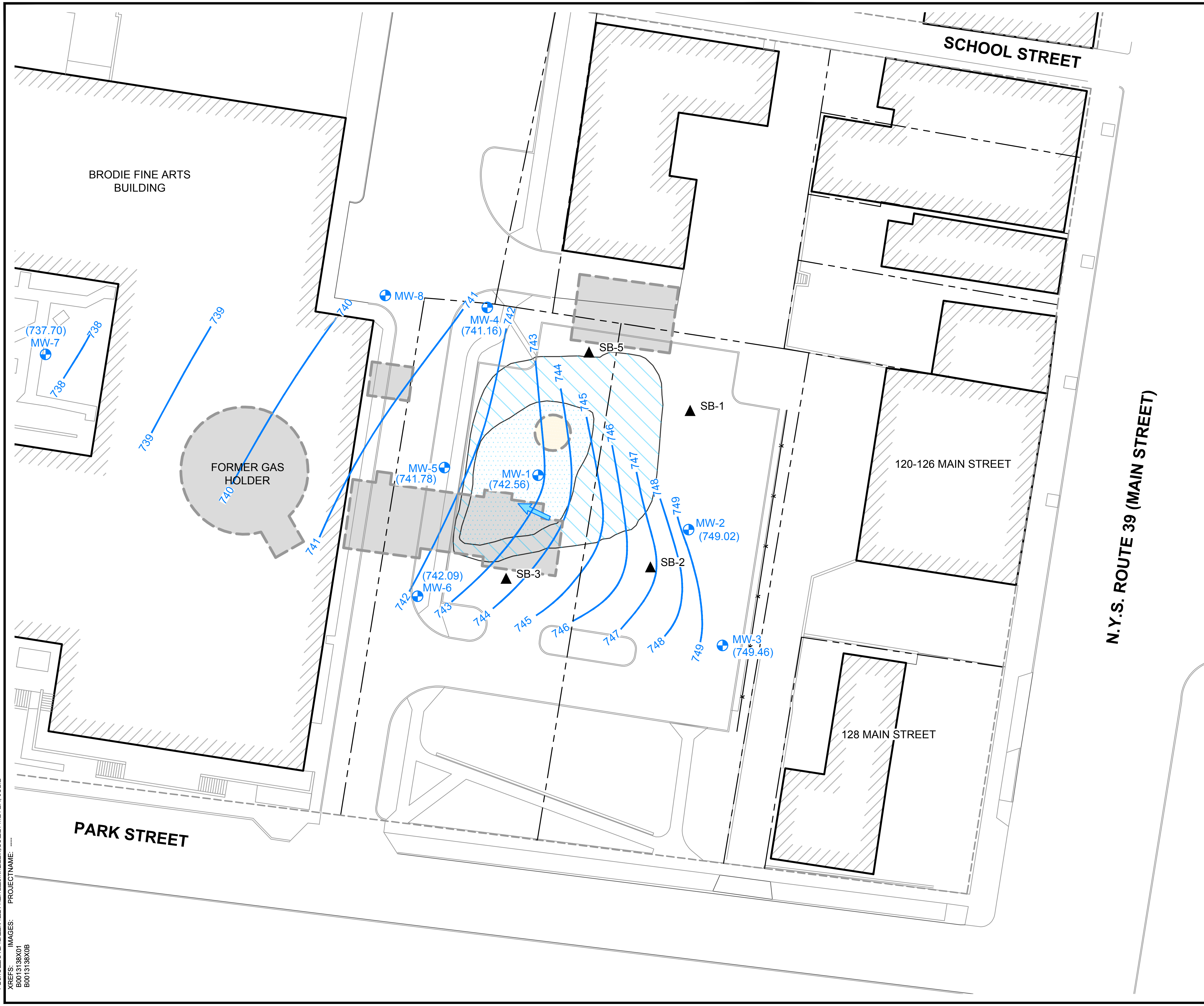
GRAPHIC SCALE

ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

SITE MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE **2**



LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- BUILDING LINE
- FENCE LINE
- FORMER MGP STRUCTURE
- LIMITS OF BEDROCK EXCAVATION
- LIMITS OF OVERBURDEN EXCAVATION
- FORMER STONE/BRICK STRUCTURE CONTAINING COAL TAR
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- INFERRED GROUNDWATER ELEVATION CONTOUR
- (89.79) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL, 1988 NORTH AMERICAN VERTICAL DATUM (NAVD88).
2. FORMER LOCATIONS OF GAS WORKS STRUCTURES FROM SANBORN LIBRARY, LLC 1906 MAP. LOCATIONS ARE APPROXIMATE.
3. LIMITS OF THE 2002/2003 OVERBURDEN EXCAVATION, BEDROCK EXCAVATION, AND LOCATIONS OF THE FORMER STRUCTURE CONTAINING COAL TAR FROM REPORT OF ACTIVITIES AT LL–LOT, SUNY GENESEO (2003). LOCATIONS ARE APPROXIMATE.
4. MONITORING WELL MW–8 WAS INSTALLED SUBSEQUENT TO DATA PRESENTED HEREIN.

SOURCE:

1. BASEMAP INFORMATION PROVIDED BY FISHER ASSOCIATES, LLC. DATED JUNE, 2015. FILENAME: GENESEO TOPO.DWG. GEOREFERENCED TO NEW YORK STATE PLANE NAD83 COORDINATE SYSTEM.

0 40' 80'

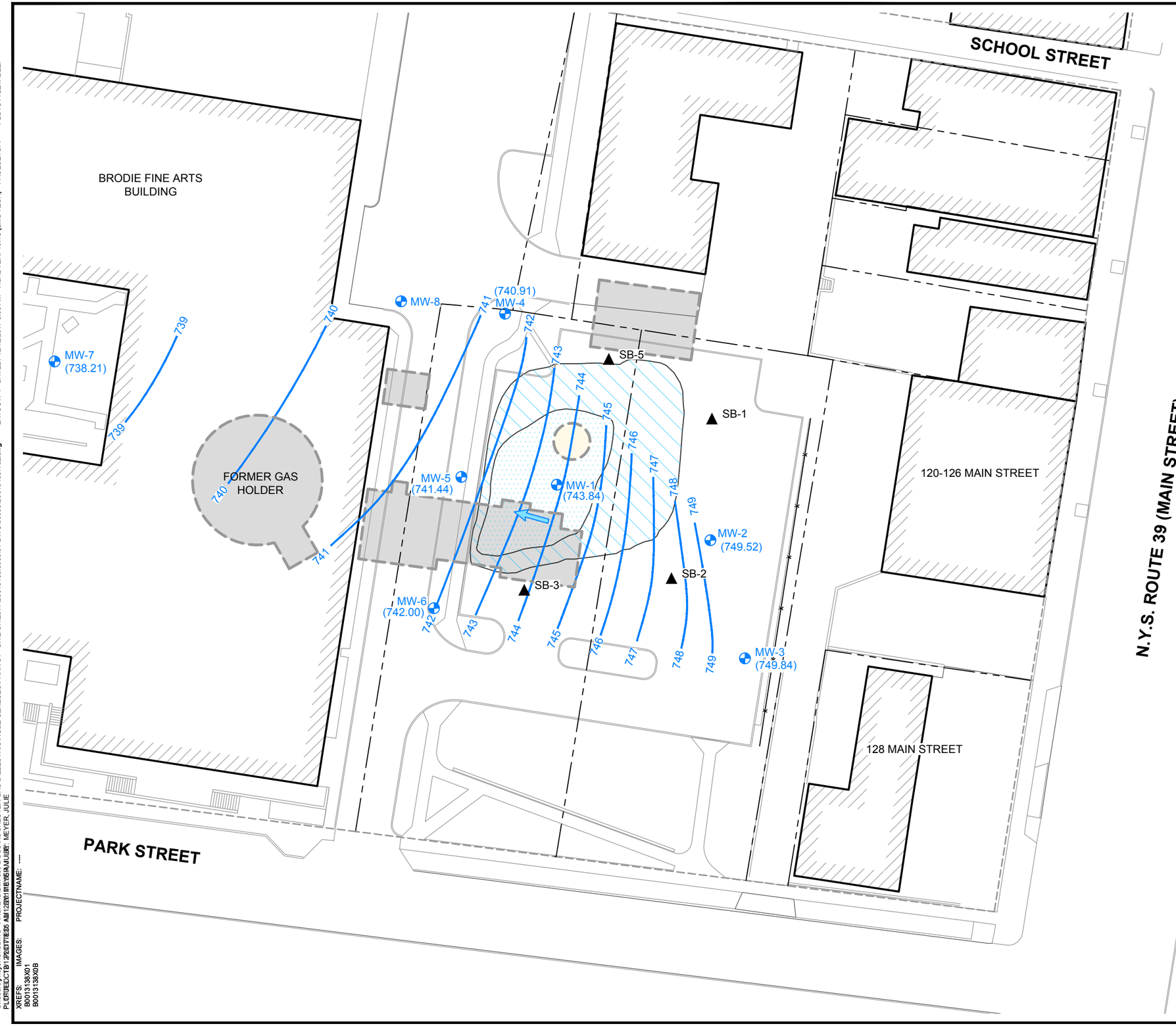
GRAPHIC SCALE

ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

SHALLOW BEDROCK GROUNDWATER CONTOURS AUGUST 31, 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE **3**



LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- BUILDING LINE
- FENCE LINE
- FORMER MGP STRUCTURE
- LIMITS OF BEDROCK EXCAVATION
- LIMITS OF OVERBURDEN EXCAVATION
- FORMER STONE/BRICK STRUCTURE CONTAINING COAL TAR
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- INFERRED GROUNDWATER ELEVATION CONTOUR
- (89.79) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL, 1988 NORTH AMERICAN VERTICAL DATUM (NAVD88).
2. FORMER LOCATIONS OF GAS WORKS STRUCTURES FROM SANBORN LIBRARY, LLC 1906 MAP. LOCATIONS ARE APPROXIMATE.
3. LIMITS OF THE 2002/2003 OVERBURDEN EXCAVATION, BEDROCK EXCAVATION, AND LOCATIONS OF THE FORMER STRUCTURE CONTAINING COAL TAR FROM REPORT OF ACTIVITIES AT LL–LOT, SUNY GENESEO (2003). LOCATIONS ARE APPROXIMATE.
4. MONITORING WELL MW–8 WAS INSTALLED SUBSEQUENT TO DATA PRESENTED HEREIN.

SOURCE:

1. BASEMAP INFORMATION PROVIDED BY FISHER ASSOCIATES, LLC. DATED JUNE, 2015. FILENAME: GENESEO TOPO.DWG. GEOREFERENCED TO NEW YORK STATE PLANE NAD83 COORDINATE SYSTEM.

0 40' 80'

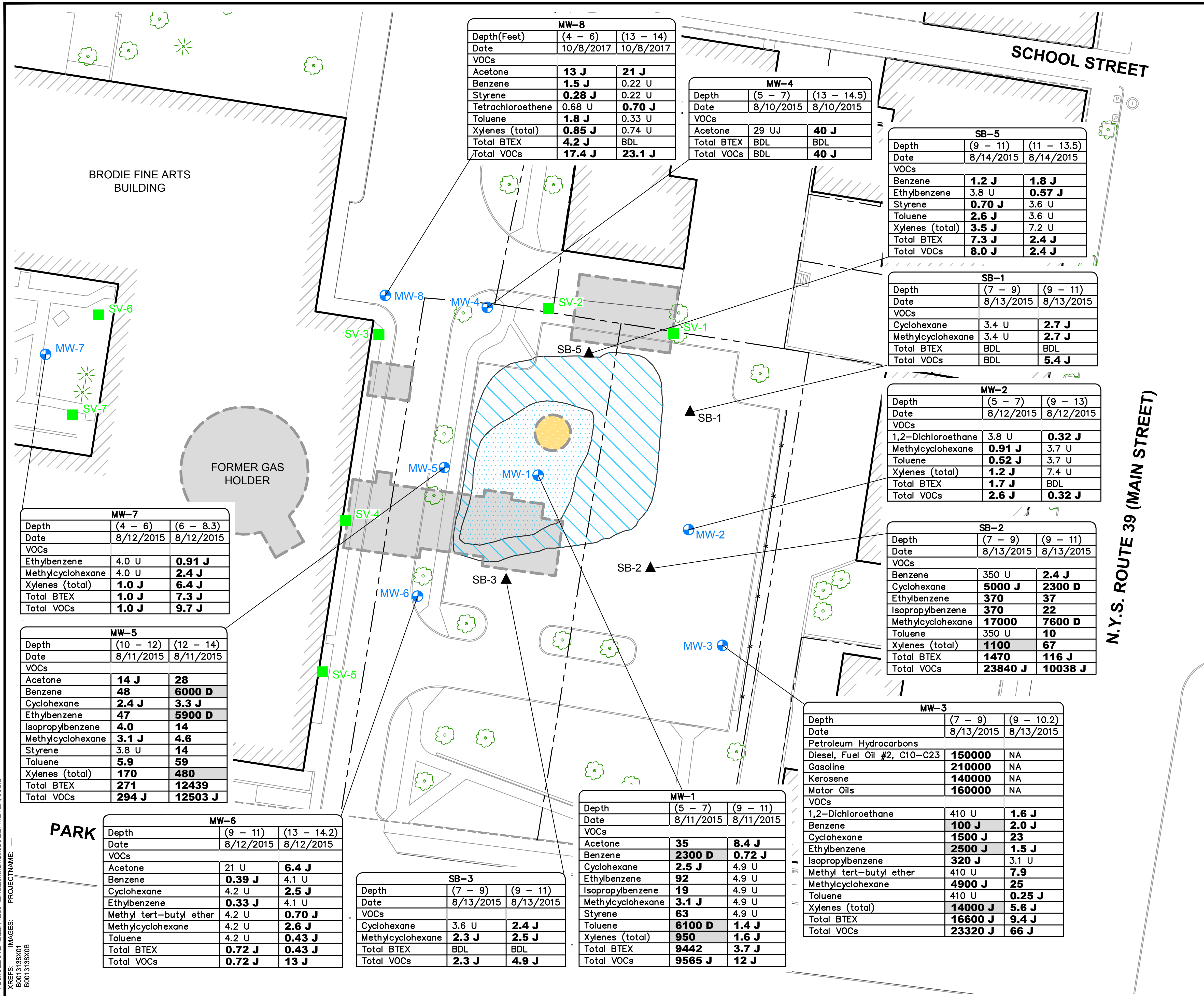
GRAPHIC SCALE

ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

SHALLOW BEDROCK GROUNDWATER CONTOURS OCTOBER 1, 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4



MW-8		
Depth(Feet)	(4 – 6)	(13 – 14)
Date	10/8/2017	10/8/2017
VOCs		
Acetone	**13 J**	**21 J**
Benzene	**1.5 J**	0.22 U
Styrene	**0.28 J**	0.22 U
Tetrachloroethene	0.68 U	**0.70 J**
Toluene	**1.8 J**	0.33 U
Xylenes (total)	**0.85 J**	0.74 U
Total BTEX	**4.2 J**	BDL
Total VOCs	**17.4 J**	**23.1 J**

MW-4		
Depth	(5 – 7)	(13 – 14.5)
Date	8/10/2015	8/10/2015
VOCs		
Acetone	29 UJ	**40 J**
Total BTEX	BDL	BDL
Total VOCs	BDL	**40 J**

SB-5		
Depth	(9 – 11)	(11 – 13.5)
Date	8/14/2015	8/14/2015
VOCs		
Benzene	**1.2 J**	**1.8 J**
Ethylbenzene	3.8 U	**0.57 J**
Styrene	**0.70 J**	3.6 U
Toluene	**2.6 J**	3.6 U
Xylenes (total)	**3.5 J**	7.2 U
Total BTEX	**7.3 J**	**2.4 J**
Total VOCs	**8.0 J**	**2.4 J**

SB-1		
Depth	(7 – 9)	(9 – 11)
Date	8/13/2015	8/13/2015
VOCs		
Cyclohexane	3.4 U	**2.7 J**
Methylcyclohexane	3.4 U	**2.7 J**
Total BTEX	BDL	BDL
Total VOCs	BDL	**5.4 J**

MW-2		
Depth	(5 – 7)	(9 – 13)
Date	8/12/2015	8/12/2015
VOCs		
1,2–Dichloroethane	3.8 U	**0.32 J**
Methylcyclohexane	**0.91 J**	3.7 U
Toluene	**0.52 J**	3.7 U
Xylenes (total)	**1.2 J**	7.4 U
Total BTEX	**1.7 J**	BDL
Total VOCs	**2.6 J**	**0.32 J**

SB-2		
Depth	(7 – 9)	(9 – 11)
Date	8/13/2015	8/13/2015
VOCs		
Benzene	350 U	**2.4 J**
Cyclohexane	**5000 J**	**2300 D**
Ethylbenzene	**370**	**37**
Isopropylbenzene	**370**	**22**
Methylcyclohexane	**17000**	**7600 D**
Toluene	350 U	**10**
Xylenes (total)	**1100**	**67**
Total BTEX	**1470**	**116 J**
Total VOCs	**23840 J**	**10038 J**

MW-7		
Depth	(4 – 6)	(6 – 8.3)
Date	8/12/2015	8/12/2015
VOCs		
Ethylbenzene	4.0 U	**0.91 J**
Methylcyclohexane	4.0 U	**2.4 J**
Xylenes (total)	**1.0 J**	**6.4 J**
Total BTEX	**1.0 J**	**7.3 J**
Total VOCs	**1.0 J**	**9.7 J**

MW-5		
Depth	(10 – 12)	(12 – 14)
Date	8/11/2015	8/11/2015
VOCs		
Acetone	**14 J**	**28**
Benzene	**48**	**6000 D**
Cyclohexane	**2.4 J**	**3.3 J**
Ethylbenzene	**47**	**5900 D**
Isopropylbenzene	**4.0**	**14**
Methylcyclohexane	**3.1 J**	**4.6**
Styrene	3.8 U	**14**
Toluene	**5.9**	**59**
Xylenes (total)	**170**	**480**
Total BTEX	**271**	**12439**
Total VOCs	**294 J**	**12503 J**

MW-3		
Depth	(7 – 9)	(9 – 10.2)
Date	8/13/2015	8/13/2015
Petroleum Hydrocarbons		
Diesel, Fuel Oil #2, C10–C23	**150000**	NA
Gasoline	**210000**	NA
Kerosene	**140000**	NA
Motor Oils	**160000**	NA
VOCs		
1,2–Dichloroethane	410 U	**1.6 J**
Benzene	**100 J**	**2.0 J**
Cyclohexane	**1500 J**	**23**
Ethylbenzene	**2500 J**	**1.5 J**
Isopropylbenzene	**320 J**	3.1 U
Methyl tert–butyl ether	410 U	**7.9**
Methylcyclohexane	**4900 J**	**25**
Toluene	410 U	**0.25 J**
Xylenes (total)	**14000 J**	**5.6 J**
Total BTEX	**16600 J**	**9.4 J**
Total VOCs	**23320 J**	**66 J**

MW-1		
Depth	(5 – 7)	(9 – 11)
Date	8/11/2015	8/11/2015
VOCs		
Acetone	**35**	**8.4 J**
Benzene	**2300 D**	**0.72 J**
Cyclohexane	**2.5 J**	4.9 U
Ethylbenzene	**92**	4.9 U
Isopropylbenzene	**19**	4.9 U
Methylcyclohexane	**3.1 J**	4.9 U
Styrene	**63**	4.9 U
Toluene	**6100 D**	**1.4 J**
Xylenes (total)	**950**	**1.6 J**
Total BTEX	**9442**	**3.7 J**
Total VOCs	**9565 J**	**12 J**

SB-3		
Depth	(7 – 9)	(9 – 11)
Date	8/13/2015	8/13/2015
VOCs		
Cyclohexane	3.6 U	**2.4 J**
Methylcyclohexane	**2.3 J**	**2.5 J**
Total BTEX	BDL	BDL
Total VOCs	**2.3 J**	**4.9 J**

MW-6		
Depth	(9 – 11)	(13 – 14.2)
Date	8/12/2015	8/12/2015
VOCs		
Acetone	21 U	**6.4 J**
Benzene	**0.39 J**	4.1 U
Cyclohexane	4.2 U	**2.5 J**
Ethylbenzene	**0.33 J**	4.1 U
Methyl tert–butyl ether	4.2 U	**0.70 J**
Methylcyclohexane	4.2 U	**2.6 J**
Toluene	4.2 U	**0.43 J**
Total BTEX	**0.72 J**	**0.43 J**
Total VOCs	**0.72 J**	**13 J**

LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- BUILDING LINE
- FENCE LINE
- VEGETATION
- FORMER MGP STRUCTURE
- LIMITS OF BEDROCK EXCAVATION
- LIMITS OF OVERBURDEN EXCAVATION
- FORMER STONE/BRICK STRUCTURE CONTAINING COAL TAR
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- SOIL VAPOR SAMPLE LOCATION

NOTES:

1. RESULTS ARE IN UNITS OF MICROGRAMS PER LITER (ug/L)
2. ONLY DETECTED CONSTITUENTS ARE PRESENTED.
3. BTEX – BENZENE, TOLUENE, ETHYLBENZENE, XYLENE
4. VOC – VOLATILE ORGANIC COMPOUND
5. DEPTHS ARE IN FEET BELOW GROUND SURFACE
6. NA – NOT ANALYZED
7. BDL – BELOW DETECTION LIMITS
8. J – INDICATES AN ESTIMATED CONCENTRATION
9. U – INDICATES THE CONSTITUENT WAS NOT DETECTED ABOVE THE IDENTIFIED CONCENTRATION
10. A BOLD RESULT INDICATES CONSTITUENT DETECTION
11. GRAY SHADING INDICATES RESULT EXCEEDS THE NYSDEC PART 375 UNRESTRICTED USE SCO.
12. YELLOW SHADING INDICATES RESULT EXCEEDS THE NYSDEC PART 375 COMMERCIAL USE SCO.
13. FORMER LOCATIONS OF GAS WORKS STRUCTURES FROM SANBORN LIBRARY, LLC 1906 MAP. LOCATIONS ARE APPROXIMATE.
14. LIMITS OF THE 2002/2003 OVERBURDEN EXCAVATION, BEDROCK EXCAVATION, AND LOCATIONS OF THE FORMER STRUCTURE CONTAINING COAL TAR FROM REPORT OF ACTIVITIES AT LL–LOT, SUNY GENESEO (2003). LOCATIONS ARE APPROXIMATE.

SOURCE:

1. BASEMAP INFORMATION PROVIDED BY FISHER ASSOCIATES, LLC. DATED JUNE, 2015. FILENAME: GENESEO TOPO.DWG. GEOREFERENCED TO NEW YORK STATE PLANE NAD83 COORDINATE SYSTEM.

0 40' 80'

GRAPHIC SCALE

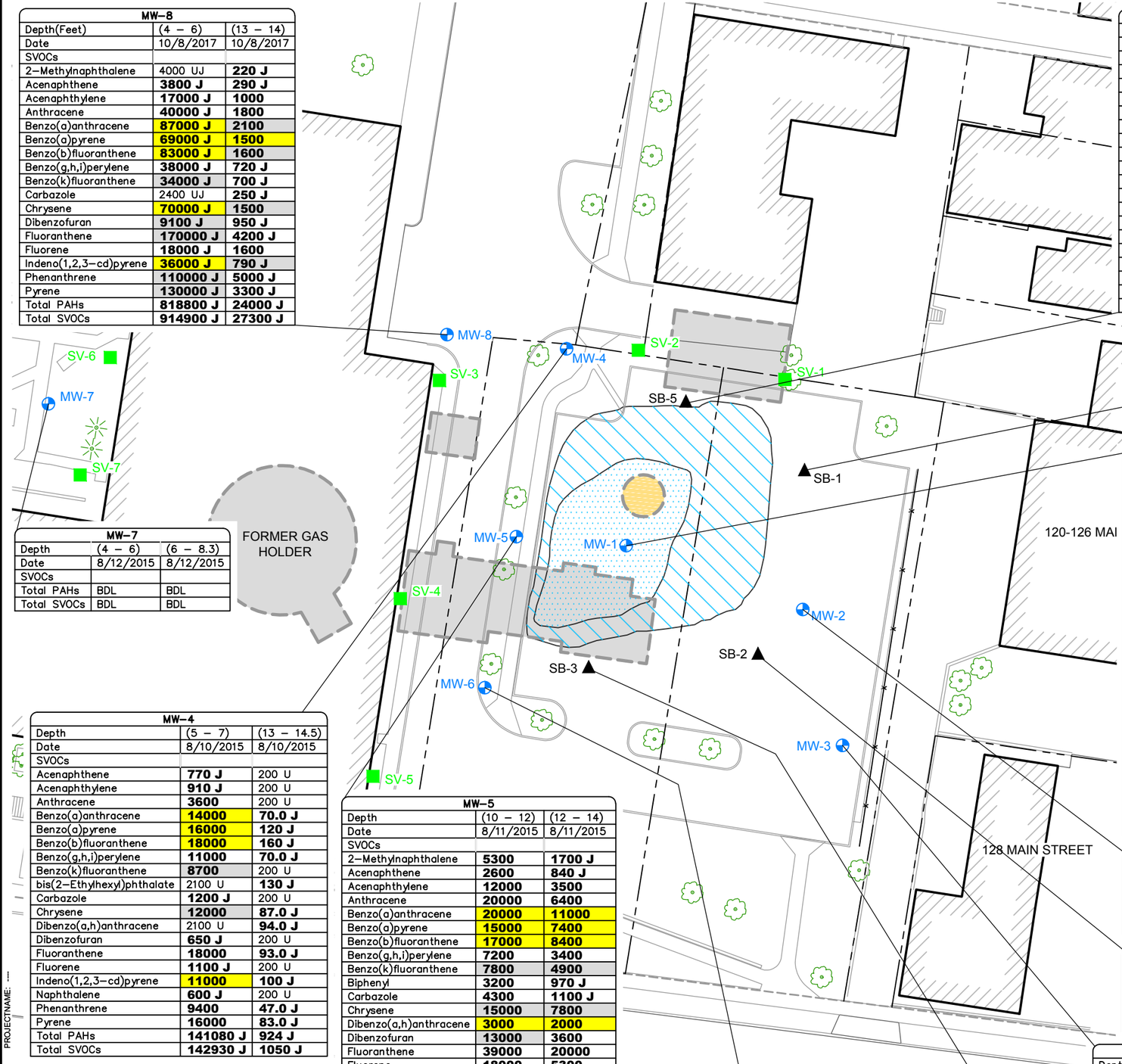
ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

SOIL VOC DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE **5**

XREFS: B0013138X01 B0013138X08 IMAGES: PROJECTNAME: ---



MW-8		
Depth(Feet)	(4 – 6)	(13 – 14)
Date	10/8/2017	10/8/2017
SVOCs		
2–Methylnaphthalene	4000 UJ	**220 J**
Acenaphthene	**3800 J**	**290 J**
Acenaphthylene	**17000 J**	**1000**
Anthracene	**40000 J**	**1800**
Benzo(a)anthracene	**87000 J**	**2100**
Benzo(a)pyrene	**69000 J**	**1500**
Benzo(b)fluoranthene	**83000 J**	**1600**
Benzo(g,h,i)perylene	**38000 J**	**720 J**
Benzo(k)fluoranthene	**34000 J**	**700 J**
Carbazole	2400 UJ	**250 J**
Chrysene	**70000 J**	**1500**
Dibenzofuran	**9100 J**	**950 J**
Fluoranthene	**170000 J**	**4200 J**
Fluorene	**18000 J**	**1600**
Indeno(1,2,3–cd)pyrene	**36000 J**	**790 J**
Phenanthrene	**110000 J**	**5000 J**
Pyrene	**130000 J**	**3300 J**
Total PAHs	**818800 J**	**24000 J**
Total SVOCs	**914900 J**	**27300 J**

MW-7		
Depth	(4 – 6)	(6 – 8.3)
Date	8/12/2015	8/12/2015
SVOCs		
Total PAHs	BDL	BDL
Total SVOCs	BDL	BDL

MW-4		
Depth	(5 – 7)	(13 – 14.5)
Date	8/10/2015	8/10/2015
SVOCs		
Acenaphthene	**770 J**	200 U
Acenaphthylene	**910 J**	200 U
Anthracene	**3600**	200 U
Benzo(a)anthracene	**14000**	**70.0 J**
Benzo(a)pyrene	**16000**	**120 J**
Benzo(b)fluoranthene	**18000**	**160 J**
Benzo(g,h,i)perylene	**11000**	**70.0 J**
Benzo(k)fluoranthene	**8700**	200 U
bis(2–Ethylhexyl)phthalate	2100 U	**130 J**
Carbazole	**1200 J**	200 U
Chrysene	**12000**	**87.0 J**
Dibenzo(a,h)anthracene	2100 U	**94.0 J**
Dibenzofuran	**650 J**	200 U
Fluoranthene	**18000**	**93.0 J**
Fluorene	**1100 J**	200 U
Indeno(1,2,3–cd)pyrene	**11000**	**100 J**
Naphthalene	**600 J**	200 U
Phenanthrene	**9400**	**47.0 J**
Pyrene	**16000**	**83.0 J**
Total PAHs	**141080 J**	**924 J**
Total SVOCs	**142930 J**	**1050 J**

MW-5		
Depth	(10 – 12)	(12 – 14)
Date	8/11/2015	8/11/2015
SVOCs		
2–Methylnaphthalene	**5300**	**1700 J**
Acenaphthene	**2600**	**840 J**
Acenaphthylene	**12000**	**3500**
Anthracene	**20000**	**6400**
Benzo(a)anthracene	**20000**	**11000**
Benzo(a)pyrene	**15000**	**7400**
Benzo(b)fluoranthene	**17000**	**8400**
Benzo(g,h,i)perylene	**7200**	**3400**
Benzo(k)fluoranthene	**7800**	**4900**
Biphenyl	**3200**	**970 J**
Carbazole	**4300**	**1100 J**
Chrysene	**15000**	**7800**
Dibenzo(a,h)anthracene	**3000**	**2000**
Dibenzofuran	**13000**	**3600**
Fluoranthene	**39000**	**20000**
Fluorene	**18000**	**5300**
Indeno(1,2,3–cd)pyrene	**7400**	**4000**
Naphthalene	**27000**	**9600**
Phenanthrene	**44000**	**16000**
Pyrene	**30000**	**15000**
Total PAHs	**285000**	**125540 J**
Total SVOCs	**310800**	**132910 J**

MW-6		
Depth	(9 – 11)	(13 – 14.2)
Date	8/12/2015	8/12/2015
SVOCs		
Total PAHs	BDL	BDL
Total SVOCs	BDL	BDL

SB-3		
Depth	(7 – 9)	(9 – 11)
Date	8/13/2015	8/13/2015
SVOCs		
Total PAHs	BDL	BDL
Total SVOCs	BDL	BDL

SB-5		
Depth	(9 – 11)	(11 – 13.5)
Date	8/14/2015	8/14/2015
SVOCs		
Acenaphthylene	**8600 J**	4000 U
Anthracene	**18000 J**	4000 U
Benzo(a)anthracene	**36000 J**	**800 J**
Benzo(a)pyrene	**30000 J**	**740 J**
Benzo(b)fluoranthene	**32000 J**	4000 U
Benzo(g,h,i)perylene	**16000 J**	4000 U
Benzo(k)fluoranthene	**25000 J**	4000 U
Carbazole	**2500 J**	4000 U
Chrysene	**45000 J**	**1200 J**
Dibenzo(a,h)anthracene	**5000 J**	4000 U
Dibenzofuran	**4400 J**	4000 U
Fluoranthene	**82000 J**	**1800 J**
Fluorene	**8800 J**	4000 U
Indeno(1,2,3–cd)pyrene	**15000 J**	4000 U
Phenanthrene	**59000 J**	**1700 J**
Pyrene	**71000 J**	**1300 J**
Total PAHs	**451400 J**	**7540 J**
Total SVOCs	**458300 J**	**7540 J**

SB-1		
Depth	(7 – 9)	(9 – 11)
Date	8/13/2015	8/13/2015
SVOCs		
Fluoranthene	**340 J**	4000 U
Pyrene	**280 J**	4000 U
Total PAHs	**620 J**	BDL
Total SVOCs	**620 J**	BDL

MW-1		
Depth	(5 – 7)	(9 – 11)
Date	8/11/2015	8/11/2015
SVOCs		
2,4–Dimethylphenol	**5300**	200 U
2–Methylnaphthalene	**60000**	200 U
2–Methylphenol	**3600 J**	200 U
4–Methylphenol	**5900 J**	390 U
Acenaphthene	**9700**	200 U
Acenaphthylene	**11000**	200 U
Anthracene	**33000**	200 U
Benzo(a)anthracene	**30000**	200 U
Benzo(a)pyrene	**20000**	200 U
Benzo(b)fluoranthene	**22000**	200 U
Benzo(g,h,i)perylene	**9100**	200 U
Benzo(k)fluoranthene	**9200**	200 U
Biphenyl	**9400**	200 U
Carbazole	**9500**	200 U
Chrysene	**23000**	**84.0 J**
Dibenzofuran	**28000**	200 U
Fluoranthene	**58000**	200 U
Fluorene	**35000**	200 U
Indeno(1,2,3–cd)pyrene	**9200**	200 U
Naphthalene	**160000 D**	200 U
Phenanthrene	**140000 D**	200 U
Pyrene	**51000**	200 U
Total PAHs	**620200**	**84 J**
Total SVOCs	**741900 J**	**84 J**

MW-2		
Depth	(5 – 7)	(9 – 13)
Date	8/12/2015	8/12/2015
SVOCs		
Total PAHs	BDL	BDL
Total SVOCs	BDL	BDL

SB-2		
Depth	(7 – 9)	(9 – 11)
Date	8/13/2015	8/13/2015
SVOCs		
Total PAHs	BDL	BDL
Total SVOCs	BDL	BDL

MW-3		
Depth	(7 – 9)	(9 – 10.2)
Date	8/13/2015	8/13/2015
SVOCs		
2–Methylnaphthalene	**1200 J**	3600 U
Naphthalene	**940 J**	3600 U
Total PAHs	**940 J**	BDL
Total SVOCs	**2140 J**	BDL

LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- BUILDING LINE
- FENCE LINE
- VEGETATION
- FORMER MGP STRUCTURE
- LIMITS OF BEDROCK EXCAVATION
- LIMITS OF OVERBURDEN EXCAVATION
- FORMER STONE/BRICK STRUCTURE CONTAINING COAL TAR
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- SOIL VAPOR SAMPLE LOCATION

NOTES:

1. RESULTS ARE IN UNITS OF MICROGRAMS PER LITER (ug/L)
2. ONLY DETECTED CONSTITUENTS ARE PRESENTED.
3. PAH – POLYCYCLIC AROMATIC HYDROCARBON
4. SVOC – SEMIVOLATILE ORGANIC COMPOUND
5. DEPTHS ARE IN FEET BELOW GROUND SURFACE
6. NA – NOT ANALYZED
7. BDL – BELOW DETECTION LIMITS
8. J – INDICATES AN ESTIMATED CONCENTRATION
9. U – INDICATES THE CONSTITUENT WAS NOT DETECTED ABOVE THE IDENTIFIED CONCENTRATION
10. A BOLD RESULT INDICATES CONSTITUENT DETECTION
11. GRAY SHADING INDICATES RESULT EXCEEDS THE NYSDEC PART 375 UNRESTRICTED USE SCO.
12. YELLOW SHADING INDICATES RESULT EXCEEDS THE NYSDEC PART 375 COMMERCIAL USE SCO.
13. FORMER LOCATIONS OF GAS WORKS STRUCTURES FROM SANBORN LIBRARY, LLC 1906 MAP. LOCATIONS ARE APPROXIMATE.
14. LIMITS OF THE 2002/2003 OVERBURDEN EXCAVATION, BEDROCK EXCAVATION, AND LOCATIONS OF THE FORMER STRUCTURE CONTAINING COAL TAR FROM REPORT OF ACTIVITIES AT LL–LOT, SUNY GENESEO (2003). LOCATIONS ARE APPROXIMATE.

SOURCE:

1. BASEMAP INFORMATION PROVIDED BY FISHER ASSOCIATES, LLC. DATED JUNE, 2015. FILENAME: GENESEO TOPO.DWG. GEOREFERENCED TO NEW YORK STATE PLANE NAD83 COORDINATE SYSTEM.

0 40' 80'

GRAPHIC SCALE

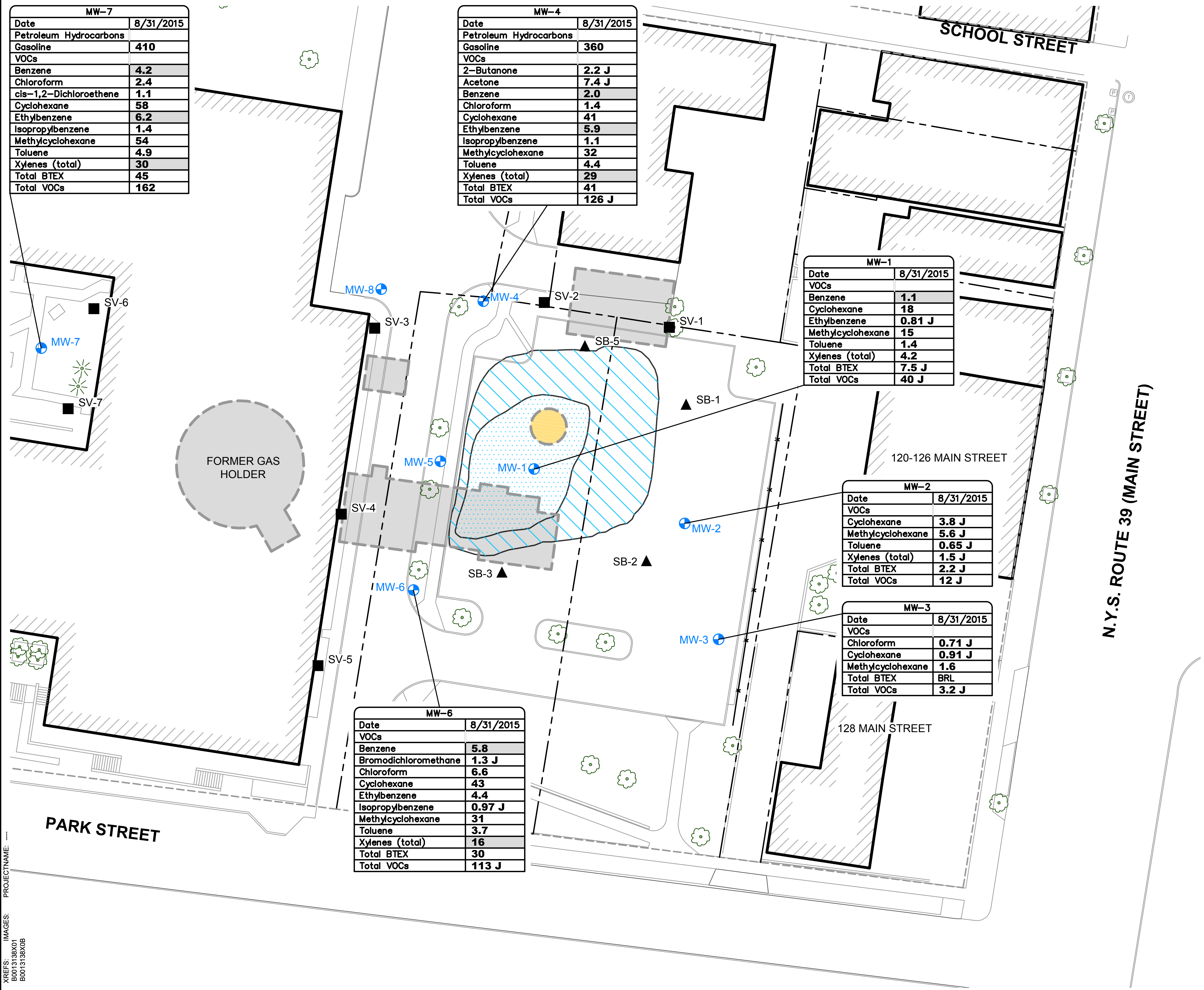
ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

SOIL SVOC DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6

CITY:CRANBURY-NJ DIV/GROUP-ENVCAD DB:JMEYER LD:JMEYER PIC:K.WHITE PM:B.AHRENS TM:B.AHRENS LYR:(OPT)ON=*;OFF=*REF*
C:\Users\jmeyer\OneDrive - ARCADIS\BIM 360 DOCS\ROCHESTER GAS & ELECTRIC\R&E GENESEO\PARK ST - SITE CH\2017\B0013138.0006\01-DWG\00003\B0013138C04.dwg LAYOUT: 6 SAVED: 12/13/2017 8:31 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ----
PLOTTED: 12/13/2017 8:32 PM BY: MEYER, JULIE PROJECTNAME: ---
XREFS: IMAGES:
B0013138X01
B0013138X0B



MW-7	
Date	8/31/2015
Petroleum Hydrocarbons	
Gasoline	410
VOCs	
Benzene	4.2
Chloroform	2.4
cis-1,2-Dichloroethene	1.1
Cyclohexane	58
Ethylbenzene	6.2
Isopropylbenzene	1.4
Methylcyclohexane	54
Toluene	4.9
Xylenes (total)	30
Total BTEX	45
Total VOCs	162

MW-4	
Date	8/31/2015
Petroleum Hydrocarbons	
Gasoline	360
VOCs	
2-Butanone	2.2 J
Acetone	7.4 J
Benzene	2.0
Chloroform	1.4
Cyclohexane	41
Ethylbenzene	5.9
Isopropylbenzene	1.1
Methylcyclohexane	32
Toluene	4.4
Xylenes (total)	29
Total BTEX	41
Total VOCs	126 J

MW-1	
Date	8/31/2015
VOCs	
Benzene	1.1
Cyclohexane	18
Ethylbenzene	0.81 J
Methylcyclohexane	15
Toluene	1.4
Xylenes (total)	4.2
Total BTEX	7.5 J
Total VOCs	40 J

MW-2	
Date	8/31/2015
VOCs	
Cyclohexane	3.8 J
Methylcyclohexane	5.6 J
Toluene	0.65 J
Xylenes (total)	1.5 J
Total BTEX	2.2 J
Total VOCs	12 J

MW-3	
Date	8/31/2015
VOCs	
Chloroform	0.71 J
Cyclohexane	0.91 J
Methylcyclohexane	1.6
Total BTEX	BRL
Total VOCs	3.2 J

MW-6	
Date	8/31/2015
VOCs	
Benzene	5.8
Bromodichloromethane	1.3 J
Chloroform	6.6
Cyclohexane	43
Ethylbenzene	4.4
Isopropylbenzene	0.97 J
Methylcyclohexane	31
Toluene	3.7
Xylenes (total)	16
Total BTEX	30
Total VOCs	113 J

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- BUILDING LINE
- FENCE LINE
- VEGETATION
- FORMER MGP STRUCTURE
- LIMITS OF BEDROCK EXCAVATION
- LIMITS OF OVERBURDEN EXCAVATION
- FORMER STONE/BRICK STRUCTURE CONTAINING COAL TAR
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- SOIL VAPOR SAMPLE LOCATION

NOTES:

1. RESULTS ARE IN UNITS OF MICROGRAMS PER LITER (ug/L)
2. ONLY DETECTED CONSTITUENTS ARE PRESENTED.
3. BTEX – BENZENE, TOLUENE, ETHYLBENZENE, XYLENE
4. VOC – VOLATILE ORGANIC COMPOUND
5. BRL – BELOW REPORTING LIMITS
6. J – INDICATES AN ESTIMATED CONCENTRATION
7. U – INDICATES THE CONSTITUENT WAS NOT DETECTED ABOVE THE IDENTIFIED CONCENTRATION
8. A BOLD RESULT INDICATES CONSTITUENT DETECTION
9. SHADING INDICATES RESULT EXCEEDS THE NYSDEC TOGS 1.1.1
10. FORMER LOCATIONS OF GAS WORKS STRUCTURES FROM SANBORN LIBRARY, LLC 1906 MAP. LOCATIONS ARE APPROXIMATE.
11. LIMITS OF THE 2002/2003 OVERBURDEN EXCAVATION, BEDROCK EXCAVATION, AND LOCATIONS OF THE FORMER STRUCTURE CONTAINING COAL TAR FROM REPORT OF ACTIVITIES AT LL-LOT, SUNY GENESEO (2003). LOCATIONS ARE APPROXIMATE.
12. MONITORING WELL MW-8 WAS INSTALLED SUBSEQUENT TO DATA PRESENTED HEREIN.

SOURCE:

1. BASEMAP INFORMATION PROVIDED BY FISHER ASSOCIATES, LLC. DATED JUNE, 2015. FILENAME: GENESEO TOPO.DWG. GEOREFERENCED TO NEW YORK STATE PLANE NAD83 COORDINATE SYSTEM.

0 40' 80'

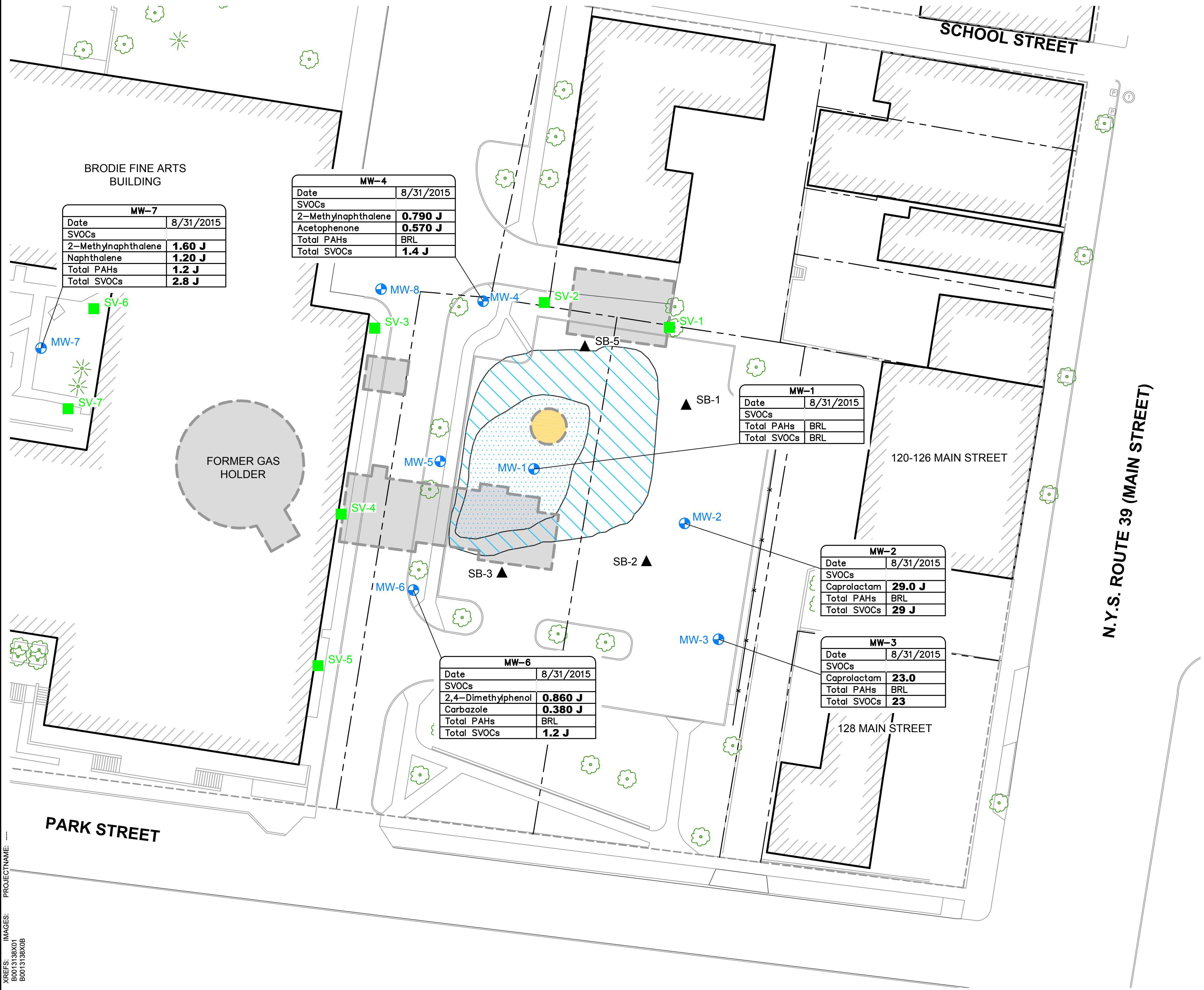
GRAPHIC SCALE

ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

GROUNDWATER VOC DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE
7



MW-7	
Date	8/31/2015
SVOCs	
2-Methylnaphthalene	**1.60 J**
Naphthalene	**1.20 J**
Total PAHs	**1.2 J**
Total SVOCs	**2.8 J**

MW-4	
Date	8/31/2015
SVOCs	
2-Methylnaphthalene	**0.790 J**
Acetophenone	**0.570 J**
Total PAHs	BRL
Total SVOCs	**1.4 J**

MW-1	
Date	8/31/2015
SVOCs	
Total PAHs	BRL
Total SVOCs	BRL

MW-2	
Date	8/31/2015
SVOCs	
Caprolactam	**29.0 J**
Total PAHs	BRL
Total SVOCs	**29 J**

MW-3	
Date	8/31/2015
SVOCs	
Caprolactam	**23.0**
Total PAHs	BRL
Total SVOCs	**23**

MW-6	
Date	8/31/2015
SVOCs	
2,4-Dimethylphenol	**0.860 J**
Carbazole	**0.380 J**
Total PAHs	BRL
Total SVOCs	**1.2 J**

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- BUILDING LINE
- FENCE LINE
- VEGETATION
- FORMER MGP STRUCTURE
- LIMITS OF BEDROCK EXCAVATION
- LIMITS OF OVERBURDEN EXCAVATION
- FORMER STONE/BRICK STRUCTURE CONTAINING COAL TAR
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- SOIL VAPOR SAMPLE LOCATION

NOTES:

1. RESULTS ARE IN UNITS OF MICROGRAMS PER LITER (ug/L)
2. ONLY DETECTED CONSTITUENTS ARE PRESENTED.
3. PAH – POLYCYCLIC AROMATIC HYDROCARBON
4. SVOC – SEMIVOLATILE ORGANIC COMPOUND
5. BRL – BELOW REPORTING LIMITS
6. J – INDICATES AN ESTIMATED CONCENTRATION
7. U – INDICATES THE CONSTITUENT WAS NOT DETECTED ABOVE THE IDENTIFIED CONCENTRATION
8. A BOLD RESULT INDICATES CONSTITUENT DETECTION
9. SHADING INDICATES RESULT EXCEEDS THE NYSDEC TOGS 1.1.1
10. FORMER LOCATIONS OF GAS WORKS STRUCTURES FROM SANBORN LIBRARY, LLC 1906 MAP. LOCATIONS ARE APPROXIMATE.
11. LIMITS OF THE 2002/2003 OVERBURDEN EXCAVATION, BEDROCK EXCAVATION, AND LOCATIONS OF THE FORMER STRUCTURE CONTAINING COAL TAR FROM REPORT OF ACTIVITIES AT LL-LOT, SUNY GENESEO (2003). LOCATIONS ARE APPROXIMATE.
12. MONITORING WELL MW-8 WAS INSTALLED SUBSEQUENT TO DATA PRESENTED HEREIN.

SOURCE:

1. BASEMAP INFORMATION PROVIDED BY FISHER ASSOCIATES, LLC. DATED JUNE, 2015. FILENAME: GENESEO TOPO.DWG. GEOREFERENCED TO NEW YORK STATE PLANE NAD83 COORDINATE SYSTEM.

0 40' 80'
GRAPHIC SCALE

ROCHESTER GAS & ELECTRIC
PARK STREET FORMER MGP SITE
SITE MANAGEMENT PLAN

GROUNDWATER SVOC DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE
8

CITY:CRANBURY-NJ DIV/GROUP:ENVCAD DB:JMEYER LD:JMEYER PIC:K.WHITE PM:B.AHRENS TM:B.AHRENS LYR:(Opt)ON=*;OFF=*REF*
LAYOUT: 8 SAVED: 12/12/2017 8:56 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ---
XREFS: B0013138X01 B0013138X0B IMAGES: PROJECTNAME: ---

Appendix A

Declaration of Covenants and Restrictions

Mary F. Strickland , County Clerk
Livingston County Government Center
6 Court Street, Room 201
Geneseo, New York 14454
(585) 243-7010 ~ Fax (585) 243-7928

Livingston County Clerk Recording Page

Received From:
BARCLAY DAMON LLP

Return To:

No Envelope

Document Type: **DECLARATION OF COVENANTS AND RESTRICTIONS**

Receipt Number: 00609279

Grantor	Grantee
NEW YORK STATE UNIVERSITY OF	NEW YORK STATE UNIVERSITY OF

Recorded Information:

Recording Fee	$45.00
Pages Fee	$40.00
Mortage Tax Affidavit	$0.00
Total Fees:	$85.00

Property Located in Town of **Geneseo**
Village of **Geneseo**

State of New York
County of Livingston

Recorded on the 29th date of June, 2018 at 01:23:47 PM in Liber **1286** of **Deeds** at beginning page **1752**, ending at page **1760** and examined.

Mary F Strickland

Livingston County Clerk

This sheet constitutes the Clerk's endorsement required by section 319 of the Real Property Law of the State of New York

ams 06/29/2018 01:23:48 PM

Do Not Detach

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT, is made the 21 day of June, 2018, by the State University of New York, an agency of the State of New York with offices at University Plaza Albany, New York, by and on behalf of SUNY College at Geneseo, 1 College Circle, Geneseo, New York 14454.

WHEREAS, RG&E Geneseo-Park St Former MGP Site ("Site"), Site No.: V00731, is the subject of a Voluntary Cleanup Agreement executed by Rochester Gas and Electric Corporation ("RG&E") and the New York State Department of Environmental Conservation ("Department"), namely those parcels of real property formerly known as 4 and 6 Park Street in the Village of Geneseo, County of Livingston, State of New York, being the same as (or part of) that property conveyed to The People of the State of New York, acting by and through the Board of Trustees of the State University of New York by Gary L. Least by two deeds dated September 27, 2001 and recorded on October 31, 2001 in the Livingston County Clerk's office in Liber 1053 Page 241and Liber 1053 Page 246, and being more particularly described in Schedule "A", attached to this declaration and made a part hereof, and hereinafter referred to as "the Restricted Property"; and

WHEREAS, the Site may at one time have been the location of a former Manufactured Gas Plant ("MGP") operated by the historic predecessor entities which, by merger and/or consolidation, led to the corporate existence of RG&E, and the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the Existing Contamination (as defined hereafter) disposed at the Restricted Property and such remedy requires that the Restricted Property be subject to restrictive covenants; and

WHEREAS, said "Existing Contamination," as defined in the Voluntary Cleanup Agreement Section I. B., is: "any substance which is identified and characterized to the Department's satisfaction; provided that such substance either:

1) is included on the list of hazardous substances promulgated pursuant to ECL § 37-0103, and is a component of the manufactured gas plant wastes associated with the MGP operations believed to have been operated in the past at the Site, or otherwise resulted from the operations of RG&E or its predecessor entities; or

2) is included on the list of hazardous substances promulgated pursuant to ECL § 37-0103, and is commingled or intermingled with wastes which are a component of manufactured gas plant wastes associated with the MGP operations believed to have been operated in the past at the Site, or which otherwise resulted from the operations of RG&E or its predecessor entities, in a circumstance whereby the level of contamination set forth in Subparagraph 1 supra, if present alone, would independently require the implementation of remedial action."

NOW, THEREFORE, The People of the State of New York, acting by and through the Board of Trustees of the State University of New York, for itself and its successors and/or assigns, covenants that:

First, the Restricted Property subject to this Declaration of Covenants and Restrictions, is as shown on a map attached to this declaration as Schedule "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where Existing Contamination remains at the Restricted Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Restricted Property that results in the disturbance or excavation of the Restricted Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233.

Third, the owner of the Restricted Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Restricted Property shall prohibit the Restricted Property from ever being used for purposes other than non-residential uses, such as a parking lot, and Commercial uses as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial uses as described in 6 NYCRR 375-1.8(g)(2)(iv), without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Livingston 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 or Relevant Agency.

Sixth, the owner of the Restricted Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired.

Seventh, the owner of the Restricted Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and maintain such controls, unless the owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

Eighth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Restricted Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Ninth, any deed of conveyance of the Restricted Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

State University of New York

By: Denise C Battles

Print Name: Denise Battles

Title: President

Date: 6/29/18

Grantor's Acknowledgment

STATE OF NEW YORK
) ss:
COUNTY OF LIVINGSTON

On the 29th day of June, in the year 2018, before me, the undersigned, personally appeared Denise Battles, 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.

Notary Public State of New York

Sherri L. Bush

Sherri L. Bush, Notary Public
State of New York, Wyoming County
Reg No. 01BU6020854
Commission Expires Mar 22, 20 19

SCHEDULE "A"
to
Declaration of Covenants and Restrictions
For RG&E Geneseo-Park St Former MGP Site
Site No. V00731

METES AND BOUNDS DESCRIPTION OF RESTRICTED PROPERTY AS FILED IN LIVINGSTON COUNTY CLERK'S OFFICE AT LIBER 1053 PAGE 241 & LIBER 1053 PAGE 246

Property Address: 4 Park Street
Tax Map No. 80.16-1-34

ALL THAT TRACT OR PARCEL OF LAND, situate in the Village of Geneseo, Livingston County, New York, bounded and described as follows:

Beginning in the north line of Park Street, at the southeast corner of lands formerly of Frank K. Cook;

Running thence northerly, on the east line of said Cook, and a continuation thereof, 3 chains and 18 links, more or less, to land, now or formerly of Caroline Foote;

Running thence easterly, on the south line of said Foote's land, 1 chain and 18 links to the west line of Village Lots fronting on the west side of Main Street;

Running thence southerly, on the west line of said Village Lots, and parallel with the first mentioned line, 3 chains and 18 links, more or less, to the north line of Park Street; and

Running thence westerly, on the last mentioned line, 1 chain and 18 links to the place of beginning.

Containing 0.36 of an acre of land, more or less.

Being and intending to convey Parcel 2 as set out in a Bargain and Sale Deed from Paul J. Least to Gary L. Least dated September 15, 1977 and recorded in the Livingston County Clerks' Office on the same date in Liber 513 of Deeds at Page 205.

Property Address: 6 Park Street
Tax Map No. 80.16-1-33

ALL THAT TRACT OR PARCEL OF LAND, situated on the north side of Park Street in the Village of Geneseo, County of Livingston and the State of New York, bounded and described as follows:

Commencing at a point in the north line of Park Street, said point being located 178.6 feet, more or less, westerly from the west edge of the sidewalk on the west side of Main Street,

said point also being the southwesterly corner of lands of C. Leslie Brion as described in a Deed recorded in the Office of the Livingston County Clerk in Liber 316 of Deeds, Page 180;

Thence (1) North 77° 30' 00" West and along the north line of Park Street for a distance of 81.18 feet to an iron pipe, said point being the intersection of the northerly line of Park Street with and easterly line of lands of the State of New York (State University College at Geneseo);

Thence (2) North 14° 33' 00" East and along an easterly line of lands of the State of New York for a distance of 214.52 feet to an iron pipe;

Thence (3) South 79° 35' 40" East and along a southerly line of lands of the State of New York for a distance of 28.94 feet to an iron pipe, said point being the southwest corner of lands of Dorothy Wright as described in Liber 373 of Deeds, Page 883;

Thence (4) South 76° 01' 37" East and along the southerly line of said Wright for a distance of 52.27 feet to an iron pipe at the northwest corner of the aforementioned Brion lands;

Thence (5) South 14° 33' 00" West and along the westerly line of said Brion lands for a distance of 214.23 feet to the point of beginning.

Containing 0.40034 acres.

Together with all of the right, title and interest of the Grantor in and to rights of way to and from the said premises as they may exist.

The said premises are more particularly described on a map of a survey made by Denluck, Thomas, McGrail & Associates dated October 5, 1970 which is recorded in the Livingston County Clerk's Office in Liber 407, Page 949.

Being and intending to convey Parcel 3 as set forth in a Bargain and Sale Deed from Paul J. Least to Gary L. Least dated September 15, 1977 and recorded in the Livingston County Clerk's Office on the same date in Liber 513 of Deeds at Page 205.

METES AND BOUNDS DESCRIPTION OF RESTRICTED PROPERTY (AS MEASURED) IN THE INSTRUMENT SURVEY COMPLETED AND SIGNED JUNE 21, 2018 BEING AND INTENDING TO DESCRIBE THE SAME PROPERTY AS THE ABOVE LEGAL DESCRIPTION

TAX ID NO. 80.16 – 1 – 34
AND TAX ID NO. 80.16 – 1 – 33
Area: 0.778 Acres

All that piece or parcel of land situate in the Village of Geneseo, County of Livingston, State of New York and being part bounded and described as follows:

Beginning at a point in the northerly right of way of Park Street (66' wide), said point being 175.8 feet westerly from the westerly right of way of Main Street (N.Y.S. Route 39) (99' wide) at its intersection with the division line between the lands of The People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 34) on the east and the lands of The People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 33) on the west; thence

1. North 82°50' 41" West, along the northerly right of way of Park Street (66' wide) a distance of 81.18 feet to a point on the division line between the lands of The People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 33) on the east and the lands of The State University of New York (reputed owner) (Tax ID. No. 80.15 – 1 – 1.1) on the west; thence

2. Northerly and Easterly along the last mentioned division line the following two (2) courses and distances:

   1) North 09°12' 19" East, a distance of 214.52 feet to a point; thence

   2) South 84°56' 21" East, a distance of 28.94 feet to a point on the division line between the lands of The People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 33) on the south and the lands of Geneseo Foundation, Inc. (reputed owner) (Tax ID. No. 80.16 – 1 – 32.2) on the north; thence

3. South 81°14' 29" East, along the last mentioned division line and the lands of Caplan Ventures, Barry Caplan (reputed owner) (Tax ID. No. 80.16 – 1 – 32.1) on the north a distance of 52.27 feet to a point on the division line between the lands of The People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 33) on the west and the lands of The People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 34) on the east; thence

4. South 81°14' 29" East, a distance of 67.56 feet, along the division line between the lands of Caplan Ventures, Barry Caplan (reputed owner) (Tax ID. No. 80.16 – 1 – 32.1) on the north and the lands of the People of the State of New York (reputed owner) (Tax ID. No.

80.16 – 1 – 34) on the south to a point on the division line between the lands of the People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 34) on the south and the lands of 118 Main Street Geneseo, LLC (reputed owner) (Tax ID. No. 80.16 – 1 – 31) on the north; thence

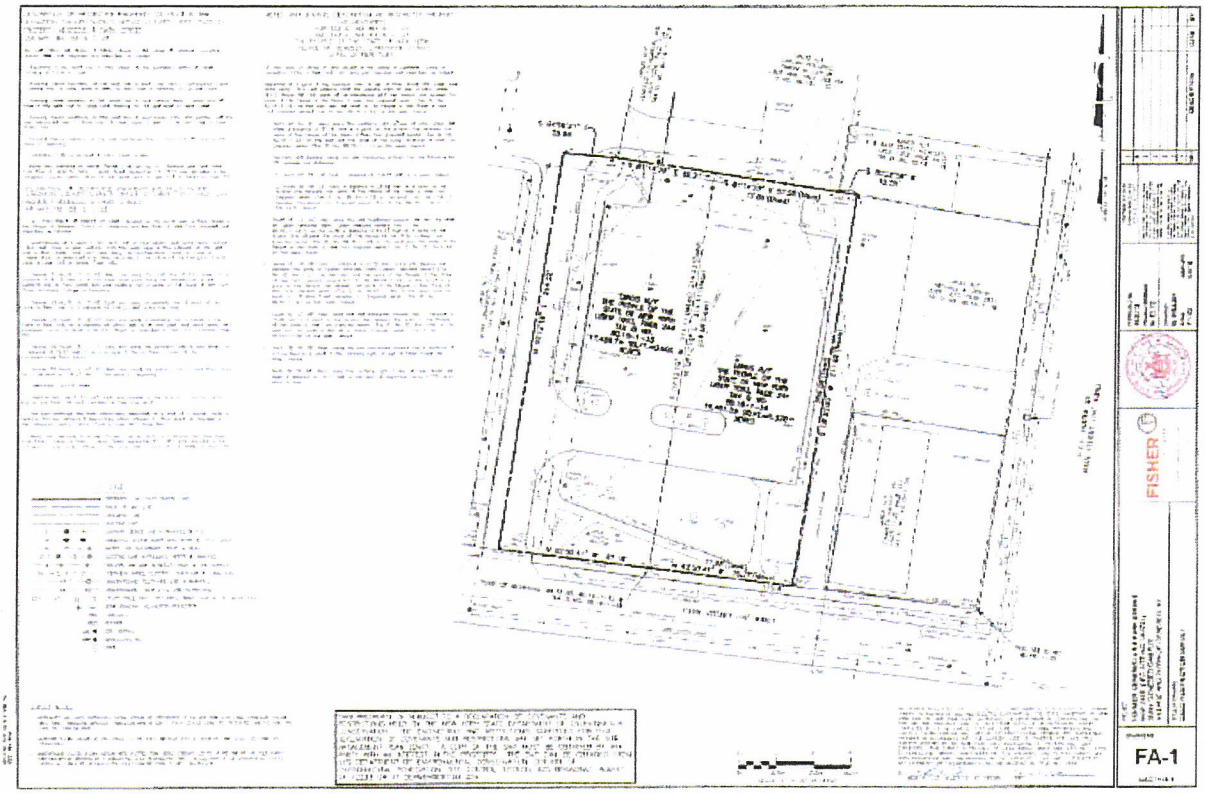
5. South 80°22' 58" East, along the last mentioned division line a distance of 10.28 feet to a point on the division line between the lands of the People of the State of New York (reputed owner) (Tax ID. No. 80.16 – 1 – 34) on the west and the lands of Michael A. Bishop (reputed owner) (Tax ID. No. 80.16 – 1 – 35) on the east; thence

6. South 09°30' 09" West, along the last mentioned division line a distance of 211.82 feet to a point in the northerly right of way of Park Street (66' wide); thence

7. North 82°50' 41" West, along the northerly right of way of Park Street (66' wide) a distance of 76.77 feet to the point of beginning, being 0.778 acres more or less.

SCHEDULE "B"
to
Declaration of Covenants and Restrictions
For RG&E Geneseo-Park St Former MGP Site
Site No. V00731

MAP OF PROPERTY



Appendix B

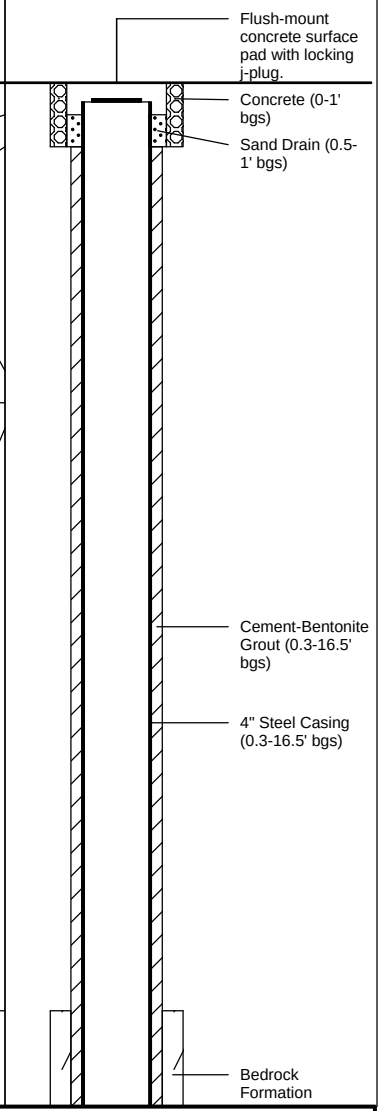
Soil Boring and Monitoring Well Logs

Date Start/Finish: August 11-12, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019329.23
Easting: 1353704.50
Casing Elevation: 758.41' AMSL
Borehole Depth: 36.5' bgs
Surface Elevation: 758.42' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: **MW-1**
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
760 / 0								
755 / 5	1	0-5	NA	NA	NA	0.7 0.1 13.8		Asphalt. Gravel road base. Brown medium to coarse SAND and medium to coarse rounded to angular GRAVEL, moist. Large COBBLES 2-4.5 ft bgs, red and white brick debris at 3.5 ft bgs. Gray-brown SILTY CLAY, trace fine SAND, trace fine to medium Gravel, medium plasticity, no dilatancy, soft.
750 / 10	2	5-9	NA	NA	4.0	391.0 194.2 18.3 9.4		Brown SILT and very fine to coarse angular GRAVEL, some tar-like material, strong odor, moist. Light Gray SILT and very fine to medium angular GRAVEL, little to trace Clay, brittle, dry. Material possibly stone fill.
	3	9-11	NA	NA	2.0	0.3 0.2		
745 / 15	4	11-14.5	NA	NA	0.2	0.2		
	5	14.5-16.5	NA	0	2.0	NA		Dark gray SHALE, breaks across entire length.



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-1**

Borehole Depth: 36.5' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
740 / 20	6	16.5-21.5	6.02 min/ft 5.07 min/ft 5.35 min/ft 4.45 min/ft 4.28 min/ft	6	4.7	NA		Dark gray SHALE, 15-deg joint at 17.4 ft bgs, mechanical breaks across entire length.	Bedrock Formation
735 / 25	7	21.5-25.5	3.17 min/ft 3.50 min/ft 3.75 min/ft 3.83 min/ft 3.75 min/ft	73	5.0	NA		Dark gray SHALE, horizontal joint 1-2.5mm wide at 23.8 ft bgs, joints along bedding planes at 22.2, 23.2, 24.87, 25, 25.5 ft bgs.	Open Bedrock Hole (16.5-36.5' bgs)
730 / 30	8	25.5-30.5	3.25 min/ft 3.50 min/ft 3.00 min/ft 3.00 min/ft 2.50 min/ft	91	5.0	NA		Dark gray SHALE, horizontal joint 1-2 mm wide at 29.1, 1-3mm wide at 29.75, 26.9, 27.55, 28.1, and 30.8 ft bgs, 45-deg mechanical break 30.1-30.3 ft bgs.	
725 / 35	9	30.5-35.5	2.50 min/ft 2.50 min/ft 2.25 min/ft 2.25 min/ft 2.50 min/ft	93	5.0	NA		Dark gray SHALE, horizontal joint 1-2mm wide at 32.45 and 32.83 ft bgs, 15-deg joint 34.7-34.75 ft bgs.	

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-1**

Borehole Depth: 36.5' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
								End of boring at 36.5' bgs.	

720
40
715
45
710
50
705
55

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

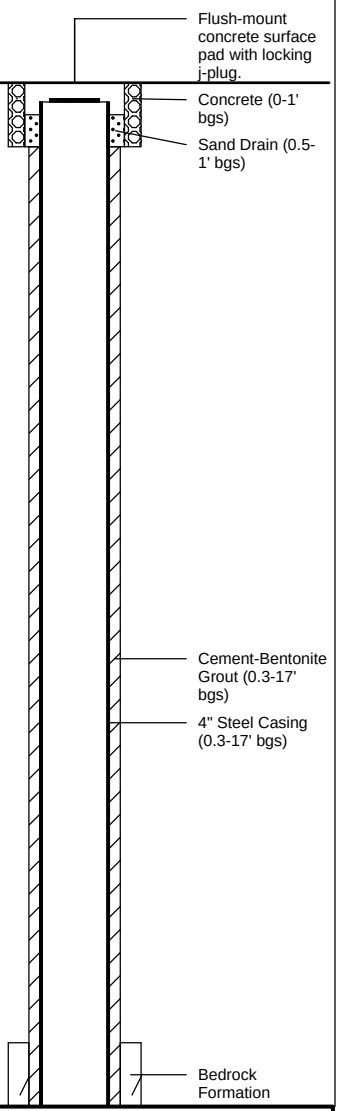
ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 12 and 14, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019307.06
Easting: 1353766.02
Casing Elevation: 760.25' AMSL
Borehole Depth: 37' bgs
Surface Elevation: 760.29' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: **MW-2**
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0 / 760								
						0.0		Asphalt.
								Gravel road base.
	1	0-5	NA	NA	NA	0.0		Dark gray very fine to very coarse subrounded GRAVEL, some to little very coarse Sand, little small Cobbles, moist.
						0.0		Brown medium to coarse SAND and subrounded to subangular very fine to very coarse GRAVEL, moist.
						0.0		Yellow-brown SILT and very fine to fine SAND, trace medium to very coarse subrounded to subangular Gravel, trace brick and charcoal debris, soft.
5 / 755	2	5-9	NA	NA	4.0	0.0		Yellow-brown very fine to fine SAND, trace Silt, trace Shale fragments, loose, medium dense, dry.
						0.0		
10 / 750	3	9-13	NA	NA	NA	0.0		
						0.0		
	4	13-15	NA	NA	NA	NA		NO RECOVERY. Top of weathered SHALE bedrock at 13 ft bgs. Top of competent SHALE bedrock at 15 ft bgs.
15 / 745								Dark gray SHALE, breaks across entire length.



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-2**

Borehole Depth: 37' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
	5	15-17	NA	0	2.0				
			NA					Dark gray SHALE, medium hard, 60-deg joint 17.70-17.73 ft bgs, 60-deg joint 17.87-17.96 ft bgs, 50-deg joint 18.95-18.95 ft bgs, 12-deg joint 20.30 ft bgs, horizontal joint 20.40 ft bgs, 82-deg joint 20.60-21.16 ft bgs.	
			NA						
	6	17-22	5.00 min/ft	27	4.5	NA			Bedrock Formation
20 740			10.00 min/ft						
			7.33 min/ft						
			8.50 min/ft					Dark gray SHALE, medium hard, horizontal joint at 22.20, 22.35, 23.10, 23.50, 25.0, 25.2 ft bgs, mechanical break at 23.6, 24.6, 25.23, 25.95, 26.5 ft bgs, broken zone 2.1-2.25 ft bgs.	
			NA						
	7	22-27	4.50 min/ft	58	4.5	NA			
25 735			4.33 min/ft						Open Bedrock Hole (17-37' bgs)
			5.33 min/ft						
			3.85 min/ft					Dark gray SHALE, horizontal joint 1-2mm wide 27.5, 1-3mm wide 28.25 ft bgs, 5-deg joint 1-2mm wide 28.65 ft bgs, 80-deg calcium filled joint 29.3-29.75, 30.4-32 ft bgs, broken zone 31.4-31.8 ft bgs.	
			4.53 min/ft						
	8	27-32	5.02 min/ft	91	5.0	NA			
30 730			7.15 min/ft						
			6.58 min/ft						
			3.85 min/ft					Dark gray SHALE, 10-deg joint 1mm wide 34 ft bgs, mechanical breaks at 34.2, 34.95, 36.4, 36.95 ft bgs.	
			3.93 min/ft						
	9	32-37	4.53 min/ft	96	5.0	NA			
35 725			3.43 min/ft						

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-2**

Borehole Depth: 37' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
			3.73 min/ft					End of boring at 37' bgs.	
40 / 720									
45 / 715									
50 / 710									
55 / 705									

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

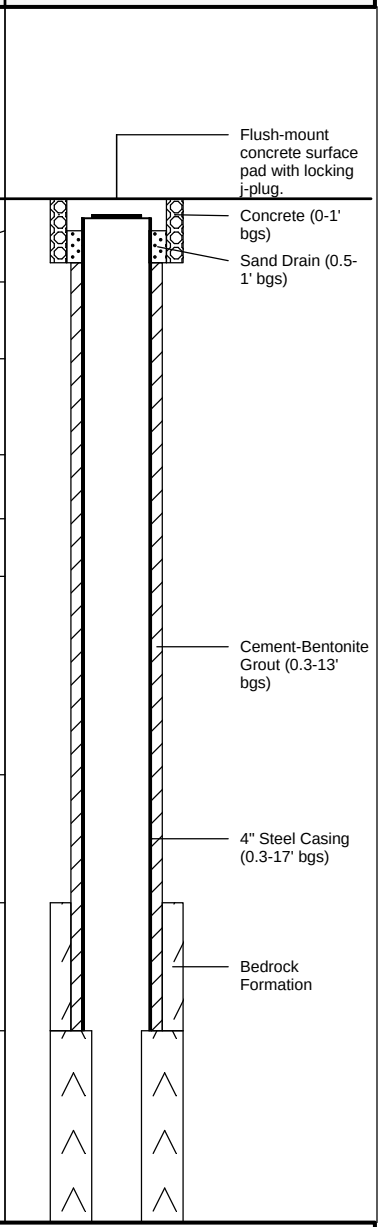
Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Date Start/Finish: August 13-14, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019260.91
Easting: 1353779.99
Casing Elevation: 761.66' AMSL
Borehole Depth: 33' bgs
Surface Elevation: 761.65' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: MW-3
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0 / 761						NA		Asphalt.
								Gravel road base.
						2.3		Light reddish brown SILTY CLAY, white and gray mottled, trace fine Sand, trace fine subrounded Gravel, high plasticity, no dilatancy.
	1	0-5	NA	NA	NA	4.4		Light reddish brown SILT, gray mottling, some Clay, trace rounded fine Gravel, trace rootlets, no plasticity, no dilatancy, stiff, dry.
						438		Yellow-brown SILT, olive gray mottling, trace rounded fine Gravel, no plasticity, no dilatancy, trace rootlets, medium stiff, petroleum-like odor, dry.
5 / 756						1586		Gray very fine SAND, SILT and CLAY, some to little very fine to medium angular Gravel, medium stiff, wet (due to rain overnight).
						154.6		Gray-brown very fine to medium SAND and SILT, little Clay, some to little very fine to very coarse angular to rounded gravel, medium stiff, strong petroleum-like odor, dry to moist.
	2	5-9	NA	NA	4.0	1309		
						1025		
						79.8		
10 / 751						8.2		Gray-brown very fine to fine SAND and SILT, trace Clay, little to trace very fine to coarse angular Gravel and weathered Shale bedrock dry to moist. Competent bedrock at 11 ft bgs.
	3	9-11	NA	NA	1.7	22.3		
						75.6		
	4	11-13	NA	0	2.0	NA		Dark gray fragments of SHALE.
15 / 746			NA					Dark gray SHALE, medium hard, broken zone 13-14.2 ft bgs, mechanical breaks at 14.2, 14.35, 14.65, 14.8, 14.86, 15.0, 15.2, 15.6, 15.7 ft bgs, broken zone 15.9-18 ft bgs.
			3.37 min/ft					
	5	13-18	4.20 min/ft	0	5.0	NA		



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-3**

Borehole Depth: 33' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
745			4.67 min/ft 4.43 min/ft					Dark gray SHALE, medium hard, broken zone 13-14.2 ft bgs, mechanical breaks at 14.2, 14.35, 14.65, 14.8, 14.86, 15.0, 15.2, 15.6, 15.7 ft bgs, broken zone 15.9-18 ft bgs.	
20	6	18-23	6.63 min/ft 3.87 min/ft 4.25 min/ft 4.42 min/ft 4.15 min/ft	0	4.6	NA		Dark gray SHALE, medium hard, mechanical breaks along bedding planes 18.65, 18.7, 18.85, 19.4, 19.7, 19.9, 20.25 ft bgs, broken zone 20.6-21.4 ft bgs, 80-deg joint 20.7-22.6 ft bgs, mechanical break at 21.5, 22.0, 22.2, 22.5, 22.7 ft bgs.	Bedrock Formation
740									
25	7	23-28	4.38 min/ft 4.02 min/ft 3.08 min/ft 4.98 min/ft NA	25	4.3	NA		Dark gray SHALE, medium hard, mechanical break 23.4 ft bgs, horizontal joint 23.65, 24.18 ft bgs, broken zone 24.37-24.6 ft bgs, horizontal joint 23.15 ft bgs, broken zone 23.35-23.45 ft bgs, mechanical breaks 23.65, 23.87, 24.22 ft bgs, horizontal joint 24.30 ft bgs, mechanical break 24.57, 24.9 ft bgs, broken zone 25.2-25.4 ft bgs.	Open Bedrock Hole (13-33' bgs)
735									
30	8	28-33	NA 5.78 min/ft 3.27 min/ft 4.28 min/ft 4.00 min/ft	86	5.0	NA		Dark gray SHALE, medium hard, horizontal joint 28.44, 29.05-29.06, 29.2 ft bgs, mechanical break 29.95 ft bgs, broken zone 30.3-30.57 ft bgs, vertical joint 30.6-32.25 ft bgs, mechanical break 31 ft bgs, horizontal joint 31.58, 32 ft bgs, mechanical break 32.3, 32.9 ft bgs.	
730									
35								End of boring at 33' bgs.	

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

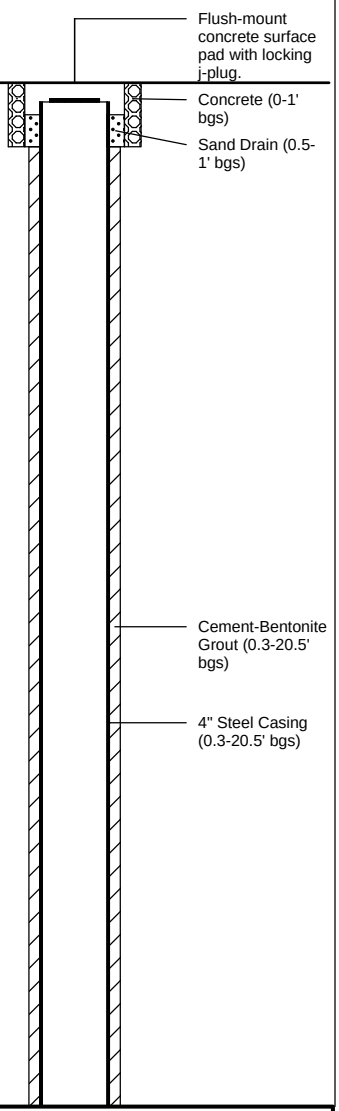
Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Date Start/Finish: August 10-11 and 17, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019399.75
Easting: 1353683.64
Casing Elevation: 756.18' AMSL
Borehole Depth: 40.5' bgs
Surface Elevation: 756.07' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: **MW-4**
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0 / 755	1	0-5	NA	NA	NA	2.1		TOPSOIL. Brown fine SAND, little fine to medium subrounded to angular Gravel, trace roots, dry. Dark brown SILT and very fine to fine SAND, some fine to medium Gravel, trace brick debris and rootlets. Little very fine to fine Sand 4-5 ft bgs.
5 / 750	2	5-9	NA	NA	1.0	1.3 0.0		Brown fine to coarse SAND and SILT, some to little very fine to coarse angular gravel, trace Slag, trace brick fragments, moist.
10 / 745	3	9-13	NA	NA	3.1	0.0 0.0 0.0 0.0		Brown SILTY CLAY, trace very fine to fine Sand and very fine Gravel, medium soft, medium plasticity, moist. Gray SILT, some Clay and very fine to medium Sand, trace rootlets, no plasticity, moist. Gray olive CLAY, yellow mottled, trace Silt, trace rootlets, little medium to coarse rounded Gravel 11-11.3 ft bgs, stiff, plastic, moist.
	4	13-14.5	NA	NA	1.8	0.0 0.0 0.6		Olive green-gray SILT and CLAY, trace very fine Gravel, brittle, dry. Top of weathered SHALE bedrock at 14.5 ft bgs.
15								Gray broken SHALE fragments and Silt. Wet at 17.5 ft bgs. Competent bedrock at 18.5 ft bgs.



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-4**

Borehole Depth: 40.5' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
740	5	14.5 18.5	NA	NA	0.8	0.8		Gray broken SHALE fragments and Silt. Wet at 17.5 ft bgs. Competent bedrock at 18.5 ft bgs.	Cement-Bentonite Grout (0.3-18.5' bgs)
20	6	18.5 20.5	NA	0	2.0	NA		Dark gray SHALE.	
735	7	20.5 25.5	3.78 min/ft 2.93 min/ft 3.35 min/ft 2.88 min/ft 5.05 min/ft	50	4.2	NA		Dark gray SHALE, medium hard, mechanical break 20.65, 20.72, 21.2, 21.25, 21.34, 21.45, 21.55, 21.70, 21.77, 22.02, 22.5, 22.9, 23.05 ft bgs, horizontal joint 23.2 ft bgs, mechanical break 23.87, 24.3, 24.7 ft bgs, vertical joint 24.0-24.7 ft bgs.	
25									
730	8	25.5 30.5	5.50 min/ft 5.40 min/ft NA NA NA	91.6	5.0	NA		Dark gray SHALE, medium hard, horizontal joint 26.14 ft bgs, broken zone 26.6-26.75 ft bgs, mechanical break 27.88 ft bgs, horizontal joint 28.9 ft bgs, mechanical break 29.65 ft bgs, broken zone 29.7-29.9 ft bgs, mechanical break 30.5 ft bgs.	Open Bedrock Hole (20.5-40.5' bgs) Bedrock Formation
30									
725	9	30.5 35.5	5.48 min/ft 3.12 min/ft 2.82 min/ft 1.35 min/ft NA	100	5.0	NA		Dark gray SHALE, medium hard, horizontal joint 1-2mm wide 31.69 ft bgs, 32.46 ft bgs, horizontal joint 33.05 ft bgs, horizontal joint 1-5mm wide 33.8 ft bgs, mechanical break 34.67-35.07 ft bgs.	
35									
								Dark gray SHALE, medium hard, horizontal joint 35.72 ft bgs, mechanical break	

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-4**

Borehole Depth: 40.5' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
720									
			NA					37.17 ft bgs, horizontal joint 38, 39.5 ft bgs, mechanical break 40.05 ft bgs, broken zone 40.3-40.5 ft bgs.	
			NA						
	10	35.5 40.5	NA	90	5.0	NA			Open Bedrock Hole (20.5-40.5' bgs)
			3.47 min/ft						Bedrock Formation
40			2.77 min/ft						
								End of boring at 40.5' bgs.	
715									
45									
710									
50									
705									
55									

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

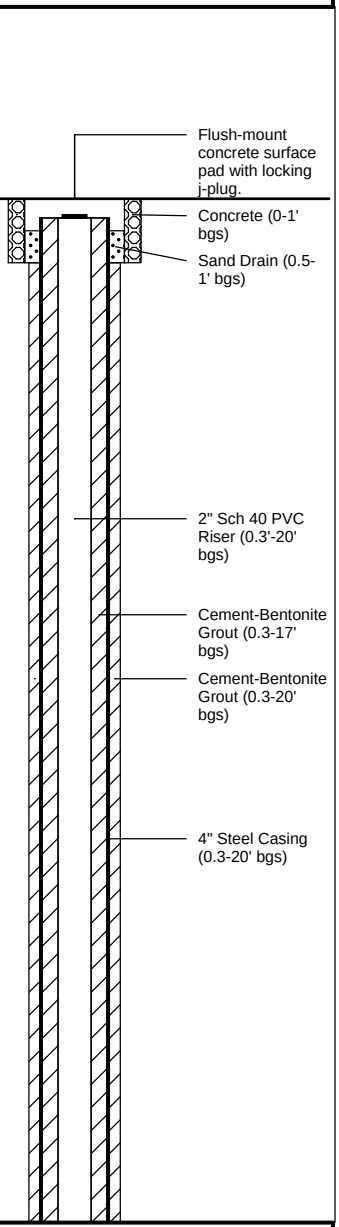
Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Date Start/Finish: August 11-12 and 17-18, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019332.20
Easting: 1353666.43
Casing Elevation: 757.82' AMSL
Borehole Depth: 35.0' bgs
Surface Elevation: 757.63' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: **MW-5**
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
760 /								
0 /								Brown wood mulch.
755 /	1	0-5	NA	NA	NA	0.0		Brown medium to coarse SAND, little rounded to angular medium to coarse Gravel, trace roots, moist.
5								
750 /	2	5-10	NA	NA	1.5	0.0 0.0		Brown fine to coarse SAND and very fine to very coarse rounded GRAVEL, some Silt, moist to wet.
10								
745 /	3	10-14	NA	NA	2.8	1.2 29.6 26.7 5.2		Gray-green CLAY and SILT, trace fine Sand, wood piece at top of interval, coal-tar-like odor, moist. Dark Gray broken ROCK fragments and SILT, some to little Clay, odor, moist. Dark gray-olive SILT, some very fine to coarse angular Gravel, little Clay, moist.
15	4	14-17.5	NA	NA	NA	NA		NO RECOVERY. Top of competent SHALE bedrock at 17.5 ft bgs.



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

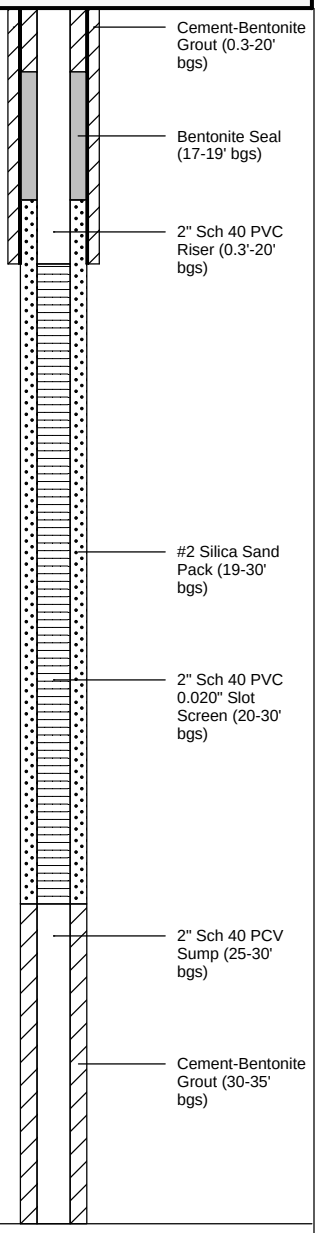
Well/Boring ID: **MW-5**

Borehole Depth: 35.0' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
								NO RECOVERY. Top of competent SHALE bedrock at 17.5 ft bgs.
740	5	17.5-20	NA	0	2.0	NA		Dark gray SHALE, breaks across entire length.
20	6	20-25	3.57 min/ft 3.22 min/ft 3.55 min/ft 2.25 min/ft 3.75 min/ft	43	4.7	NA		Dark gray SHALE, medium hard, horizontal joint with trace oil-like material 20.2 ft bgs, 63-deg joint coated with oil-like material 20.2-20.6 ft bgs, horizontal joint 21.1, 21.2, 21.3 ft bgs, broken zone 21.3-21.4 ft bgs, horizontal joint 21.5 ft bgs, horizontal joint containing little to trace oil-like material 21.73 ft bgs, mechanical break 21.9, 22.0, 22.2, 22.48 ft bgs, horizontal joint 22.9 ft bgs, mechanical break 23.2, 23.35, 24.03, 24.32 ft bgs.
735								
25	7	25-30	5.27 min/ft 4.53 min/ft 4.10 min/ft NA NA	30	4.6	NA		Dark gray SHALE, medium hard, broken zone 25.25-25.4 ft bgs, 15-deg joint 1-3mm wide 25.65 ft bgs, horizontal joint 1-3 mm wide 25.67, 25.9, 2-4mm wide 26.18, 27.5, 26.73, 28.24, 27.9, 28.47, 28.68, 29.05 ft bgs, vertical joint 27.35-28.55 ft bgs.
730								
30	8	30-35	7.02 min/ft 4.42 min/ft 4.75 min/ft 3.87 min/ft 3.12 min/ft	88	4.8	NA		Dark gray SHALE, medium hard, horizontal joint 1-2mm wide, 31.15, 31.95, 1-4mm wide 34 ft bgs, mechanical break 34.38 ft bgs.
725								
35								End of boring at 35' bgs.



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

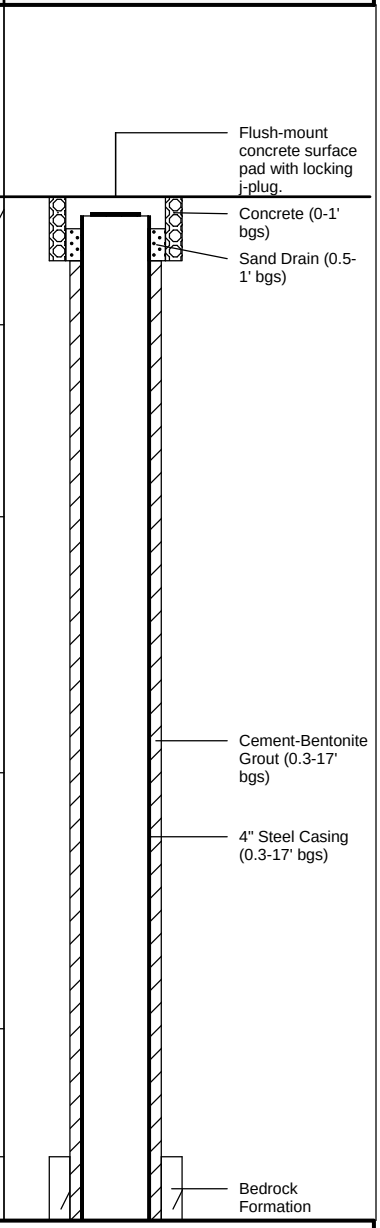
Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Date Start/Finish: August 12 and 18, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019281.30
Easting: 1353655.12
Casing Elevation: 757.73' AMSL
Borehole Depth: 37.0' bgs
Surface Elevation: 757.55' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: **MW-6**
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
760 / 0								
0 / 755						0.0		Brown wood mulch.
								Yellowish brown very fine to medium SAND, little Silt, little fine to coarse Gravel, no plasticity, no dilatancy, dry.
	1	0-5	NA	NA	NA	0.0		Yellowish brown very fine to medium SAND, some medium to coarse subrounded to angular Gravel, trace Silt, dry.
5 / 750	2	5-9	NA	NA	1.8	0.0 0.0 0.0		Gray, brown mottled SILT, little to trace Clay, brittle, dry.
10 / 745	3	9-13	NA	NA	2.3	0.0 0.0 0.0		Gray weathered SHALE bedrock, some to little Silt, brittle, dry.
	4	13-15	NA	NA	1.2	0.0 0.0		Gray weathered SHALE bedrock, brittle, dry. Top of competent SHALE bedrock at 15 ft bgs.
15								Dark gray SHALE, breaks across entire length.



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-6**

Borehole Depth: 37.0' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
	5	15-17	NA	NA	0	NA		Dark gray SHALE, breaks across entire length.	Cement-Bentonite Grout (0.3-17' bgs)
740			4.62 min/ft 4.00 min/ft					Dark gray SHALE, medium hard, horizontal joint 2-3mm wide 17.7, 1-3mm wide 18.04, 1-2mm wide 18.18, 1-2mm wide 18.35, 18.43-18.45, 18.65-18.67 ft bgs, mechanical break 18.82 ft bgs, horizontal joint 1-2mm wide 18.95 ft bgs, mechanical break 19.13 ft bgs, horizontal break 19.5-19.52 ft bgs, mechanical break 20.21, 20.56 ft bgs.	
20	6	17-22	3.25 min/ft 2.15 min/ft 2.12 min/ft	35	3.7	NA			
735			4.15 min/ft 3.95 min/ft					Dark gray SHALE, medium hard, horizontal joint, 22.17, 1-3mm wide 22.46, 22.73, 22.9, 23.69, 24.1 ft bgs, 45-deg joint 23.95-24.4 ft bgs, broken zone 24.7-24.8 ft bgs, horizontal joint 25.4-25.42 ft bgs, mechanical break 26.47 ft bgs.	Open Bedrock Hole (17-37' bgs)
25	7	22-27	5.73 min/ft 4.58 min/ft 5.67 min/ft	73	3.7	NA			Bedrock Formation
730			6.02 min/ft 4.50 min/ft					Dark gray SHALE, medium hard, 45-deg joint 27-27.55 ft bgs, horizontal joint 27.55, 1-2mm wide 28.9, 1-3mm wide 29.75, 30.55, 31 ft bgs, mechanical break 31.45 ft bgs.	
30	8	27-32	4.30 min/ft NA NA	100	5.0	NA			
725			NA NA					Dark gray SHALE, medium hard, horizontal joint with trace calcium-like mineral deposit 32.36 ft bgs, broken zone 32.8-33.2, 33.85-33.95 ft bgs, mechanical break 34.2 ft bgs, horizontal joint 1-3mm wide 35.3 ft bgs, mechanical break 35.9 ft bgs, broken zone 36.8-37 ft bgs.	
35	9	32-37	NA NA	75	5.0	NA			
								Dark gray SHALE, medium hard, horizontal joint with trace calcium-like mineral	

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-6**

Borehole Depth: 37.0' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
			NA					deposit 32.36 ft bgs, broken zone 32.8-33.2, 33.85-33.95 ft bgs, mechanical break 34.2 ft bgs, horizontal joint 1-3mm wide 35.3 ft bgs, mechanical break 35.9 ft bgs, broken zone 36.8-37 ft bgs.	Open Bedrock Hole (17-37' bgs)
								End of boring at 37.0' bgs.	

720
40
715
45
710
50
705
55

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Date Start/Finish: August 11 and 13-14, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019380.35
Easting: 1353503.14
Casing Elevation: 744.07' AMSL
Borehole Depth: 30.5' bgs
Surface Elevation: 743.96' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: MW-7
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
745 / 0									Flush-mount concrete surface pad with locking j-plug.
						7.8		TOPSOIL. Yellowish brown very fine to medium SAND, some Silt, little very fine to medium Gravel, some brick debris, some rootlets, no plasticity, no dilatancy, moist.	Concrete (0-1' bgs); Sand Drain (0.5-1' bgs)
	1	0-5	NA	NA	NA	0.0		Dark brown SILTY CLAY, medium plasticity, no dilatancy, soft, moist.	
740 / 5								Yellowish brown CLAYEY SILT, trace fine Sand, trace Gravel, medium plasticity, no dilatancy, moist.	
	2	5-8.5	NA	NA	3.3	0.0			Cement-Bentonite Grout (0.3-10.5' bgs); 4" Steel Casing (0.3-10.5' bgs)
						0.0		Yellowish brown SILT, little very fine to fine Sand, no plasticity, no dilatancy, loose to medium dense, brittle, dry.	
								Gray weathered SHALE bedrock. Top of competent SHALE bedrock at 8.3 ft bgs.	
735 / 10	3	8.5-10.5	NA	NA	NA	NA		Interval not sampled/logged.	Bedrock Formation
	4	10.5-15.5	10.00 min/ft; 10.00 min/ft; 11.00 min/ft; 10.00 min/ft; 10.00 min/ft	22	4.04	NA		Dark gray SHALE, medium hard, broken zone 10.6-11.2 ft bgs, horizontal joint 13.1, 13.9, 14, 14.4 ft bgs, vertical mechanical joint 12.5-14.7 ft bgs.	Bedrock Formation
730 / 15								Dark gray SHALE, medium hard, horizontal joint 15.7, 16.75, 17.7, 18.45, 19.25, 20.1 ft bgs, 72-deg joint 16-16.65 ft bgs.	

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-7**

Borehole Depth: 30.5' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
20 / 725	5	15.5-20.5	8.00 min/ft 8.50 min/ft 9.50 min/ft 10.00 min/ft 10.00 min/ft	89	4.89	NA		Dark gray SHALE, medium hard, horizontal joint 15.7, 16.75, 17.7, 18.45, 19.25, 20.1 ft bgs, 72-deg joint 16-16.65 ft bgs.	
25 / 720	6	20.5-25.5	8.00 min/ft 10.00 min/ft 11.00 min/ft 11.00 min/ft 9.00 min/ft	93	4.92	NA		Dark gray SHALE, medium hard, horizontal joint 1mm wide 20.83 ft bgs, mechanical break 21.3 ft bgs, horizontal joint with calcium-like mineral deposit 1-2mm wide 21.9, 21.96 ft bgs, mechanical break 23.86, 24.6 ft bgs.	Open Bedrock Hole (10.5-30.5' bgs)
30 / 715	7	25.5-30.5	11.00 min/ft 11.00 min/ft 10.00 min/ft 11.00 min/ft 12.00 min/ft	69	4.71	NA		Dark gray SHALE, medium hard, mechanical break 25.65, 25.9 ft bgs, horizontal joint with calcium-like mineral deposit 1mm wide 26.4, 1-3mm wide 27.65 ft bgs, mechanical break 27.9, 29 ft bgs, 54-deg joint 28.2-28.4 ft bgs.	
35 / 710								End of boring at 30.5' bgs.	

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

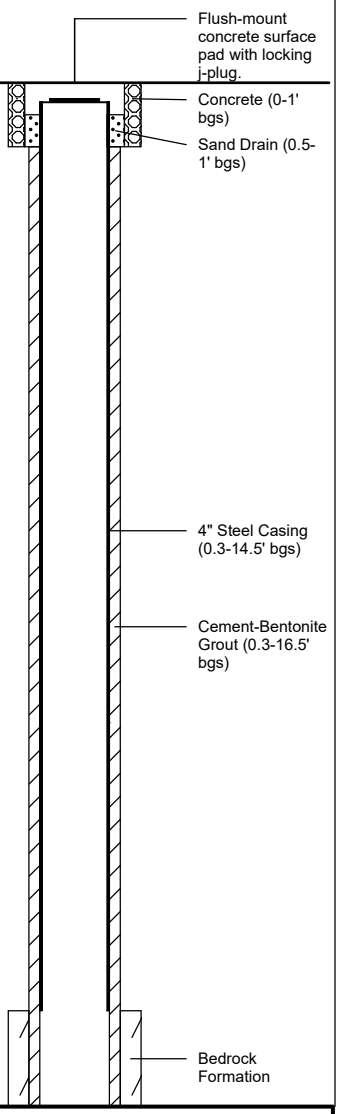
Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Date Start/Finish: October 8-9, 2017
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID/HQ Core Barrel
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing:
Easting:
Casing Elevation: ' AMSL
Borehole Depth: 36.5' bgs
Surface Elevation: ' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: **MW-8**
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0 / 0								
						0.3		Asphalt.
								Gravel road base. Geotech fabric at 1.5 ft bgs.
	1	0-5	NA	NA	NA			Dark SILT, little Clay, little to trace very fine to medium subrounded to subangular Gravel, trace coal fragments, medium to low plasticity, moist.
						0.0		
						0.0		Dark Brown SILT and very fine SAND, little Clay, little to trace very fine subrounded to subangular Gravel, trace Ash, moist.
5 / -5								
						0.0		
	2	5-9	NA	NA	2.9	0.0		Gray SILT and CLAY, trace very fine angular Gravel, trace orange mottling, plastic, moist.
						0.7		
10 / -10						0.0		
	3	9-13	NA	NA	2.4	0.0		Gray weathered SHALE bedrock. Top of competent SHALE bedrock at 14.5 ft bgs.
						0.0		
	4	13-14.5	NA	NA	0.3	0.0		
15 / -15								Dark gray SHALE, medium hard, broken zone 14.5-15.7, 16-16.15 ft bgs, horizontal joint 16.35 ft bgs.
	5	14.5-16.5	NA	31.8	2.2	NA		



ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-8**

Borehole Depth: 36.5' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
									Cement-Bentonite Grout (0.3-16.5' bgs)
	6	16.5-21.5	3.35 min/ft 2.97 min/ft 3.85 min/ft 4.57 min/ft 6.00 min/ft	8	4.6	NA		Dark gray SHALE, medium hard, 10-deg joint 16.73 ft bgs, horizontal joint 16.91, 17.07 ft bgs, mechanical break 17.28 ft bgs, horizontal break 17.5, 17.67, 17.9 ft bgs, broken zone 17.9-18.1 ft bgs, horizontal joint 18.45, 18.55, 18.7, 18.87, 19.0 ft bgs, broken zone 19.15-20.4 ft bgs, mechanical break 20.69 ft bgs, 21.07 ft bgs.	
20 20									
	7	21.5-26.5	4.37 min/ft 5.78 min/ft 6.50 min/ft 7.00 min/ft 4.00 min/ft	58	5.3	NA		Dark gray SHALE, medium hard, horizontal joint 21.8, 21.95, 22.05 ft bgs, broken zone 22.15-22.2 ft bgs, broken zone 22.2-22.9 ft bgs, horizontal joint 23.07, 23.15, 23.32, 23.55, 26 ft bgs, broken zone 26.5-26.8 ft bgs.	Open Bedrock Hole (14.5-36.5' bgs)
25 25									Bedrock Formation
	8	26.5-31.5	9.25 min/ft 9.92 min/ft 6.87 min/ft 6.18 min/ft 8.07 min/ft	81	4.5	NA		Dark gray SHALE, medium hard, broken zone 26.5-26.75 ft bgs, horizontal joint 27.18, 28.29, 28.95 ft bgs, mechanical break 29.77, 29.92, 30.35 ft bgs.	
30 30									
	9	31.5-36.5	11.38 min/ft 8.82 min/ft 7.23 min/ft 8.83 min/ft 6.83 min/ft	93	5.0	NA		Dark gray SHALE, medium hard, mechanical break 32.13 ft bgs, 10-deg joint 32.25 ft bgs, mechanical break 32.98, 33.67, 34.44 ft bgs, 10-deg joint 34.75 ft bgs, horizontal joint 35.65 ft bgs, mechanical break 36.1, 36.5 ft bgs.	
35 35									

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Client: RG&E

Well/Boring ID: **MW-8**

Borehole Depth: 36.5' bgs

Site Location:

6 Park Street,
Geneseo, New York

Depth (ft. bgs) / Elevation (ft. AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
									Bedrock Formation
								End of boring at 36.5' bgs.	Open Bedrock Hole (14.5-36.5' bgs)
40 40									
45 45									
50 50									
55 55									

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA. 4" steel casing set 2 ft into competent bedrock. Open hole bedrock well installed using HQ core barrel.

Date Start/Finish: August 13, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019356.16
Easting: 1353766.74
Casing Elevation: NA
Borehole Depth: 12.9' bgs
Surface Elevation: 759.24' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: **SB-1**
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
760									
0								Asphalt.	Asphalt cold patch (0-0.3' bgs)
								Road base gravel.	
	1	0-5	NA	NA	NA	0.0		Brown fine to coarse SAND and fine to coarse rounded Gravel, little cobbles, some Silt, dry to moist.	
755									
5									
	2	5-9	NA	NA	1.6	0.0 0.0		Dark brown grading to brown SILT and very fine SAND, some-little Clay, trace very fine to medium angular Gravel, low plasticity, soft, dry to moist.	Cement-Bentonite Grout (0.3-12.9' bgs)
750									
10						0.0		Brown SILT and CLAY, orange mottled, medium stiff, no plastic, dry.	
	3	9-12.9	NA	NA	3.8	0.0 0.0		Gray weathered SHALE bedrock, dry. Top of weathered SHALE bedrock at 11 ft bgs.	
								End of boring at 12.9' bgs.	
745									
15									

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA.

Date Start/Finish: August 13, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019292.15
Easting: 1353750.52
Casing Elevation: NA
Borehole Depth: 13.2' bgs
Surface Elevation: 760.19' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: SB-2
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
0 / 760								Asphalt.	Asphalt cold patch (0-0.3' bgs)
								Road base gravel.	
	1	0-5	NA	NA	NA	0.0		Brown coarse SAND and fine to coarse subangular to subrounded GRAVEL, moist.	
								Dark reddish brown SILT, little very fine Sand, trace small to medium subrounded Pebbles, trace brick debris, soft to medium stiff, moist.	
								Dark reddish brown SILT, little very fine Sand, trace small to medium subrounded Pebbles, soft to medium stiff, moist to wet.	
5 / 755						0.3		Brown-gray SILT, trace Clay, little to trace very fine to medium angular Gravel, strong petroleum-like odor 7.5-8.8 ft bgs, stiff, dry.	
						2.1			
	2	5-9	NA	NA	3.8	89.3			Cement-Bentonite Grout (0.3-13.2' bgs)
						372.2			
						1007			
10 / 750						251.9		Weathered SHALE bedrock and rock flour, brittle, faint petroleum-like odor. Competent bedrock at 11 ft bgs.	
	3	9-13	NA	NA	1.5			Dark Gray SHALE bedrock.	
						56.4			
	4	13-13.2	NA	NA	0.1	8.3		End of boring at 13.2' bgs.	
15 / 745									

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA.

Date Start/Finish: August 13, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019287.46
Easting: 1353691.45
Casing Elevation: NA
Borehole Depth: 11' bgs
Surface Elevation: 758.49' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: SB-3
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
760									
0								Asphalt.	Asphalt cold patch (0-0.3' bgs)
								Road base gravel.	
	1	0-5	NA	NA	NA	1.1		Dark gray SILT, some very fine to fine Sand, little small to medium subrounded to subangular Gravel, soft to medium stiff, no plasticity no dilatancy, moist.	
755						2.2		Dark brown SILT, trace very fine to fine Sand, trace Clay, trace subrounded to angular fine to medium Gravel, soft to medium stiff, low to medium plasticity, no dilatancy, moist.	
						2.9		Dark brown fine to coarse SAND, trace subrounded to angular fine to medium Gravel, trace Silt, loose, dry to moist.	
5									
	2	5-9	NA	NA	3.7	0.0		Reddish-dark brown very fine to fine SILTY SAND, little Silt, trace angular to subrounded fine to medium Gravel, dense to very dense, dry.	Cement-Bentonite Grout (0.3-11' bgs)
						0.0		Light brown SILT, medium stiff, brittle, dry.	
750									
10	3	9-11	NA	NA	2.0	0.0		Light gray weathered SHALE bedrock, dry. Top of SHALE bedrock at 11ft bgs.	
								End of boring at 11.0' bgs.	
745									
15									

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA.

Date Start/Finish: August 14, 2015
Drilling Company: Nothnagle Drilling, Inc.
Driller's Name: Steve Loranty
Drilling Method: Hollow Stem Auger/Rock Core
Auger Size: 6-1/4" ID
Rig Type: CME 85 Truck Mounted Rig
Sampling Method: 4' Macrocore

Northing: 1019380.09
Easting: 1353725.34
Casing Elevation: NA
Borehole Depth: 15.2' bgs
Surface Elevation: 758.33' AMSL
Descriptions By: Nicholas (Klaus) Beyrle

Well ID/Boring ID: SB-5
Client: RG&E
Site Location: 6 Park Street, Geneseo, New York

Depth (ft bgs) / Elevation (ft AMSL)	Sample Run Number	Sample/Int/Type	Minutes per Foot	RQD (%)	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well Construction
760									
0								Asphalt.	Asphalt cold patch (0-0.3' bgs)
								Road base gravel.	
	1	0-5	NA	NA	NA	0.0		Brown fine to coarse SAND and SILT, some fine to coarse angular Gravel, trace brick, moist.	
755									
5								Black and brown Slag and SILT, dry to moist.	
						0.0		Brown SILT, little Clay, no plasticity, medium stiff, moist to dry. White calcium-like deposits possibly ash-like material 6.2-7 ft bgs.	
	2	5-9	NA	NA	2.0	0.0			Cement-Bentonite Grout (0.3-15.2' bgs)
750						0.0			
								Dark brown SILT, some very fine Sand, trace very fine angular to rounded Gravel, medium soft, moist.	
10						0.0		Gray CLAY, orange mottled, some Silt, trace very fine angular to rounded Gravel, medium plasticity, stiff, dry to moist. Brittle 11.3-12.6 ft bgs.	
	3	9-13	NA	NA	3.6	0.0			
						0.0		Gray CLAY, orange mottled, some Silt, trace very fine angular to rounded Gravel, brittle, medium plasticity, stiff, dry to moist. Top of weathered Shale bedrock at 13.5 ft bgs.	
745						0.0		Gray weathered SHALE bedrock, brittle.	
	4	13-15.2	NA	NA	2.2	0.0			
15						0.0			
								End of boring at 15.2' bgs.	

ARCADIS
Infrastructure, environment, buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Location hand cleared to 5 ft bgs. Overburden drilled with 6.25" ID HSA.

Appendix C

Report of Activities at LL-Lot, SUNY Geneseo

Geneseo

Department of
Environmental Health & Safety

Thursday, June 26, 2003

Mr. James Craft, Engineering Geologist
New York State Department of Environmental Conservation
Region 8 Office
6274 East Avon - Lima Road
Avon, New York 14414

RE: Report of Activities at LL-Lot, SUNY Geneseo

Dear Jim:

Enclosed please find two copies of a report on the activities conducted at the SUNY Geneseo LL-Lot after discovery of subsurface coal tar at that location on September 11, 2002.

Per our previous discussions, this report also includes photographs taken as these activities progressed and a brief history of the site. During the period 1872 to 1902 a coal gasification plant operated on property immediately adjacent to the LL-Lot.

I may be reached at 585-245-5512 or by email at dalton@geneseo.edu to discuss the contents of the report.

Sincerely,

Kimberly Dalton Ferris
Director, Environmental Health and Safety.

Cc: Levison

Summary of Activities

In November 2001, the State University of New York at Geneseo took ownership of two vacant properties on Park Street in the Village of Geneseo. The location of the properties, identified as 4 Park Street and 6 Park Street, is shown on Figure 1. Shortly after taking ownership design/construction activities were initiated to transform the approximately 0.75 acre parcel into a campus entrance that would include a small park with benches and a parking lot for 50 vehicles. The construction project is identified as State University Construction Fund Project 06312: Park Street Entrance Improvements. The project site is referred to as "LL Lot" and is located as shown on Figure 2.

On September 11, 2002, during final preparation for paving, the contractor, Babcock Enterprises LTD., of 10121 Poags Hole Road, Dansville, noticed a "soft spot". Excavating that area to determine the cause of the problem revealed a stone/brick containment structure approximately 4 feet below ground surface containing a black tarry substance. Wooden planks had been placed atop the structure and fill material placed on top of the planks. Photographs of the discovered tarry material are included in the Photos Section of this document.

The Project Site Inspector, John Villnave of Parrone Engineers, contacted NYSDEC Region 8 to report the discovery of the material. Samples of the tarry material were collected by Mr. Villnave and analyzed by Toxicity Characteristic Leaching Procedures (TCLP) at Paradigm Laboratories. The results of this analysis can be found in Attachment 1.

On September 25, 2002, after receipt of the analytical results, the SUNY Geneseo Environmental Health and Safety Department (EHS) was notified of the discovery of this subsurface material. EHS contacted Dixon Rollins of the Region 8 Office of the NYSDEC on October 4, 2002. Mr. Rollins visited the site the next day.

Following discussions between EHS and Mr. Rollins, it was determined that following sampling to identify constituents, the liquid material would be removed for incineration.

Surrounding soils containing visible contamination would be excavated and sampled for disposal. The walls of the excavation would be sampled and analyzed for identified constituents to determine extent of contamination. Sample results for the sample of tar are included as Attachment 2.

Excavation of the structure and its contents was initiated October 29, 2002. Photographs of the excavation taken immediately after removal of the structure are included in the Photos Section of this document. On November 6, 2002, the structure and its contents were transported for incineration under NYS Hazardous Waste Manifest # NYG1577817 to Ross Incineration Services, Grafton, Ohio. A copy of the manifest, Land Disposal Restriction Notification, and certificate of destruction are included as Attachment 3.

After additional discussions with Mr. Rollins, it was determined that additionally excavated materials were eligible to be managed under NYSDEC TAGM 4061: *Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants* (MGPs). Between November 2002 and February 2003 approximately 800 Tons of contaminated subsurface materials were removed from the site. The materials were incinerated at American ReFuel of Niagara Falls.

The walls of the excavation were sampled as excavation continued. The results of laboratory analyses conducted on these samples were compared to objective level for volatiles published in NYSDEC TAGM 4046 and polycyclic aromatic hydrocarbons (PAHs) published in NYSDEC Records of Decision for other coal tar sites in New York State[1]. When samples indicated the presence of contaminants in excess of these levels or when visible coal tar was encountered, excavation continued. The approximate location of the coal tar structure and the aerial limits of excavation are shown on Figure 3.

[1] Niagara Mohawk Oneida – Sconondaga Street Former MGP Site, 6-33-041, March 2002.
Niagara Mohawk Rome - Kingsley Avenue MGP Site, Site No. 6-33-043, March 2002.
New York State Electric and Gas – Waterville MGP Site, Site No. 7-27-008, January 2002.

On January 10th and 28th and February 3rd, samples were collected from the base and sides of the excavation that, at the time, exceeded 20 feet in depth. Results of laboratory analyses of these samples indicated the objective levels had been met for the majority of constituents. The results of these analyses are summarized below. Laboratory analytical reports are included as Attachment 4.

Table 1
Summary of Subsurface Sampling and Analyses

	Category	Contaminant of Concern	Concentration Range (ppm)	Frequency Meeting Objective Levels	Objective Level (ppm)
Overburden	Semivolatile Organic Compounds (SVOCs)	tPAH	14.399 - 549.71	3 of 4	500*
		cPAH	2.6 - 367.5	3 of 4	10*
	Volatile Organic Compounds (VOCs)	benzene	ND	4 of 4	0.06**
		ethyl benzene	ND	4 of 4	1.5**
		toluene	ND	4 of 4	5.5**
		xylenes (total)	ND	4 of 4	1.2**
	Metals	Cyanide	ND - 4.1	NA	NA
Fractured Bedrock	Semivolatile Organic Compounds (SVOCs)	tPAH	ND - 180.02	6 of 6	500*
		cPAH	ND - 116.5	5 of 6	10*
	Volatile Organic Compounds (VOCs)	benzene	ND - 0.36	5 of 6	0.06**
		ethyl benzene	ND	6 of 6	1.5**
		toluene	ND - 0.224	6 of 6	5.5**
		xylenes (total)	ND - 0.777	6 of 6	1.2**
	Metals	Cyanide	4.1 - 22	NA	NA

* Objective Levels from NYSDEC Records of Decision, MCG Sites.
** Objective Levels from NYSDEC TAGM 4061.

cPAH is an abbreviation for "carcinogenic polycyclic aromatic hydrocarbons", including:

- indeno(1,2,3-cd)pyrene
- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- benzo(k)flouranthene
- chyrsene
- dibenzo(a,h)anthracene

tPAH is an abbreviation for "total polycyclic aromatic hyrdocarbons", including the cPAHs

The Photos section of this document includes pictures collected during the excavation process.

Very little groundwater was encountered during the excavation process. Any groundwater and/or precipitation collected in the excavation was pumped into a holding tank maintained at the site. On May 2nd and 5th , the liquid materials were transported from the site under Hazardous Waste Manifests #NYG2887056 and NYG3371535, respectively (included as Attachments 5 and 6). The total of approximately 3,200 gallons of materials were thermally treated at CECOS International, Niagara Falls, NY.

On January 10, 2003, Mr. Jim Craft of the NYSDEC Region 8 Office visited the site. After consultation with Mr. Craft, the decision was made to terminate excavation activities prior to the arrival of students for the spring semester due to the physical hazard created by the deep excavation. Structural fill was placed into the 20+ foot excavation and compacted.

During the excavation process, material that did not contain visible contamination was placed on bermed plastic on a paved portion of the site and covered. This material was originally intended to be returned to the excavation as structural fill. The material was later determined to be structurally unsuitable and required off-site disposal. During the week of May 8, 2003, this 200 Tons of excavated material was transported to BFI – Niagara Recycling in Niagara Falls, NY for landfilling.

Site History:

According to Mr. David Parish, Village and Town of Geneseo Historian, and other persons involved in tracing Geneseo history, the LL-Lot site was in the immediate vicinity of the Electric Power Plant for the Village of Geneseo, which operated during the early 1900s. The building that housed the coal-powered plant is immediately north of the site and currently houses the Sundance Bookstore (not affiliated with SUNY Geneseo). The location of this building is shown on Figure 4. The "Electrical Light Station," as the power plant was referred to, opened in 1902. The Village of Geneseo Gasworks

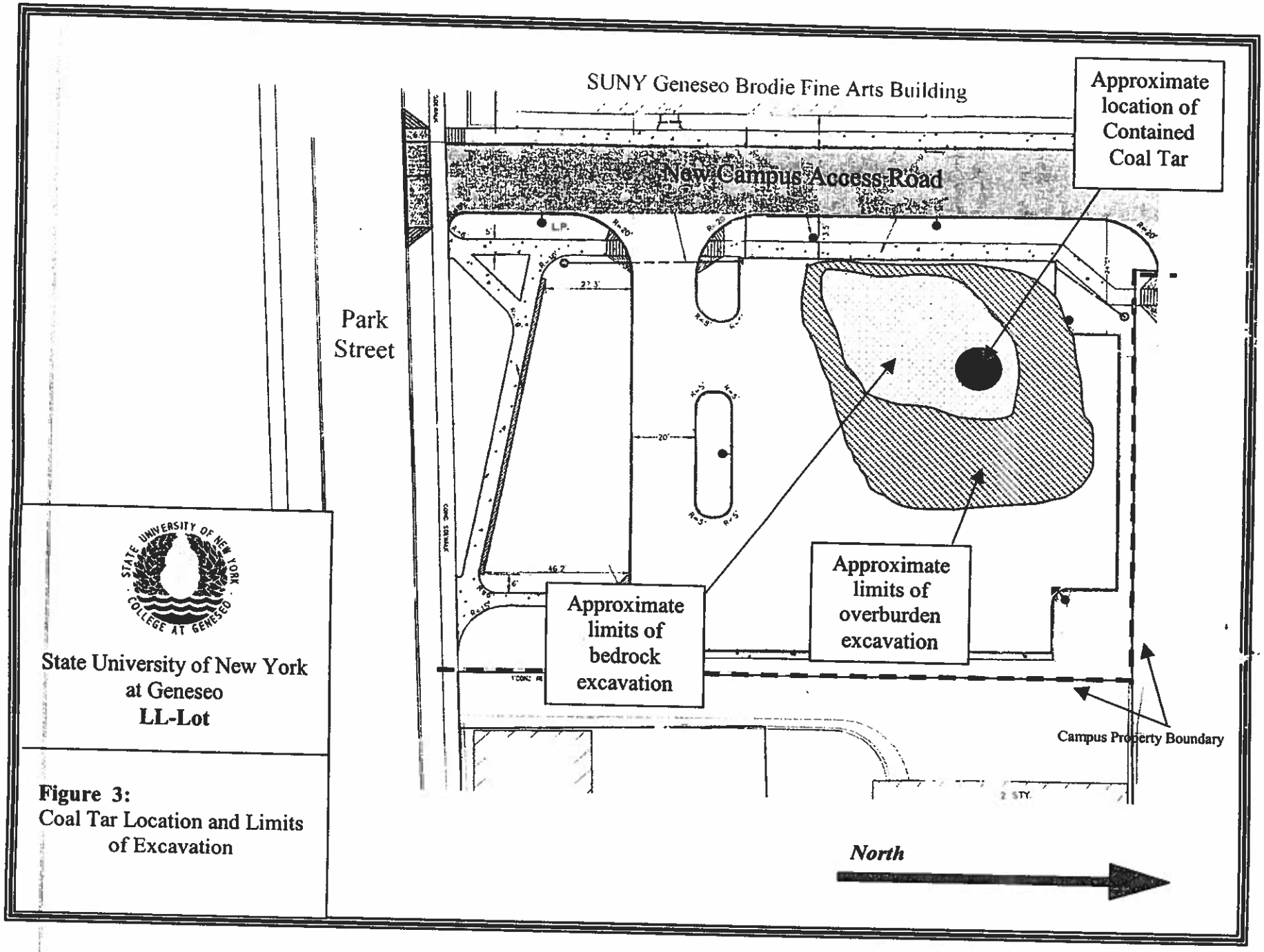
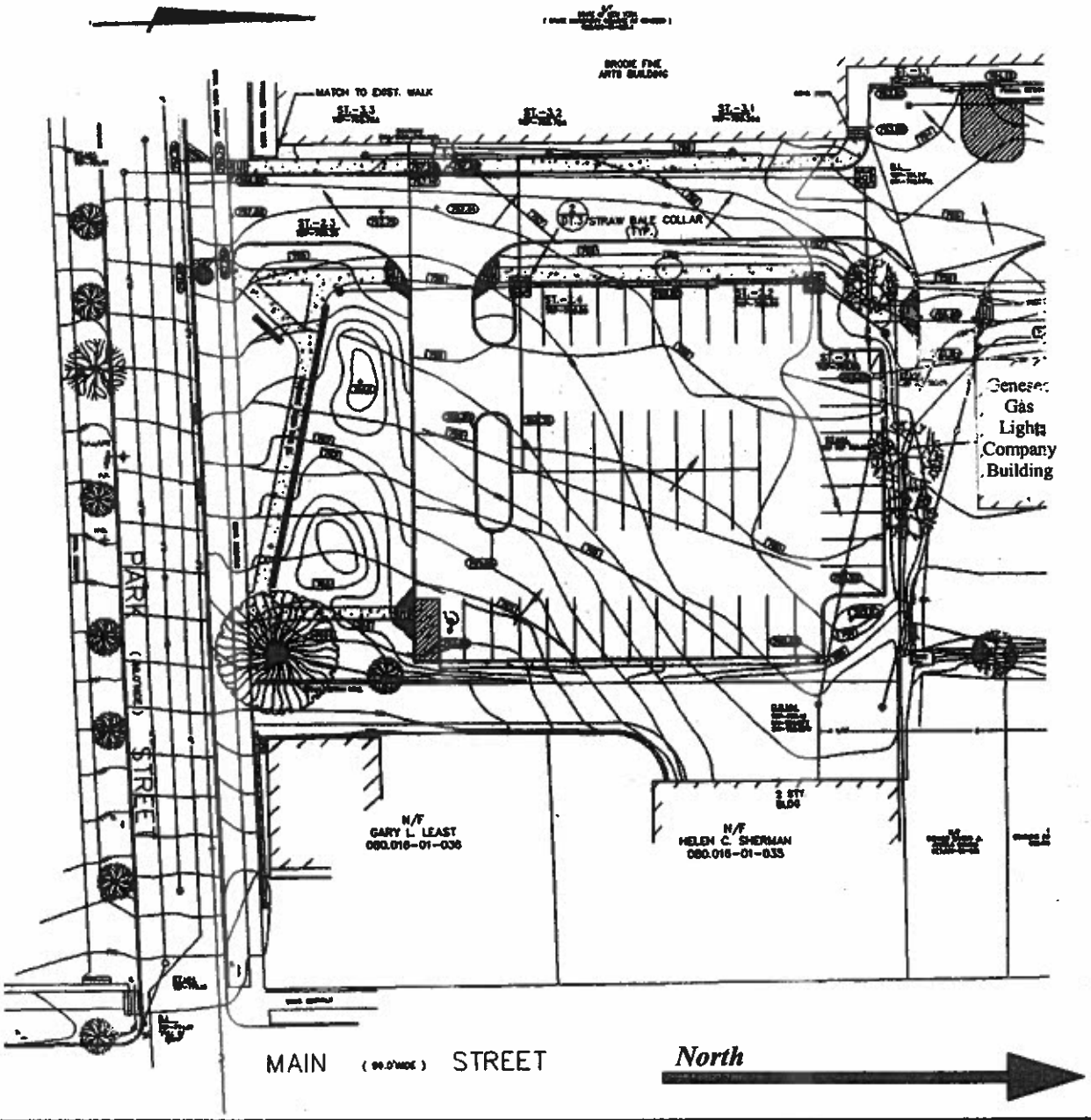


Figure 3:
Coal Tar Location and Limits of Excavation



State University of New York
at Geneseo
LL-Lot

Figure 4:
Surface Contour Map

Wooden Planking

Metal Pole used as attempt to determine depth of material (2 – 3 feet)

Photo 1: 9/26/02
Coal Tar at time of discovery.

Metal Pipe containing coal tar.
Approx. 4" OD.
Removed.

Photo 2: 9/26/02
Coal Tar at time of discovery.

Photo 3: 10/29/02
Excavation following removal of containment structure

Metal conduit installed by previous owners – later removed/disposed

Photo 4: 10/29/02
Excavation following removal of containment structure

Photo 5: 11/01/02
Excavation following removal of containment structure

Photo 6: 1/06/03
Walls of excavation - overburden

Photo 7: 12/30/02
West excavation wall

Photo 8: 12/31/02
Excavation

Photo 9: 1/16/03
Excavation Maximum Depth – Looking South

Photo 10: 1/16/03
Excavation Maximum Depth – Looking East

Building that housed Geneseo Gas Light Company and coal-fired Electrical Power Plant

SUNY Geneseo Brodie Fine Arts Building

Photo 11: 5/27/03
LL-Lot looking Northwest

Previous location of excavated coal tar structure (approximate)

New campus access road

Photo 12: : 5/27/03
LL-Lot looking North from Park Street

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: SUNY Geneseo

Client Job Site: Parking Lot

Client Job No.: N/A

Lab Project No.: 02-2367

Sample Type: Sludge
Method: SW846 1010

Date(s) Sampled: 9/17/02
Date Received: 9/17/02
Date Analyzed: 9/19/02

ATTACHMENT 1

Laboratory Report for Flashpoint Analyis

Lab Sample No.	Field ID No.	Field Location	Flashpoint Results (°C)
8546	N/A	Tar Mix	>70

ELAP ID No.: 10958

Comments:

Approved By: _____
Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information.

File ID:022367.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: SUNY Geneseo

Client Job Site: Parking Lot

Client Job No.: N/A

Lab Project No.: 02-2367

Sample Type: Sludge
Method: SW846 9045C

Date(s) Sampled: 9/17/02
Date Received: 9/17/02

Date Analyzed: 9/18/02

Laboratory Report for pH Analysis

Lab Sample No.	Field ID No.	Field Location	pH Results (S.U.)
8546	N/A	Tar Mix	6.57

ELAP ID No.: 10958

Comments:

Approved By: _____
Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information.

File ID:022367.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: SUNY Geneseo

Client Job Site: Parking Lot

Client Job No.: N/A

Lab Project No.: 02-2367

Sample Type: Sludge
Method: SM17 2540B

Date(s) Sampled: 9/17/02
Date Received: 9/17/02
Date Analyzed: 9/17/02

Laboratory Report for Percent Solids Analysis

Lab Sample No.	Field ID No.	Field Location	Percent Solids (%)
8546	N/A	Tar Mix	98.4

ELAP ID No.: 10958

Comments:

Approved By: _____
Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information.

File ID:022367.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: SUNY Geneseo

Client Job Site: Parking Lot

Client Job No.: N/A

Lab Project No.: 02-2367

Sample Type: Sludge
Method: SW846 9095

Date(s) Sampled: 9/17/02
Date Received: 9/17/02
Date Analyzed: 9/20/02

Laboratory Report for Paint Filter Analysis

Lab Sample No.	Field ID No.	Field Location	Paint Filter Test Result (Pass/Fail)
8546	N/A	Tar Mix	Fail

ELAP ID No.: 10958

Comments: Pass = No Free Liquids

Approved By: _____
Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information.

File ID: 022367.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

LABORATORY REPORT OF ANALYSIS

Client: SUNY Geneseo

Client Job Site: Parking Lot
Client Job No.: N/A

Field Location: Tar Mix

Lab Project No.: 02-2367
Lab Sample No.: 8546

Sample Type: Solid

Date Sampled: 09/17/2002
Date Received: 09/17/2002

Parameter	Date Analyzed	Analytical Method	Result (mg/kg)
Cyanide Reactivity	09/24/2002	SW846, 7.3	ND<1 Non Reactive
Sulfide Reactivity	09/24/2002	SW846, 7.3	56 Non Reactive

ELAP ID. No.: 10709

Comments: ND denotes Non Detected.
Hazardous Waste Regulatory Levels for Reactivity are as follows:
Sulfide - 500 mg/kg, Cyanide - 250 mg/kg.

Approved By Technical Director: _____

Bruce Hoogesteger

Chain of Custody provides additional sample information.

File ID: Reac02-2367

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: SUNY Geneseo
Client Job Site: Parking Lot
Client Job No.: N/A
Field Location: Tar Mix
Field ID No.: N/A

Lab Project No.: 02-2367
Lab Sample No.: 8546
Sample Type: TCLP Extract
Date Sampled: 09/17/2002
Date Received: 09/17/2002

Laboratory Report for TCLP Metals Analysis

Parameter	Date Analyzed	Analytical Method	Result (mg/L)	Regulatory Limit (mg/L)
TCLP Metal Series				
Arsenic	09/20/2002	EPA 6010	<0.100	5.0
Barium	09/20/2002	EPA 6010	0.190	100.0
Cadmium	09/20/2002	EPA 6010	<0.025	1.0
Chromium	09/20/2002	EPA 6010	<0.050	5.0
Lead	09/20/2002	EPA 6010	<0.100	5.0
Mercury	09/20/2002	EPA 7470	<0.0020	0.2
Selenium	09/20/2002	EPA 6010	<0.100	1.0
Silver	09/20/2002	EPA 6010	<0.050	5.0

ELAP ID No.: 10958

Comments:

Approved By: _____
Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information.

File ID:022367.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile Analysis Report for TCLP Extract

Client: SUNY Geneseo

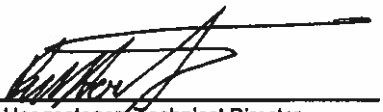
Client Job Site:	Parking Lot	**Lab Project Number:**	02-2367
		Lab Sample Number:	8546
Client Job Number:	N/A		
Field Location:	Tar Mix	**Date Sampled:**	09/17/2002
Field ID Number:	N/A	**Date Received:**	09/17/2002
Sample Type:	TCLP Extract	**Date Analyzed:**	09/25/2002

Base / Neutrals	Results in ug / L	Regulatory Limits in ug / L
1,4-Dichlorobenzene	ND< 2,000	7,500
2,4-Dinitrotoluene	ND< 2,000	130
Hexachlorobenzene	ND< 2,000	3,000
Hexachlorobutadiene	ND< 2,000	500
Hexachloroethane	ND< 2,000	130
Nitrobenzene	ND< 2,000	2,000
Pyridine	7,710	5,000

Acids	Results in ug / L	Regulatory Limits in ug / L
Cresols (as m,p,o-Cresol)	142,000	200,000
Pentachlorophenol	ND< 5,000	100,000
2,4,5-Trichlorophenol	ND< 5,000	400,000
2,4,6-Trichlorophenol	ND< 2,000	2,000

ELAP Number 10958 Method: EPA 8270C Data File: 8815.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature: 

Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information

File ID: 022367S2.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

PCB Analysis Report for Soils/Solids/Sludges

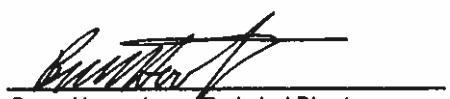
Client: SUNY Geneseo

Client Job Site:	Parking Lot	**Lab Project Number:**	02-2367
		Lab Sample Number:	8546
Client Job Number:	N/A		
Field Location:	Tar Mix	**Date Sampled:**	09/17/2002
Field ID Number:	N/A	**Date Received:**	09/17/2002
Sample Type:	Solid	**Date Analyzed:**	09/24/2002

PCB Identification	Results in mg / Kg
Aroclor 1016	ND< 0.406
Aroclor 1221	ND< 0.406
Aroclor 1232	ND< 0.406
Aroclor 1242	ND< 0.406
Aroclor 1248	ND< 0.406
Aroclor 1254	ND< 0.406
Aroclor 1260	ND< 0.406

ELAP Number 10958 Method: EPA 8082

Comments: ND denotes Non Detect
mg / Kg = milligram per Kilogram

Signature: 
Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information

File ID: 022367P1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for TCLP Extract

Client: SUNY Geneseo

Client Job Site:	Parking Lot	**Lab Project Number:**	02-2367
		Lab Sample Number:	8546
Client Job Number:	N/A		
Field Location:	Tar Mix	**Date Sampled:**	09/17/2002
Field ID Number:	N/A	**Date Received:**	09/17/2002
Sample Type:	TCLP Extract	**Date Analyzed:**	09/21/2002

TCLP Analytes	Results in ug / L	Regulatory Limits in ug / L
Benzene	19,600	500
2-Butanone	ND< 500	200,000
Carbon tetrachloride	ND< 200	500
Chlorobenzene	ND< 200	100,000
Chloroform	ND< 200	6,000
1,2-Dichloroethane	ND< 200	500
1,1-Dichloroethene	ND< 200	700
Tetrachloroethene	ND< 200	700
Trichloroethene	ND< 200	500
Vinyl Chloride	ND< 200	200

ELAP Number 10958 Method: EPA 8260B Data File: 61821.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 022367V1.XLS

PARADIGM
Environmental Services, Inc.
179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716- 647-3311

TCLP Herbicides

Client:	SUNY Geneseo	**Lab Project No:**	02-2367
		Lab Sample No:	8546
Client Job Site:	Parking Lot	**Sample Type:**	TCLP Extract
Client Job No:	N/A	**Date Sampled:**	09/17/2002
Field Location:	Tar Mix	**Date Received:**	09/17/2002
Field ID No:	N/A	**Date Analyzed:**	09/20/2002

Parameter	Result UG/L	Reporting Limit UG/L	Regulatory Limit UG/L
2,4-D	ND	2000	10,000
2,4,5-TP (Silvex)	ND	200	1,000

Analytical Method: EPA 8151 ELAP ID. No.: 10709

Comments: ND denotes Non Detected.

Approved By: _____
Bruce Hoogesteger, Technical Director

The Chain of Custody provides additional information.

File ID:TCLPHERB02-2367

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Pesticide Analysis Report for TCLP Extracts

Client: SUNY Geneseo

Client Job Site:	Parking Lot	**Lab Project Number:**	02-2367
		Lab Sample Number:	8546
Client Job Number:	N/A		
Field Location:	Tar Mix	**Date Sampled:**	09/17/2002
Field ID Number:	N/A	**Date Received:**	09/17/2002
Sample Type:	TCLP Extract	**Date Analyzed:**	09/24/2002

Pesticide	Results in ug / L	Regulatory Limits in ug / L
gamma-BHC (Lindane)	ND< 1.00	400
Chlordane	ND< 1.00	30
Endrin	ND< 1.00	20
Heptachlor	ND< 1.00	8
Heptachlor Epoxide	ND< 1.00	8
Methoxychlor	ND< 1.00	10,000
Toxaphene	ND< 50.0	500

ELAP Number 10958 Method: EPA 8081A

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 022367P2.XLS

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

Columbia Analytical Services, Inc.
An Employee-Owned Company
www.caslab.com

One Mustard St., Suite 250 • Rochester, NY 14609-0859 • (716) 288-5380 • 800-695-7222 x11 • FAX (716) 288-8475

PAGE 1 OF 1

SR #

CAS Contact

Project Name: Geneseo Parking Lot
Project Number: 02-2367
Project Manager: Bob Lyon
Report CC: Parrone Eng.
Company/Address: SUNY @ Geneseo, #1 College Circle, Geneseo, N.Y. 14454
Phone #: 585-245-5511
FAX#:
Sampler's Signature: X John Villnave
Sampler's Printed Name: X JOHN VILLNAVE

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE: 0 | 0 | 0 | 0

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐8260 ☐624 ☐CLP	GC/MS SVOA's ☐8270 ☐625 ☐CLP	GC VOA's ☐8021 ☐601/602	PESTICIDES/PCB's ☐8081 ☐608 ☐CLP ☒8082	STARS LIST 8021 VOA's ☐TOTAL ☐TCLP	STARS LIST 8270 SVOA's ☐TOTAL ☐TCLP	TCLP ☒METALS ☐VOA's ☐SVOA's	WASTE CHARACTERIZATION ☒TH/P ☐React ☐Corros. ☒Ignit.	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	% Solids	PFT	REMARKS/ ALTERNATE DESCRIPTION
TAR MIX		09/17/02	0900	SD	3			X			X	X			X	X		# 8270

Preservative Key: 0. NONE 1. HCL 2. HNO_3 3. H_2SO_4 4. NaOH 5. Zn. Acetate 6. MeOH 7. $NaHSO_4$ 8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

Copy Report to: fax # 586-6752
Mr. John Villnave
Parrone Eng.
400 Whitney Rd.
Penfield, N.Y.
14526

Brad Herman

Jeff Kaplan - SUNY @ Geneseo

Brad Herman phone 586-0200

See QAPP ☐

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 24 hr ____ 48 hr ____ 5 day
X STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
X I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Speicalized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO#
BILL TO: SUNY Geneseo
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: 20°C
CUSTODY SEALS: Y (N)

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: X John Villnave	Signature: Val Miller	Signature: Val Miller	Signature: Rene Dalaia	Signature:	Signature:
Printed Name: JOHN VILLNAVE	Printed Name: V. Miller	Printed Name: V Miller	Printed Name: Rene J. Dalaia	Printed Name:	Printed Name:
Firm:	Firm: CAS	Firm: CAS	Firm: Paradigm	Firm:	Firm:
Date/Time: 09/17/02 1200	Date/Time: 9/17/02 @ 1200	Date/Time: 9/17/02 @ 1400	Date/Time: 9-17-02 1500	Date/Time:	Date/Time:

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

LABORATORY REPORT OF ANALYSIS

Client: NYE Tech
Client Job Site: SUNY Genese Parking Lot
Client Job No.: N/A

ATTACHMENT 2

Lab Project No.: 02-2632
Sample Type: Sludge
Analytical Method: EPA 9012
Date Sampled: 10/15/2002
Date Received: 10/15/2002
Date Analyzed: 10/24/2002

Lab Sample ID.	Sample Location/Field ID	Total Cyanide (mg/kg)
10253	S-1 Pit	4.2

ELAP ID No. 10709

Comments: ND denotes Non-Detected.

Approved By Technical Director: _____
Bruce Hoogesteger

Chain of Custody provides additional sample information.

File ID: TCyanide022632.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

LABORATORY REPORT OF ANALYSIS

Client: NYE Tech

Client Job Site: SUNY Geneseo Parking Lot

Client Job No.: N/A

Lab Project No.: 02-2632

Sample Type: Water
Analytical Method: EPA 335.3
Date Sampled: 10/15/2002
Date Received: 10/15/2002
Date Analyzed: 10/24/2002

Lab Sample ID.	Sample Location/Field ID	Total Cyanide (mg/l)
10254	Field Blank	ND<0.01

ELAP ID No. 10709

Comments: ND denotes Non-Detected.

Approved By Technical Director: _____
Bruce Hoogesteger

Chain of Custody provides additional sample information.

File ID: TCyanide022632p2.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYE Tech

Client Job Site:	SUNY Geneseo Parking Lot	**Lab Project Number:**	02-2632
		Lab Sample Number:	10253
Client Job Number:	N/A		
Field Location:	S-1 Pit	**Date Sampled:**	10/15/2002
Field ID Number:	N/A	**Date Received:**	10/15/2002
Sample Type:	Tar	**Date Analyzed:**	10/21/2002

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 8,470,000
Anthracene	ND< 8,470,000
Benzo (a) anthracene	ND< 8,470,000
Benzo (a) pyrene	ND< 8,470,000
Benzo (b) fluoranthene	ND< 8,470,000
Benzo (g,h,i) perylene	ND< 8,470,000
Benzo (k) fluoranthene	ND< 8,470,000
Chrysene	ND< 8,470,000
Dibenz (a,h) anthracene	ND< 8,470,000
Fluoranthene	14,000,000
Fluorene	ND< 8,470,000
Indeno (1,2,3-cd) pyrene	ND< 8,470,000
Naphthalene	58,400,000
Phenanthrene	23,500,000
Pyrene	10,900,000
Pyridine	ND< 8,470,000

ELAP Number 10958 Method: EPA 8270C Data File: 9032.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 022632s2.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi -Volatile STARS Analysis Report for Non-potable Water

Client: NYE Tech

Client Job Site:	SUNY Geneseo Parking Lot	**Lab Project Number:**	02-2632
		Lab Sample Number:	10254
Client Job Number:	N/A		
Field Location:	Field Blank	**Date Sampled:**	10/15/2002
Field ID Number:	N/A	**Date Received:**	10/15/2002
Sample Type:	Water	**Date Analyzed:**	10/21/2002

Base / Neutrals	Results in ug / L
Acenaphthene	ND< 10.0
Anthracene	ND< 10.0
Benzo (a) anthracene	ND< 10.0
Benzo (a) pyrene	ND< 10.0
Benzo (b) fluoranthene	ND< 10.0
Benzo (g,h,i) perylene	ND< 10.0
Benzo (k) fluoranthene	ND< 10.0
Chrysene	ND< 10.0
Dibenz (a,h) anthracene	ND< 10.0
Fluoranthene	ND< 10.0
Fluorene	ND< 10.0
Indeno (1,2,3-cd) pyrene	ND< 10.0
Naphthalene	ND< 10.0
Phenanthrene	ND< 10.0
Pyrene	ND< 10.0
Pyridine	ND< 10.0

ELAP Number 10958 Method: EPA 8270C Data File: 9030.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 022632S1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYE Tech

Client Job Site:	SUNY Geneseo Parking Lot	**Lab Project Number:**	02-2632
		Lab Sample Number:	10253
Client Job Number:	N/A		
Field Location:	Pit	**Date Sampled:**	10/15/2002
Field ID Number:	S-1	**Date Received:**	10/15/2002
Sample Type:	Tar	**Date Analyzed:**	10/17/2002

Aromatics	Results in ug / Kg
Benzene	285,000
Ethylbenzene	ND< 20,400
Toluene	206,000
m,p-Xylene	111,000
o-Xylene	34,800

ELAP Number 10958 Method: EPA 8021B (GC/MS) Data File: 12573.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 022632V1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Non-potable Water

Client: NYE Tech

Client Job Site:	SUNY Geneseo Parking Lot	**Lab Project Number:**	02-2632
		Lab Sample Number:	10254
Client Job Number:	N/A		
Field Location:	Field Blank	**Date Sampled:**	10/15/2002
Field ID Number:	N/A	**Date Received:**	10/15/2002
Sample Type:	Water	**Date Analyzed:**	10/17/2002

Aromatics	Results in ug / L
Benzene	ND< 0.700
Ethylbenzene	ND< 2.00
Toluene	ND< 2.00
m,p-Xylene	ND< 2.00
o-Xylene	ND< 2.00

ELAP Number 10958 Method: EPA 8021B (GC/MS) Data File: 12574.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 * (800) 724-1997
FAX: (585) 647-3311

CHAIN OF CUSTODY

REPORT TO:
COMPANY: NYETECH
ADDRESS:
CITY: STATE: ZIP:
PHONE: 436-5660 FAX: 436-6139
ATTN: FRANK BOOHER

INVOICE TO:
COMPANY:
ADDRESS:
CITY: STATE: ZIP:
PHONE: FAX:
ATTN:

LAB PROJECT #: 02-2632
CLIENT PROJECT #:

TURNAROUND TIME: (WORKING DAYS)
☐ 1 ☐ 2 ☐ 3 ☒ STD 5 ☐ OTHER

PROJECT NAME/SITE NAME: SUNY GENESEO PARKING LOT

COMMENTS: TECH SITE VISIT cell # 346-4488

REQUESTED ANALYSIS

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	PAH (8270)	BTEX	TCN	PYRIDINE (8N)						REMARKS	PARADIGM LAB SAMPLE NUMBER
1	10/15/02	1030		X	S-1 PIT		2	X	X	X	X							102534
2					FIELD BLANK		4	X	X	X	X							102547
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

****LAB USE ONLY****

SAMPLE CONDITION: Check box if acceptable or note deviation: CONTAINER TYPE: ☐ PRESERVATIONS: ☐ HOLDING TIME: ☐ TEMPERATURE: ☐ 17°C

Sampled By: Date/Time: 10/15/02 1030
Relinquished By: Date/Time: 10/15/02 1210
Received By: Date/Time:

Relinquished By: Date/Time:
Received By: Date/Time:
Received @ Lab By: Date/Time: 10/15/02 1720

Total Cost:
P.I.F.

NYG1577817

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Please type or print. Do not staple

(Hazardous Waste Manifest 1/5/99)

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Doc. No.	2. Page 1 of	Information within heavy bold line is not required by Federal Law.
NYD073693507781 7		1	

3. Generator's Name and Mailing Address: SUNY GENESEO
1 COLLEGE CIRCLE
GENESEO NY 14454

4. Generator's Telephone Number: (585) 245-5511

A. NYG 1577817

B. Generator's ID: SAME

5. Transporter 1 (Company Name)	6. US EPA ID Number	C. State Transporter's ID: 55 79036 NY
PRICE TRUCKING	NYD046765574	D. Transporter's Telephone: (716) 822-1414
7. Transporter 2 (Company Name)	8. US EPA ID Number	E. State Transporter's ID
Robbie D. WOOD	ALD067138891	F. Transporter's Telephone ( )
9. Designated Facility Name and Site Address	10. US EPA ID Number	G. State Facility ID
ROSS INCINERATION SERVICES, 36790 GILES ROAD GRAFTON OH 44044	OHD048415665	H. Facility Telephone: (800) 878-7677

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers Number	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
GENERATOR a. *WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (BENZENE), 9, UN3077, PGIII	001	CM	29900	P	EPA D018
		C	40 0 0 2 0		STATE
b.					EPA
					STATE
c.					EPA
					STATE
d.					EPA
					STATE

ATTACHMENT 3

J. Additional Descr

K. Handling Codes for Wastes Listed Above: a. S02 b. c. d.

15. Special Handling Instructions and Additional Information: IN CASE OF EMERGENCY: (585) 436-5660
ERG 171
R3954 / PO#31829

Profile LDR on file

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Mo.	Day	Year
JEFFREY KAKAW		11	06	02

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Mo.	Day	Year
THOMAS PRICE		11	06	02

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Mo.	Day	Year
Elijah McLin	Elijah McLin	11	08	02

FACILITY

19. Discrepancy Indication Space: SECTIONS 12, 13, 14 UPDATED WITH GENERATOR PERMISSION T. SPARROW (RESI)

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Mo.	Day	Year
Brian Slak		11	11	02

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the NYS Department of Environmental Conservation (518) 457-7362

COPY 1—Disposer State—Mailed by TSD Facility

SA-105374

NOTIFICATION OF WASTE SUBJECT TO LAND DISPOSAL RESTRICTIONS

Page 1 of
Revised 11/98
Manifest #
Shipper
U.S. EPA ID#

Generator: STATE UNIVERSITY OF NEW YORK
Address:
Phone:

1. The generator named above hereby provides the following NOTIFICATION to Ross Incineration Services, Inc. (RIS) as required by 40 CFR 268.7(a)(2) and the OAC/745-59-07(A)(2). The waste material shipped under the above manifest document number is subject to Land Disposal Restriction regulations as set forth in 40 CFR 268 Subpart D/OAC/745-59.

2. Check all UNDERLYING HAZARDOUS CONSTITUENTS (UHC's), on the attached form, which can reasonably be expected to be present in the waste at a concentration above the constituent specific treatment standard listed in 40 CFR Part 268.48, table UTS - Universal Treatment Standards. UHC's must be identified for D001 (if not treated by CMBST or RORGS), D002, D003 (except reactive cyanides and unstabilized carbamate subcategories), D004-D011 (specific subcategories) and D012-D043. Wastewater forms of D012-D043 do not require that UHC's be identified.

   Check all F001-F005 REGULATED HAZARDOUS CONSTITUENTS (RHC'S) which can be reasonably expected to be present in this waste at a concentration above the constituent specific treatment standard listed in 40 CFR Part 268.48.

3. A separate page must be used for each WAS in which RHC's or UHC's are present.

4. Waste Analysis is attached where available, otherwise, the information contained herein is based upon my thorough knowledge of the waste(s).

UNDERLYING HAZARDOUS CONSTITUENTS

Aldicarb sulfone	Hexachlorodibenzo-p-dioxins	Physostigmine
Barban	HxCDFs(All Hexachlorodibenzofurans)	Physostigmine salicylate
BUSAN	2-Iodo-2-propynyl n-butylcarbamate	Propoxur
Carbofuran phenol	Methiocarb	Prosulfocarb
Carbosulfan	Methomyl	Prosulfuron
m-Cumenyl methylcarbamate	Mexacarbate	PCDDs(All Tetrachlorodibenzo-p-dioxins)
Cyclosarin	Nitrapyrin	PCDFs(All Tetrachlorodibenzofurans)
DFP	Oxamyl	Thiophanate-methyl
Famotamine hydrochloride	Phenmedipham	Triethylamine
	Promecarb	tris-(2,3-Dibromopropyl) phosphate
	PeCDDs(All Pentachlorodibenzo-p-dioxins)	Vernolate
	PeCDFs(All Pentachlorodibenzofurans)	Warfarin & salts, when present at concentrations greater than 0.3%

(X) THE ABOVE UNDERLYING HAZARDOUS CONSTITUENTS ARE NOT "REASONABLY EXPECTED" TO BE PRESENT IN THE WASTE PRODUCT STREAMS LISTED IN WASTES SUBJECT TO TREATMENT.

ROSS INCINERATION SERVICES, INC. CANNOT ACCEPT WASTE WITH THESE UNDERLYING HAZARDOUS CONSTITUENTS WITHOUT SPECIAL APPROVALS. PLEASE CONTACT YOUR ACCOUNT REPRESENTATIVE IF APPROVALS ARE NEEDED.

WASTES SUBJECT TO TREATMENT

Nonwastewater(NW) Wastewater(WW)

WAS #	Treatability Group	Code	EPA Codes & Subcategory(if applicable)	Are UHC's & RHC's present?
				YES NO

Signature X _____ Date 11/13/02

Name Jeffrey Lapkin Title Director Facilities Planning & Construction

It is the generator's responsibility under 40 CFR 268/OAC/745-59 to ensure that appropriate notifications accompany each shipment of waste as required. RIS makes no representations as to the accuracy of this form and recommends that the generator independently verify notification requirements for the waste streams.

11/13/2002 08:19AM

Universal Treatment Standards 40 CFR 268.48

Manifest: WPSK: 50011 Page __ of __

INSTRUCTIONS: This page needs completion only if "YES" is indicated under wastes Subject to Treatment section.

Indicate with an "X" any underlying Hazardous Constituent reasonably expected to be present in this waste.

Constituents by Chemical Name	NW Conc.	NNW Conc.	Constituents by Chemical Name	NW Conc.	NNW Conc.	Constituents by Chemical Name	NW Conc.	NNW Conc.
Acenaphthene	0.059	3.4	1,1-Dichloroethylene	0.025	6.0	o-Nitroaniline	0.27	14
Acenaphthylene	0.059	3.4	trans-1,2-Dichloro-ethylene	0.054	30	p-Nitroaniline	0.028	28
Acetone	0.28	160				Nitrobenzene	0.068	14
Acetonitrile	5.6	38	2,4-Dichlorophenol	0.044	14	o-Nitrophenol	0.028	13
Acetophenone	0.010	9.7	2,6-Dichlorophenol	0.044	14	p-Nitrophenol	0.12	29
2-Acetylaminofluorene	0.059	140	2,4-D[2,4-Dichloro-phenoxyacetic Acid	0.72	10	N-Nitrosodi-n-butylamine	0.40	17
Acrolein	0.29	NA	p,p'-DDD	0.023	0.087	N-Nitrosodiethylamine	0.40	28
Acrylamide		23	p,p'-DDE	0.031	0.087	N-Nitrosodimethylamine	0.40	37
Acrylonitrile	0.24	84	p,p'-DDT	0.0039	0.087	N-Nitrosodi-n-butyl-amine	0.40	17
Aldrin	0.021	0.066	1,2-Dichloropropane	0.85	18	N-Nitrosomethylethyl-ethylamine	0.40	2.3
4-Aminobiphenyl	0.13	NA	cis-1,3-Dichloro-propylene	0.036	18	N-Nitrosomorpholine	0.40	2.1
Aniline	0.81	14	trans-1,3-Dichloro-propylene	0.036	18	N-Nitrosopiperidine	0.013	35
Anthracene	0.059	3.4	Dieldrin	0.017	0.13	N-Nitrosopyrrolidine	0.013	35
Aramite	0.36	NA	Diethyl Phthalate	0.20	28	Parathion	0.014	4.6
Benzidine	0.00012	0.13	p-Dimethylaminoazo-benzene	0.13	29	Total PCB's	0.10	10
Benz(a)anthracene	0.059	3.4	2,4-Dimethyl Phenol	0.036	14	Pentachlorobenzene	0.055	10
Benzal chloride	0.55	6.0	Dimethyl Phthalate	0.047	28	Pentachloroethane	0.055	5.5
Benzene	0.14	10	Di-n-Butyl Phthalate	0.057	28	Pentachloronitrobenzene	0.055	4.8
Benzo(b)-fluoranthene	0.11	6.8	1,4-Dinitrobenzene	0.32	2.8	Pentachlorophenol	0.089	7.4
Benzo(k)-fluoranthene	0.11	6.8	4,6-Dinitro-o-Cresol	0.28	160	Phenacetin	0.081	16
Benzo(g,h,i)perylene	0.0055	1.8	2,4-Dinitrophenol	0.12	160	Phenanthrene	0.059	5.6
Benzo(a)pyrene	0.061	3.4	2,4-Dinitrotoluene	0.32	140	Phenol	0.039	6.2
BHC-alpha	0.00014	0.066	2,6-Dinitrotoluene	0.55	28	Phorate	0.021	4.6
BHC-beta	0.00014	0.066	Di-n-Octyl Phthalate	0.017	28	Phthalic acid	0.055	28
BHC-delta	0.023	0.066	Di-n-Propylnitrosamine	0.40	14	Phthalic anhydride	0.055	28
BHC-gamma	0.0017	0.066	1,4-Dioxane	12.0	170	Pronamide	0.093	1.5
Bromochloromethane	0.33	15	Diphenylamine	0.92	13	Propoxur	0.056	1.5
Methyl bromide (Bromomethane)	0.11	15	Diphenylnitrosamine	0.92	13	Pyrene	0.067	8.2
4-Bromophenyl Phenyl Ether	0.055	15	1,2-Diphenylhydrazine	0.087	89	Pyridine	0.014	16
n-Butyl alcohol	5.6	2.6	Disulfoton	0.017	6.2	Safrole	0.081	22
Butyl benzylphthalate	0.017	28	Dithiocarbamates (total)	0.028	28	Silvex(2,4,5-TP)	0.72	7.9
2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	0.066	2.5	Endosulfan I	0.023	0.066	1,2,4,5-Tetrachlorobenzene	0.055	14
Carbaryl	0.006	0.14	Endosulfan II	0.029	0.066	1,1,1,2-Tetrachloroethane	0.057	6.0
Carbofuran	0.006	1.4	Endosulfan sulfate	0.029	0.13	1,1,2,2-Tetrachloroethane	0.057	6.0
Carbophenothion	0.028	0.14	Endrin	0.0028	0.13	Tetrachloroethylene	0.056	5.6
Carbon disulfide		4.8mg/l	Endrin aldehyde	0.025	0.13	2,3,4,6-Tetrachlorophenol	0.030	30
Carbon tetrachloride	0.057	6.0	Ethyl acetate	0.34	33	Thiophanate	0.055	1.4
Chlordane (Alpha- and gamma- Isomers)	0.0033	0.26	Ethyl benzene	0.057	10	Toluene	0.080	10
2-Chloroaniline	0.46	14	Ethyl cyanide (Propanenitrile)	0.24	360	Toxaphene	0.0095	2.6
Chlorobenzene	0.057	6.0	Ethyl ether	0.12	160	Trialate	0.042	28
Chlorobenzilate	0.10	NA	Ethyl methacrylate	0.14	160	Tribromomethane (Bromoform)	0.63	15
2-Chloro-1,3-butadiene	0.057	0.28	Ethylene oxide	0.12	28	1,2,4-Trichlorobenzene	0.055	38
Chlorodibromomethane	0.057	15	Bis(2-ethylhexyl) Phthalate	0.28	28	1,1,1-Trichloroethane	0.054	6.0
Chloroethane	0.27	6.0	Famphur	0.017	15	1,1,2-Trichloroethane	0.054	6.0
Bis(2-Chloroethyl)ether	0.033	6.0	Fluoranthene	0.068	3.4	Trichloroethylene	0.054	6.0
2-Chloroethyl Vinyl ether	0.062	NA	Fluorene	0.059	3.4	Trichloromonofluoro-methane	0.020	30
Chloroform	0.046	6.0	Heptachlor	0.0012	0.066	2,4,5-Trichlorophenol	0.18	2.6
Bis(2-Chloro-1-methylethyl)ether	0.055	7.2	Heptachlor epoxide	0.016	0.066	2,4,6-Trichlorophenol	0.035	6.2
p-Chloro-m-cresol	0.018	14	Hexachlorobenzene	0.055	10	2,4,5-T[2,4,5-Trichloro-phenoxyacetic acid]	0.72	7.9
1-Chloronaphthalene	0.059	5.6	Hexachlorobutadiene	0.055	5.6	1,2,3-Trichloropropane	0.85	30
2-Chloronaphthalene	0.059	5.6	Hexachlorocyclo-pentadiene	0.057	2.4	1,1,2-Trichloro-1,2,2-trifluoroethane	0.057	30
2-Chlorophenol	0.044	5.7	Hexachloroethane	0.055	30	Vinyl chloride	0.27	6.0
3-Chloropropylene	0.036	30	Hexachlorophene	0.035	NA	Xylenes-total	0.32	30
Chrysene	0.059	3.4	Hexachloropropylene	0.035	30	Total of 6,6,6 [1]		
o-Cresol	0.11	5.6	Indeno(1,2,3-c,d)-Pyrene	0.0055	3.4	Antimony	1.9	1.15mg/l
m-Cresol	0.77	5.6	Isobutyl alcohol	5.6	170	Arsenic	1.4	5.0mg/l
p-Cresol	0.77	5.6	Isosafrole	0.081	2.6	Barium	1.2	21.0mg/l
Cresol-mixed Isomers	0.77	5.6	Kepone	0.0011	0.13	Beryllium	0.82	1.22mg/l
Cyanide (Total)	0.35	0.59mg/l	Methacrylonitrile	0.24	84	Cadmium	0.69	0.11mg/l
Cyanides (Amenable)			Methanol	5.6	0.75mg/l	Chromium (Total)	2.77	0.60mg/l
Cyanides (Not Otherwise Specified)			Methapyrilene	0.081	1.5	Cyanides (Total)	1.2	590
2,4-D (2,4-Dichlorophenoxyacetic Acid)	0.72	10	Methomyl	0.028	0.14	Cyanides (Amenable)	0.86	30
Daunomycin			Methoxychlor	0.25	0.18	Fluoride (Not UHC)		35
DDD	0.023	0.087	Methyl ethyl ketone	0.28	36	Lead	0.83	0.75mg/l
DDE	0.031	0.087	Methyl Isobutyl ketone	0.14	33	Mercury-All Others	0.15	0.025mg/l
DDT	0.0039	0.087	Methyl methacrylate	0.19	160	Mercury-Amalgam	0.15	0.20mg/l
Dibenz(a,h)anthracene	0.055	8.2	Methyl methanesulfonate	0.018	NA	Nickel	1.98	11.0mg/l
Dibenzofuran	0.059	NA	Methyl parathion	0.014	4.6	Selenium	0.82	5.7mg/l
1,2-Dibromo-3-chloropropane	0.11	15	3-Methylcholanthrene	0.0055	15	Silver	0.43	0.14mg/l
Dibromomethane		15	4,4-Methylene bis-(2-chloroaniline)	0.50	30	Sulfide		
Di-n-butylamine	0.028	15	Methylene chloride	0.089	30	Thallium	1.4	0.20mg/l
Dichlorodifluoromethane	0.23	7.2	Naphthalene	0.059	5.6	Vanadium (Not UHC)	4.3	1.6mg/l
1,3-Dichlorobenzene	0.036	6.0	1,4-Naphthoquinone	0.057	NA	Zinc (Not UHC)	2.61	4.3mg/l
1,4-Dichlorobenzene	0.090	6.0	1-Naphthylamine	0.52	NA			
1,2-Dichlorobenzene	0.088	6.0	2-Naphthylamine	0.52	NA			
3,3-Dichlorobenzidine	0.46	30	Nitrobenzene	0.068	14			
Dichlorodifluoromethane	0.23	7.2	o-Nitrophenol	0.028	13			
1,1-Dichloroethane	0.059	6.0	p-Nitrophenol	0.12	29			
1,2-Dichloroethane	0.21	6.0	N-Nitrosodi-n-butylamine	0.40	17			

Regulated Hazardous Constituents for TCLP-RCRA are indicated with (*)

TOTAL P.04

11/13/2002 08:19AM

Manifest: WPS#: 59011

Universal Treatment Standards 40 CFR 268.48

INSTRUCTIONS: This page needs completion only if "YES" is indicated under Wastes Subject to Treatment section.

Indicate with an "X" any Underlying Hazardous Constituent reasonably expected to be present in this waste.

Constituents by Chemical Name	WW Conc.	NWW Conc.
__ Acenaphthene	0.059	3.4
__ Acenaphthylene	0.059	3.4
__ Acetone*	0.28	160
__ Acetonitrile	3.6	38
__ Acetophenone	0.010	9.7
__ 2-Acetylaminofluorene	0.059	140
__ Acrolein	0.29	NA
__ Acrylamide	19	23
__ Acrylonitrile	0.24	84
__ Aldrin	0.021	0.066
__ 4-Aminobiphenyl	0.13	NA
__ Aniline	0.81	14
__ Anthracene	0.059	3.4
__ Aramite	0.36	NA
__ Benchocarb	0.056	1.4
__ Benomyl	0.056	1.4
__ Benz(a)Anthracene	0.059	3.4
__ Benzal Chloride	0.055	6.0
__ Benzene*	0.14	10
__ Benzo(b)-Fluoranthene	0.11	6.8
__ Benzo(k)-Fluoranthene	0.11	6.8
__ Benzo(g,h,i)perylene	0.0055	1.8
__ Benzo(a)pyrene	0.061	3.4
__ alpha-BHC	0.00014	0.066
__ beta-BHC	0.00014	0.066
__ delta-BHC	0.023	0.066
__ gamma-BHC	0.0017	0.066
__ Bromochloromethane	0.35	15
__ Methyl bromide-(Bromomethane)	0.11	15
__ 4-Bromophenyl Phenyl Ether	0.055	15
__ N-Butyl alcohol*	5.6	2.6
__ Butyl benzyl phthalate	0.017	28
__ 2-sec-Butyl-4,6 dinitrophenol (Dinoseb)	0.066	2.5
__ Carbaryl	0.006	0.14
__ Carbenzadim	0.056	1.4
__ Carbofuran	0.006	0.14
__ Carbon disulfide*	3.8	4.8mg/l
__ Carbon tetrachloride*	0.057	6.0
__ Chlordane (alpha- and gamma isomers)	0.0033	0.26
__ p-Chloroaniline	0.46	16
__ Chlorobenzene*	0.057	6.0
__ Chlorobenzilate	0.10	NA
__ 2-Chloro-1,3 butadiene	0.057	0.28
__ Chlorodibromomethane	0.057	15
__ Chloroethane	0.27	6.0
__ bis(2-Chloro-ethoxy) methane	0.036	7.2
__ bis(2-Chloroethyl)ether	0.033	6.0
__ 2-Chloroethyl Vinyl ether	0.062	NA
__ Chloroform	0.046	6.0
__ bis(2-Chloro-isopropyl)ether	0.055	7.2
__ p-Chloro-m-cresol	0.018	14
__ Chloromethane (Methyl Chloride)	0.19	30
__ 2-Chloronaphthalene	0.055	5.6
__ 2-Chlorophenol	0.044	5.7
__ 3-Chloropropylene	0.036	30
__ Chrysene	0.059	3.4
X o-Cresol*	0.11	5.6
X m-Cresol*	0.77	5.6
X p-Cresol*	0.77	5.6
__ Cyclohexanone*	0.36	0.75mg/l
__ o,p'-DDD	0.023	0.087
__ o,p'-DDE	0.031	0.087
__ o,p'-DDT	0.0039	0.087
__ Dibenz(a,h)Anthracene	0.055	8.2
__ Dibenz(a,e)pyrene	0.061	NA
__ 1,2-Dibromo-3-chloropropane	0.11	15
__ Ethylene dibromide - (1,2-Dibromoethane)	0.028	15
__ Dibromomethane	0.11	15
__ m-Dichlorobenzene	0.036	6.0
__ o-Dichlorobenzene*	0.088	6.0
__ p-Dichlorobenzene	0.090	6.0
__ Dichlorodifluoromethane	0.23	7.2
__ 1,1-Dichloroethane	0.059	6.0
__ 1,2-Dichloroethane	0.21	6.0
__ 1,1-Dichloroethylene	0.025	6.0
__ trans-1,2-Dichloro-ethylene	0.054	30
__ 2,4-Dichlorophenol	0.044	14
__ 2,6-Dichlorophenol	0.044	14
__ 2,4-D(2,4-Dichlorophenoxyacetic Acid	0.72	10
__ p,p'-DDD	0.023	0.087
__ p,p'-DDE	0.031	0.087
__ p,p'-DDT	0.0039	0.087
__ 1,2-Dichloropropane	0.85	18
__ cis-1,3-Dichloro-propylene	0.036	18
__ trans-1,3-Dichloro-propylene	0.036	18
__ Dieldrin	0.017	0.13
__ Diethyl Phthalate	0.20	28
__ p-Dimethylaminoazo-benzene	0.13	NA
__ 2,4-Dimethyl Phenol	0.036	14
__ Dimethyl Phthalate	0.047	28
__ Di-N-Butyl Phthalate	0.057	28
__ 1,4-Dinitrobenzene	0.32	2.3
__ 4,6-Dinitro-O-Cresol	0.28	160
__ 2,4-Dinitrophenol	0.12	160
__ 2,4-Dinitrotoluene	0.32	140
__ 2,6-Dinitrotoluene	0.55	28
__ Di-N-Octyl Phthalate	0.017	28
__ Di-N-Propylnitrosamine	0.40	14
__ 1,4-Dioxane	12.0	170
__ Diphenylamine	0.92	13
__ Diphenylnitrosamine	0.92	13
__ 1,2-Diphenylhydrazine	0.087	NA
__ Disulfoton	0.017	6.2
__ Dithiocarbamates (total)	0.028	28
__ Endosulfan I	0.023	0.066
__ Endosulfan II	0.029	0.13
__ Endosulfan sulfate	0.029	0.13
__ Endrin	0.0028	0.13
__ Endrin aldehyde	0.025	0.13
__ Ethyl acetate*	0.34	33
__ Ethyl benzene*	0.057	10
__ Ethyl cyanide (Propanenitrile)	0.24	360
__ Ethyl ether*	0.12	160
__ Ethyl methacrylate	0.14	160
__ Ethylene oxide	0.12	NA
__ bis(2-Ethyhexyl) Phthalate	0.28	28
__ Famphur	0.017	15
X Fluoranthene	0.068	3.4
__ Fluorene	0.059	3.4
__ Heptachlor	0.0012	0.066
__ Heptachlor epoxide	0.016	0.066
__ Hexachlorobenzene	0.055	10
__ Hexachlorobutadiene	0.055	5.6
__ Hexachlorocyclo-pentadiene	0.057	2.4
__ Hexachloroethane	0.055	30
__ Hexachloropropylene	0.035	30
__ Indeno(1,2,3-c,d) Pyrene	0.0055	3.4
__ Iodomethane	0.19	65
__ Isobutyl alcohol*	5.6	170
__ Isodrin	0.021	0.066
__ Isosafrole	0.081	2.6
__ Kepone	0.0011	0.13
__ Methacrylonitrile	0.24	84
__ Methanol*	5.6	0.75mg/l
__ Methapyrilene	0.081	1.5
__ Methoxychlor	0.25	0.18
__ Methyl ethyl ketone*	0.28	36
__ Methyl isobutyl ketone*	0.14	33
__ Methyl methacrylate	0.14	160
__ Methyl methansulfonate	0.018	NA
__ Methyl parathion	0.014	4.6
__ 3-Methylcholanthrene	0.0055	15
__ 4,4-Methylene Bis-(2-chloroaniline)	0.50	30
__ Methylene chloride*	0.089	30
X Naphthalene	0.059	5.6
__ 2-Naphthylamine	0.52	NA
__ o-Nitroaniline	0.27	14
__ p-Nitroaniline	0.028	28
__ Nitrobenzene*	0.068	14
__ 5-Nitro-O-toluidine	0.32	28
__ o-Nitrophenol	0.028	13
__ p-Nitrophenol	0.12	29
__ N-Nitrosodiethylamine	0.40	28
__ N-Nitrosodimethylamine	0.40	2.3
__ N-Nitroso-Di-N-Butyl-amine	0.40	17
__ N-Nitrosomethyl-ethylamine	0.40	2.3
__ N-Nitrosomorpholine	0.40	2.3
__ N-Nitrosopiperidine	0.013	35
__ N-Nitrosopyrrolidine	0.013	35
__ Parathion	0.014	4.6
__ Total PCB's	0.10	10
__ Pentachlorobenzene	0.055	10
__ Pentachloroethane	0.055	6.0
__ Pentachloronitrobenzene	0.055	4.8
__ Pentachlorophenol	0.089	7.4
__ Phenacetin	0.081	16
X Phenanthrene	0.059	5.6
__ Phenol	0.039	6.2
__ Phorate	0.021	4.6
__ Phthalic acid	0.055	28
__ Phthalic anhydride	0.053	28
__ Pronamide	0.093	1.5
__ Propoxur	0.056	1.4
X Pyrene	0.067	8.2
__ Pyridine*	0.014	16
__ Safrole	0.081	22
__ Silvex(2,4,5-TP)	0.72	7.9
__ 1,2,4,5-Tetrachloro-benzene	0.055	14
__ 1,1,1,2-Tetrachloroethane	0.057	6.0
__ 1,1,2,2-Tetrachloroethane	0.057	6.0
__ Tetrachloroethylene*	0.056	6.0
__ 2,3,4,6-Tetrachlorophenol	0.030	7.4
__ Thiodicarb	0.019	1.4
X Toluene*	0.080	10
__ Toxaphene	0.0095	2.6
__ Triallate	0.042	1.4
__ Bromoform (tribromo-methane	0.63	15
__ 1,2,4-Trichlorobenzene	0.055	19
__ 1,1,1-Trichloroethane*	0.054	6.0
__ 1,1,2-Trichloroethane*	0.054	6.0
__ Trichloroethylene*	0.054	6.0
__ Trichloromonofluoro-methane*	0.020	30
__ 2,4,5-Trichlorophenol	0.18	7.4
__ 2,4,6-Trichlorophenol	0.035	7.4
__ 2,4,5-T(2,4,5-Trichloro-phenoxyacetic acid)	0.72	7.9
__ 1,2,3-Trichloropropane	0.85	30
__ 1,1,2-Trichloro-1,2,2-trifluoroethane*	0.057	30
__ Vinyl chloride	0.27	6.0
X Xylenes-Mixed Isomers (=Sum of o,m,& p)*	0.32	30
__ Antimony	1.9	1.15mg/l
__ Arsenic	1.4	5.0mg/l
__ Barium	1.2	21.0mg/l
__ Beryllium	0.82	1.22mg/l
__ Cadmium	0.69	0.11mg/l
__ Chromium(Total)	2.77	0.60mg/l
__ Cyanides (Total)	1.2	590
__ Cyanides (Amenable)	0.86	30
__ Fluoride (Not UHC)	35	NA
__ Lead	0.69	0.75mg/l
__ Mercury-All Others	0.15	0.025mg/l
__ Nickel	3.98	11.0mg/l
__ Selenium	0.82	5.7mg/l
__ Silver	0.43	0.14mg/l
__ Sulfide	14	NA
__ Thallium	1.4	0.20mg/l
__ Vanadium (Not UHC)	4.3	1.6mg/l
__ Zinc (Not UHC)	2.61	4.3mg/l

Regulated Hazardous Constituents for F001-F005 are indicated with (*)

NOTIFICATON OF WASTE SUBJECT
TO LAND DISPOSAL RESTRICTIONS

Revised 11/98

Generator STATE UNIVERSITY OF NEW YORK
Address 1 COLLEGE CIRCLE
GENESEO 14454 - ___

Manifest # _____
Shipper # _____
U.S. EPA ID# NYD073669350

1. The generator named above hereby provides the following NOTIFICATION to Ross Incineration Services, Inc. (RIS) as required by 40 CFR 268.7(a)(1) and the OAC3745-59-07(A)(1). The waste material shipped under the above Manifest Document Number is subject to Land Disposal Restriction regulations as set forth in 40 CFR 268 Subpart D/OAC3745-59.

2. Check all UNDERLYING HAZARDOUS CONSTITUENTS (UHC's), on the attached form, which can reasonably be expected to be present in the waste at a concentration above the constituent specific treatment standard, listed in 40 CFR Part 268.48, Table UTS - Universal Treatment Standards. UHC's must be identified for D001 (if not treated by CMBST or RORGS), D002, D003 (except reactive cyanides and unexploded ordnance subcategories), D004-D011 (specific sub-categories) and D012-D043. Wastewater forms of D012-D017 do not require that UHC's be identified.

   Check all F001-F005 REGULATED HAZARDOUS CONSTITUENTS (RHC'S) which can be reasonably expected to be present in this waste at a concentration above the constituent specific treatment standard listed in 40 CFR Part 268.48.

3. A separate page must be used for each WPS in which RHC's or UHC's are present.

4. Waste Analysis is attached where available, otherwise, the information contained herein is based upon my thorough knowledge of the waste(s).

UNDERLYING HAZARDOUS CONSTITUENTS

Aldicarb sulfone	HxCDDs(All Hexachlorodibenzo-p-dioxins)	Physostigmine
Barban	HxCDFs(All Hexachlorodibenzofurans)	Physostigmine salicylate
Butylate	3-Iodo-2-propynyl n-butylcarbamate	Promecarb
Carbofuran phenol	Methiocarb	Propham
Carbosulfan	Methomyl	Prosulfocarb
m-Cumenyl methylcarbamate	Metolcarb	TCDDs(All Tetrachlorodibenzo-p-dioxins)
Cycloate	Mexacarbate	TCDFs(All Tetrachlorodibenzofurans)
EPTC	Molinate	Thiophanate-methyl
Formetanate hydrochloride	Oxamyl	Triethylamine
	Pebulate	tris-(2,3-Dibromopropyl) phosphate
	PeCDDs(All Pentachlorodibenzo-p-dioxins)	Vernolate
	PeCDFs(All Pentachlorodibenzofurans)	Mercury-NWW from Retort

(X) THE ABOVE UNDERLYING HAZARDOUS CONSTITUENTS ARE NOT "REASONABLY EXPECTED" TO BE PRESENT IN THE WASTE PRODUCT SURVEYS LISTED IN WASTES SUBJECT TO TREATMENT.

ROSS INCINERATION SERVICES, INC. CANNOT ACCEPT WASTE WITH THESE UNDERLYING HAZARDOUS CONSTITUENTS WITHOUT SPECIAL APPROVALS. PLEASE CONTACT YOUR ACCOUNT REPRESENTATIVE IF APPROVALS ARE NEEDED.

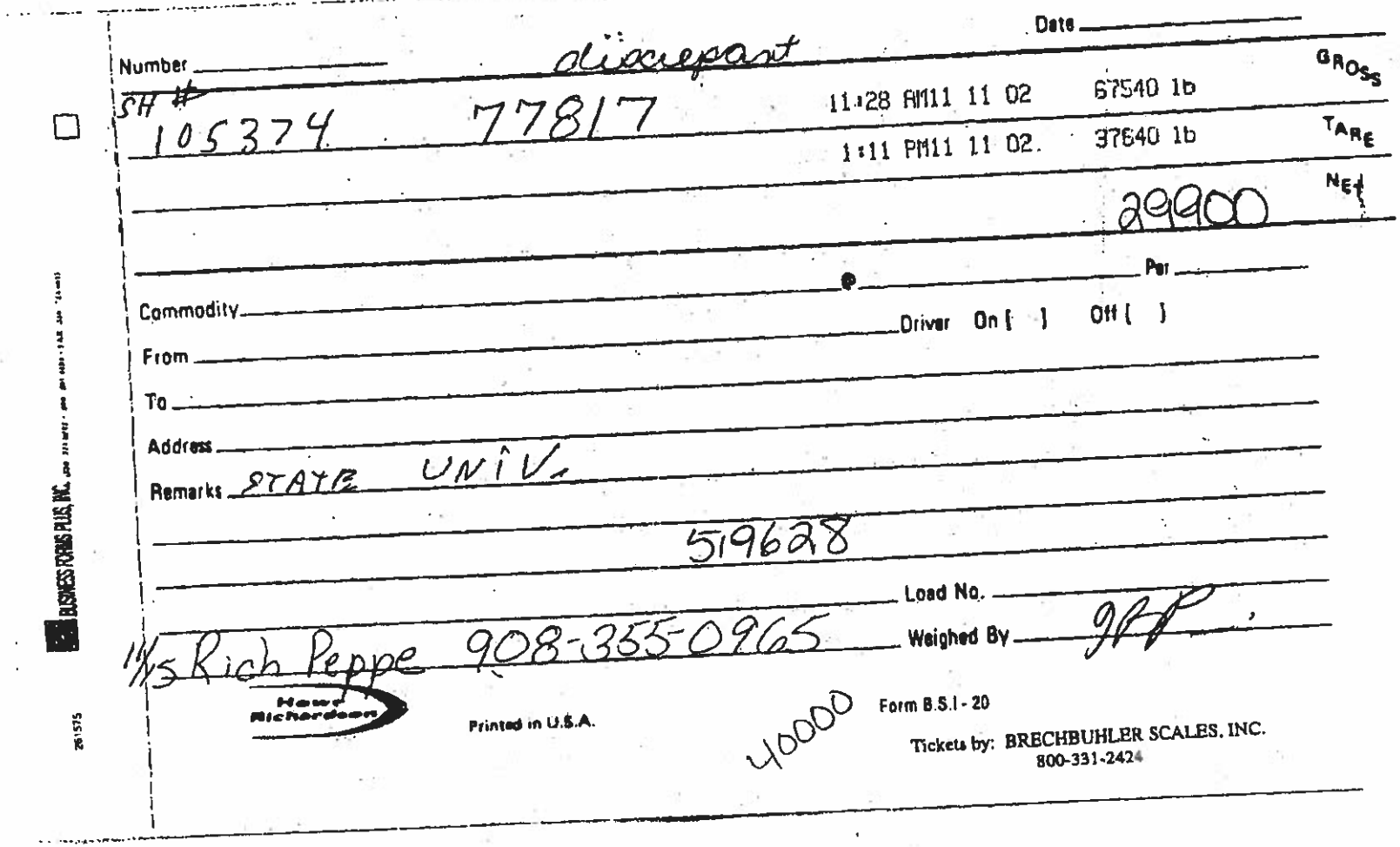
WASTES SUBJECT TO TREATMENT
Nonwastewater(NWW) Wastewater(WW)

WPS #	Treatability Group	EPA Codes & Subcategory(if applicable)	Are UHC's or RHC's present?
39011	NWW	D018	YES (circled) NO

Signature X _____ Date _____

Name _____ Title _____

It is the generator's responsibility under 40 CFR 268/OAC2745-59 to ensure that appropriate notifications accompany each shipment of waste as required. RIS makes no representations as to the accuracy of this form and recommends that the generator independently verify notification requirements for the waste streams.



Number discrepant Date

SH # 105374 77817

11:28 AM11 11 02 67540 lb GROSS

1:11 PM11 11 02 37640 lb TARE

29900 NET

Per

Commodity Driver On [ ] Off [ ]

From

To

Address

Remarks STATE UNIV.

519628

Load No.

1/5 Rich Peppe 908-355-0965 Weighed By JRP

Howe Richardson

Printed in U.S.A.

40000

Form B.S.I - 20

Tickets by: BRECHBUHLER SCALES, INC.
800-331-2424

BUSINESS FORMS PLUS, INC.

261575

Shipper 105374
Weight discrepant, originally manifested as 40000 lbs.
Changed to 29900 lbs.

CERTIFICATE OF TREATMENT

GENERATOR INFORMATION

STATE UNIVERSITY OF NEW YORK
GENESEO NY
EPA # NYD073669350

DATE RECEIVED..... 11/11/02

SHIPPER NUMBER..... 0105374

MANIFEST NUMBER..... 77817

PROCESSED AS OF..... 11/17/02

The above material has been processed at:

Ross Incineration Services, Inc.
36790 Giles Road
Grafton, Ohio 44044-9752
(440) 748-2171

US EPA ID # OHD048415665

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake ... 7-2530 FAX 585-647-3311

ATTACHMENT 4

LABORAT... SIS

Client: NYE TECH
Client Job Site: Suny Geneseo
Parking Lot Excavation
Client Job No.: 3954

Lab Project No.: 03-0196
Sample Type: Soil
Analytical Method: SW846, 9012
Date Sampled: 01/10/2003
Date Received: 01/10/2003
Date Analyzed: 01/16/2003

Lab Sample ID.	Field Location/Sample ID	T. Cyanide (mg/kg)
1324	S-1, NE Pit Floor	4.1
1325	S-2, SW Pit Floor	ND<0.5
1326	S-3, SW Pit Lower Wall	ND<0.5
1327	S-4, SW Pit Upper Wall	ND<0.5
1328	S-5, West Pit Lower Wall	ND<0.5
1329	S-6, West Pit Upper Wall	ND<0.5

ELAP ID No. 10709

Comments: ND denotes Non Detected.

Approved By Technical Director: _____
Bruce Hoogesteger

Chain of Custody provides additional sample information.

File ID: VarLocCN03-0196

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1324
Client Job Number:	N/A		
Field Location:	NE Pit Floor	**Date Sampled:**	01/10/2003
Field ID Number:	S-1	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/17/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 3,470
Anthracene	3,510
Benzo (a) anthracene	17,300
Benzo (a) pyrene	26,600
Benzo (b) fluoranthene	27,300
Benzo (g,h,i) perylene	15,600
Benzo (k) fluoranthene	12,400
Chrysene	15,400
Dibenz (a,h) anthracene	ND< 3,470
Fluoranthene	18,300
Fluorene	ND< 3,470
Indeno (1,2,3-cd) pyrene	17,500
Naphthalene	ND< 3,470
Phenanthrene	5,810
Pyrene	20,300
Pyridine	ND< 3,470

ELAP Number 10958 Method: EPA 8270C Data File: 10070.D

179,620 (w/out adding ND)

196,970 (w/ND's)

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information.

File ID: 030196S1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1325
Client Job Number:	N/A		
Field Location:	SW Pit Floor	**Date Sampled:**	01/10/2003
Field ID Number:	S-2	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/14/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 332
Anthracene	ND< 332
Benzo (a) anthracene	428
Benzo (a) pyrene	404
Benzo (b) fluoranthene	456
Benzo (g,h,i) perylene	ND< 332
Benzo (k) fluoranthene	ND< 332
Chrysene	381
Dibenz (a,h) anthracene	ND< 332
Fluoranthene	744
Fluorene	ND< 332
Indeno (1,2,3-cd) pyrene	ND< 332
Naphthalene	ND< 332
Phenanthrene	485
Pyrene	661
Pyridine	ND< 332

ELAP Number 10958 Method: EPA 8270C Data File: 10021.D

3,559 (w/o ND's)
6,547 (w/ ND's)

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196S2.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC. 179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1326
Client Job Number:	N/A		
Field Location:	SW Pit Lower Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-3	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/14/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 299
Anthracene	ND< 299
Benzo (a) anthracene	ND< 299
Benzo (a) pyrene	ND< 299
Benzo (b) fluoranthene	ND< 299
Benzo (g,h,i) perylene	ND< 299
Benzo (k) fluoranthene	ND< 299
Chrysene	ND< 299
Dibenz (a,h) anthracene	ND< 299
Fluoranthene	ND< 299
Fluorene	ND< 299
Indeno (1,2,3-cd) pyrene	ND< 299
Naphthalene	ND< 299
Phenanthrene	ND< 299
Pyrene	ND< 299
Pyridine	ND< 299

ELAP Number 10958 Method: EPA 8270C Data File: 10022.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: 

Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196S3.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1327
Client Job Number:	N/A		
Field Location:	SW Pit Upper Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-4	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/14/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 327
Anthracene	ND< 327
Benzo (a) anthracene	1,020
Benzo (a) pyrene	1,060
Benzo (b) fluoranthene	1,200
Benzo (g,h,i) perylene	553
Benzo (k) fluoranthene	443
Chrysene	891
Dibenz (a,h) anthracene	ND< 327
Fluoranthene	1,650
Fluorene	ND< 327
Indeno (1,2,3-cd) pyrene	651
Naphthalene	ND< 327
Phenanthrene	434
Pyrene	1,510
Pyridine	ND< 327

ELAP Number 10958 Method: EPA 8270C Data File: 10023.D

9,412 (w/o ND's)
11,074 (w/ ND's)

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196S4.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1328
Client Job Number:	N/A		
Field Location:	West Pit Lower Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-5	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/17/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 2,940
Anthracene	5,940
Benzo (a) anthracene	10,500
Benzo (a) pyrene	9,050
Benzo (b) fluoranthene	10,900
Benzo (g,h,i) perylene	4,180
Benzo (k) fluoranthene	4,460
Chrysene	8,710
Dibenz (a,h) anthracene	ND< 2,940
Fluoranthene	21,400
Fluorene	3,350
Indeno (1,2,3-cd) pyrene	5,290
Naphthalene	ND< 2,940
Phenanthrene	18,100
Pyrene	17,300
Pyridine	ND< 2,940

ELAP Number 10958 Method: EPA 8270C Data File: 10071.D

119,180 (w/o ND's)

133,880 (w/ ND's)

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information

File ID: 030196s5.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1329
Client Job Number:	N/A		
Field Location:	West Pit Upper Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-6	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/14/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 359
Anthracene	670
Benzo (a) anthracene	725
Benzo (a) pyrene	620
Benzo (b) fluoranthene	679
Benzo (g,h,i) perylene	ND< 359
Benzo (k) fluoranthene	ND< 359
Chrysene	576
Dibenz (a,h) anthracene	ND< 359
Fluoranthene	1,440
Fluorene	699
Indeno (1,2,3-cd) pyrene	ND< 359
Naphthalene	5,860
Phenanthrene	2,070
Pyrene	1,090
Pyridine	ND< 359

ELAP Number 10958 Method: EPA 8270C Data File: 10025.D

14,429 (w/o ND's)

16,583 (w/ ND's)

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196S6.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1324
Client Job Number:	N/A		
Field Location:	NE Pit Floor	**Date Sampled:**	01/10/2003
Field ID Number:	S-1	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/15/2003

Aromatics	Results in ug / Kg
Benzene	ND< 8.56
Ethylbenzene	ND< 8.56
Toluene	ND< 8.56
m,p - Xylene	ND< 8.56
o - Xylene	ND< 8.56

ELAP Number 10958 Method: EPA 8260B Data File: 63545.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196V1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1325
Client Job Number:	N/A		
Field Location:	SW Pit Floor	**Date Sampled:**	01/10/2003
Field ID Number:	S-2	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/15/2003

Aromatics	Results in ug / Kg
Benzene	ND< 5.51
Ethylbenzene	ND< 5.51
Toluene	ND< 5.51
m,p - Xylene	6.29
o - Xylene	ND< 5.51

ELAP Number 10958 Method: EPA 8260B Data File: 63546.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196V2.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1326
Client Job Number:	N/A		
Field Location:	SW Pit Lower Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-3	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/15/2003

Aromatics	Results in ug / Kg
Benzene	28.1
Ethylbenzene	ND< 6.08
Toluene	12.4
m,p - Xylene	11.1
o - Xylene	ND< 6.08

ELAP Number 10958 Method: EPA 8260B Data File: 63547.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196V3.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1327
Client Job Number:	N/A		
Field Location:	SW Pit Upper Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-4	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/17/2003

Aromatics	Results in ug / Kg
Benzene	ND< 10.2
Ethylbenzene	ND< 10.2
Toluene	ND< 10.2
m,p - Xylene	ND< 10.2
o - Xylene	ND< 10.2

ELAP Number 10958 Method: EPA 8260B Data File: 63570.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196v4.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1328
Client Job Number:	N/A		
Field Location:	West Pit Lower Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-5	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/15/2003

Aromatics	Results in ug / Kg
Benzene	2,480
Ethylbenzene	ND< 1,130
Toluene	883
m,p - Xylene	3,330
o - Xylene	1,140

ELAP Number 10958 Method: EPA 8260B Data File: 63549.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196v5.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo Parking Lot Excavation	**Lab Project Number:**	03-0196
		Lab Sample Number:	1329
Client Job Number:	N/A		
Field Location:	West Pit Upper Wall	**Date Sampled:**	01/10/2003
Field ID Number:	S-6	**Date Received:**	01/10/2003
Sample Type:	Soil	**Date Analyzed:**	01/15/2003

Aromatics	Results in ug / Kg
Benzene	ND< 10.5
Ethylbenzene	ND< 10.5
Toluene	ND< 10.5
m,p - Xylene	ND< 10.5
o - Xylene	ND< 10.5

ELAP Number 10958 Method: EPA 8260B Data File: 63550.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030196V6.XLS

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(716) 647-2530 * (800) 724-1997

CHAIN OF CUSTODY

REPORT TO:

COMPANY: NYETECH
ADDRESS: 230 McKee Rd.
CITY: Rochester STATE: NY ZIP: 14611
PHONE: 436-5660 FAX: 436-6139
ATTN: Frank Booher

INVOICE TO:

COMPANY:
ADDRESS:
CITY: STATE: ZIP:
PHONE: FAX:
ATTN:

LAB PROJECT #: 03-0196
CLIENT PROJECT #:

TURNAROUND TIME: (WORKING DAYS)
[ ] 1 [ ] 2 [ ] 3 [X] STD [ ] 5 [ ] OTHER

PROJECT NAME/SITE NAME:
SUNY Geneseo
Parking Lot Excavation

COMMENTS:

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER OF CONTAINERS	BTEX	Pyridene	TCN	8270							REMARKS	PARADIGM LAB SAMPLE NUMBER
1	1-10-03	1230		X	S-1 NE Pit Floor	S	1	X	X	X	X							Soil	13246
2				X	S-2 SW Pit Floor	S	1	X	X	X	X							Shale	13255
3				X	S-3 SW Pit Lower Wall	S	1	X	X	X	X							Shale	13256
4				X	S-4 SW Pit Upper Wall	S	1	X	X	X	X							Soil	13257
5				X	S-5 West Pit Lower Wall	S	1	X	X	X	X							Shale	13258
6				X	S-6 West Pit Upper Wall	S	1	X	X	X	X							Soil	13259
7																			
8																			
9																			
10																			

LAB USE ONLY

SAMPLE CONDITION: Check box if acceptable or note deviation:
CONTAINER TYPE: √
PRESERVATIONS: √
HOLDING TIME: √
TEMPERATURE: √ 10°C

Sampled By:
Date/Time: 1/10/03 1230

Relinquished By:
Date/Time: 1/10/03 1430

Received By:
Date/Time:

Relinquished By:
Date/Time:

Received By:
Date/Time:

Received @ Lab By:
Date/Time: 1/10/03 @ 15:30

Total Cost:

P.I.F.

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 * (800) 724-1997
FAX: (585) 647-3311

CHAIN OF CUSTODY

COMPANY: AVANTECH
ADDRESS: MOTOR PKWY
CITY: ROCHESTER STATE: N.Y. ZIP:
PHONE: 585-436-5660 FAX:
ATTN: FRANK BOCCIO
COMMENTS:

COMPANY: SAME
ADDRESS:
CITY: STATE: ZIP:
PHONE: FAX:
ATTN:

LAB PROJECT #: 03-0408
CLIENT PROJECT #: 3952 CANISTERS

TURNAROUND TIME: (WORKING DAYS)
STD ☑ 5 OTHER ☐ 1 ☐ 2 ☐ 3

PROJECT NAME/SITE NAME: SUNY GENESEO

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER OF CONTAINERS	BTEX	8270	PAHs	TCL							REMARKS	PARADIGM LAB SAMPLE NUMBER
1	2/3/03				NORTH WALL	S	1	✓	✓	✓	✓								2014
2	2/3/03				EAST WALL		1	✓	✓	✓	✓								2015
3	2/3/03				NORTHWEST WALL		1	✓	✓	✓	✓								2016
4																			
5																			
6																			
7																			
8																			
9																			
10																			

LAB USE ONLY

SAMPLE CONDITION: Check box if acceptable or note deviation:
CONTAINER TYPE: ✓ PRESERVATIONS: ✓ HOLDING TIME: ✓ TEMPERATURE: 19°C

Sampled By: TODD ATSCHUL Date/Time: 2/3/03 NOON
Relinquished By: T. D. Bock Date/Time: 2/4/03 11:30
Received By: Jason Oates Date/Time: 2/4/03 1130

Relinquished By: Date/Time:
Received By: Date/Time:
Received @ Lab By: Mike O'Mara Date/Time: 2/4/03 1330

Total Cost:
P.I.F.

PARADIGM
ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 (585) 647-2530 FAX (585) 647-3311

LABORATORY REPORT OF ANALYSIS

Client: NYE Tech

Client Job Site: SUNY Geneseo

Client Job No.: 3954 Geneseo

Lab Project No.: 03-0408

Sample Type: Soil
Analytical Method: SW 9012
Date Sampled: 02/03/2003
Date Received: 02/04/2003
Date Analyzed: 02/11-02/12/2003

Lab Sample ID.	Sample Location/Field ID	Total Cyanide (mg/kg)
2012	North Wall	22
2013	East Wall	11
2014	Northwest Wall	4.1

ELAP ID No. 10709

Comments: ND denotes Non-Detected.

Approved By Technical Director: _____
Bruce Hoogesteger

RECEIVED
MAY 12 2003

Chain of Custody provides additional sample information.

File ID: TCN03-0408.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo	**Lab Project Number:**	03-0408
		Lab Sample Number:	2012
Client Job Number:	39521		
Field Location:	North Wall	**Date Sampled:**	02/03/2003
Field ID Number:	N/A	**Date Received:**	02/04/2003
Sample Type:	Soil	**Date Analyzed:**	02/10/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 3,630
Anthracene	8,910
Benzo (a) anthracene	59,700
Benzo (a) pyrene	75,700
Benzo (b) fluoranthene	79,600
Benzo (g,h,i) perylene	39,400
Benzo (k) fluoranthene	35,700
Chrysene	54,500
Dibenz (a,h) anthracene	14,900
Fluoranthene	60,400
Fluorene	ND< 3,630
Indeno (1,2,3-cd) pyrene	47,400
Naphthalene	ND< 3,630
Phenanthrene	14,100
Pyrene	59,400
Pyridine	ND< 3,630

ELAP Number 10958 Method: EPA 8270C Data File: 10244.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030408S1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo	**Lab Project Number:**	03-0408
		Lab Sample Number:	2013
Client Job Number:	39521		
Field Location:	East Wall	**Date Sampled:**	02/03/2003
Field ID Number:	N/A	**Date Received:**	02/04/2003
Sample Type:	Soil	**Date Analyzed:**	02/10/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 3,370
Anthracene	ND< 3,370
Benzo (a) anthracene	13,600
Benzo (a) pyrene	15,800
Benzo (b) fluoranthene	16,800
Benzo (g,h,i) perylene	7,950
Benzo (k) fluoranthene	6,190
Chrysene	11,800
Dibenz (a,h) anthracene	ND< 3,370
Fluoranthene	13,500
Fluorene	ND< 3,370
Indeno (1,2,3-cd) pyrene	9,000
Naphthalene	ND< 3,370
Phenanthrene	5,670
Pyrene	11,900
Pyridine	ND< 3,370

ELAP Number 10958 Method: EPA 8270C Data File: 10245.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: 
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo	**Lab Project Number:**	03-0408
		Lab Sample Number:	2014
Client Job Number:	39521		
Field Location:	North-West Wall	**Date Sampled:**	02/03/2003
Field ID Number:	N/A	**Date Received:**	02/04/2003
Sample Type:	Soil	**Date Analyzed:**	02/10/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 3,470
Anthracene	ND< 3,470
Benzo (a) anthracene	17,700
Benzo (a) pyrene	23,200
Benzo (b) fluoranthene	23,000
Benzo (g,h,i) perylene	13,000
Benzo (k) fluoranthene	9,940
Chrysene	16,000
Dibenz (a,h) anthracene	4,980
Fluoranthene	15,500
Fluorene	ND< 3,470
Indeno (1,2,3-cd) pyrene	15,000
Naphthalene	ND< 3,470
Phenanthrene	6,390
Pyrene	14,500
Pyridine	ND< 3,470

ELAP Number 10958 Method: EPA 8270C Data File: 10246.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information

File ID: 030408S3.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo	**Lab Project Number:**	03-0408
		Lab Sample Number:	2012
Client Job Number:	39521		
Field Location:	North Wall	**Date Sampled:**	02/03/2003
Field ID Number:	N/A	**Date Received:**	02/04/2003
Sample Type:	Soil	**Date Analyzed:**	02/10/2003

Aromatics	Results in ug / Kg
Benzene	ND< 9.10
Ethylbenzene	ND< 9.10
Toluene	ND< 9.10
m,p-Xylene	ND< 9.10
o-Xylene	ND< 9.10

ELAP Number 10958 Method: EPA 8021B (GC/MS) Data File: 13667.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: 

Bruce Hoogesteger: Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo	**Lab Project Number:**	03-0408
		Lab Sample Number:	2013
Client Job Number:	39521		
Field Location:	East Wall	**Date Sampled:**	02/03/2003
Field ID Number:	N/A	**Date Received:**	02/04/2003
Sample Type:	Soil	**Date Analyzed:**	02/10/2003

Aromatics	Results in ug / Kg
Benzene	ND< 6.45
Ethylbenzene	ND< 6.45
Toluene	ND< 6.45
m,p-Xylene	ND< 6.45
o-Xylene	ND< 6.45

ELAP Number 10958 Method: EPA 8021B (GC/MS) Data File: 13668.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030408v2.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	SUNY Geneseo	**Lab Project Number:**	03-0408
		Lab Sample Number:	2014
Client Job Number:	39521		
Field Location:	North-West Wall	**Date Sampled:**	02/03/2003
Field ID Number:	N/A	**Date Received:**	02/04/2003
Sample Type:	Soil	**Date Analyzed:**	02/07/2003

Aromatics	Results in ug / Kg
Benzene	ND< 9.79
Ethylbenzene	ND< 9.79
Toluene	ND< 9.79
m,p-Xylene	ND< 9.79
o-Xylene	ND< 9.79

ELAP Number 10958 Method: EPA 8021B (GC/MS) Data File: 13657.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information

File ID: 030408V3.XLS

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 * (800) 724-1997
FAX: (585) 647-3311

CHAIN OF CUSTODY

REPORT TO:
COMPANY: NYSEG
ADDRESS: McKee Rd. PO Box 2439
CITY: Rochester STATE: N.Y. ZIP: 14624
PHONE: 585-436-5660 FAX:
ATTN: Frank Boomer
COMMENTS:

INVOICE TO:
COMPANY: Same
ADDRESS:
CITY: STATE: ZIP:
PHONE: FAX:
ATTN:

LAB PROJECT #: 03-0408
CLIENT PROJECT #: 3954 Geneseo
TURNAROUND TIME: (WORKING DAYS)
☐ 1 ☐ 2 ☐ 3 ☑ STD 5 ☐ OTHER

PROJECT NAME/SITE NAME: SUNY Geneseo

REQUESTED ANALYSIS

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	BTEX	8270 *	Pyridine	TCL							REMARKS	PARADIGM LAB SAMPLE NUMBER
1	2/3/03				North Wall	S	1	✓	✓	✓	✓								2012
2	2/3/03				East Wall	↓	1	✓	✓	✓	✓								2013
3	2/3/03				North-West Wall	↓	1	✓	✓	✓	✓								2014
4																			
5																			
6																			
7																			
8																			
9																			
10																			

****LAB USE ONLY****

SAMPLE CONDITION: Check box if acceptable or note deviation: CONTAINER TYPE: ✓ PRESERVATIONS: ✓ HOLDING TIME: ✓ TEMPERATURE: ☐ 19°C

Sampled By: Todd Kiscer Date/Time: 2/3/03 Noon
Relinquished By: T. D. Boomer Date/Time: 2/4/03 11:30 AM
Received By: Jane A Adams Date/Time: 2/4/03 1130

Relinquished By: Date/Time:
Received By: Date/Time:
Received @ Lab By: Anne A Adams Date/Time: 2/4/03 1330

Total Cost:
P.I.F.

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	Geneseo College	**Lab Project Number:**	03-0354
		Lab Sample Number:	1785
Client Job Number:	R-3954		
Field Location:	S/W Pit Wall	**Date Sampled:**	01/28/2003
Field ID Number:	#1	**Date Received:**	01/29/2003
Sample Type:	Soil	**Date Analyzed:**	01/30/2003

Aromatics	Results in ug / Kg
Benzene	360
Ethylbenzene	ND< 113
Toluene	224
m,p-Xylene	549
o-Xylene	228

ELAP Number 10958 Method: EPA 8021B (GC/MS) Data File: 13598.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: Bruce Hoogesteger, Technical Director

Chain of Custody provides additional sample information

File ID: 030354V1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: NYETECH

Client Job Site:	Geneseo College	**Lab Project Number:**	03-0354
		Lab Sample Number:	1785
Client Job Number:	R-3954		
Field Location:	S/W Pit Wall	**Date Sampled:**	01/28/2003
Field ID Number:	#1	**Date Received:**	01/29/2003
Sample Type:	Soil	**Date Analyzed:**	01/31/2003

Base / Neutrals	Results in ug / Kg
Acenaphthene	ND< 283
Anthracene	ND< 283
Benzo (a) anthracene	ND< 283
Benzo (a) pyrene	ND< 283
Benzo (b) fluoranthene	ND< 283
Benzo (g,h,i) perylene	ND< 283
Benzo (k) fluoranthene	ND< 283
Chrysene	ND< 283
Dibenz (a,h) anthracene	ND< 283
Fluoranthene	ND< 283
Fluorene	ND< 283
Indeno (1,2,3-cd) pyrene	ND< 283
Naphthalene	1,360
Phenanthrene	ND< 283
Pyrene	ND< 283
Pyridine	ND< 283

ELAP Number 10958 Method: EPA 8270C Data File: 10202.D

Comments: ND denotes Non Detect
ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

Chain of Custody provides additional sample information

File ID: 030354S1.XLS

PARADIGM
ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 (585) 647-2530 FAX (585) 647-3311

LABORATORY REPORT OF ANALYSIS

Client: NYE Tech

Client Job Site: Geneseo College

Client Job No.: R-3954

Lab Project No.: 03-0354

Sample Type: Soil
Analytical Method: SW 9012
Date Sampled: 01/28/2003
Date Received: 01/28/2003
Date Analyzed: 02/05/2003

Lab Sample ID.	Sample Location/Field ID	Total Cyanide (mg/kg)
1785	S/W Pit Wall	ND<0.5

ELAP ID No. 10709

Comments: ND denotes Non-Detected.

Approved By Technical Director: _____
Bruce Hoogesteger

Chain of Custody provides additional sample information.

File ID: TCyanide03-0354.xls

Environmental PRODUCTS & SERVICES, INC.

(315) 471-0503/(800) 843-8265

CHAIN OF CUSTODY RECORD

EPS LAB LOG NO. ____________

JOB NUMBER: [illegible] PIN NUMBER: ____________

P.O. NUMBER: [illegible] SPILL NUMBER: ____________

LABORATORY: ____________

ADDRESS: ____________

PHONE NO.: ____________

REPORTING REQUIREMENTS (other than mail)

☐ PHONE NO.: ____________

☐ FAX NO.: ____________

Sample(s) State of Origin:

- CT ☐
- DE ☐
- MA ☐
- MD ☐
- NH ☐
- NJ ☐
- NY ☒
- PA ☐
- RI ☐
- VT ☐
- ___ ☐

TURN AROUND TIME (CALL AHEAD FOR APPROVAL FOR RUSH)

- 24-HOUR ☐
- 48-HOUR ☐
- NORMAL ☒
- OTHER ☐ ____________

LAB APPROVAL BY: ____________

SPECIAL DETECTION LIMITS ☐ Yes (Specify) ☐ No

SPECIAL QA/QC LEVEL ☐ Yes (Specify) ☐ No

WASTE SAMPLE ☐ Yes ☐ No

SAMPLE TYPE:

- G - GRAB
- C - COMPOSITE
- W - WIPE
- SS - SURFACE SCRAPE
- O - OTHER (SPECIFY)

CONTAINER TYPE:

- V - VOA VIALS
- G - GLASS
- P- PLASTIC
- O- OTHER ____________

SITE ADDRESS: [illegible]

SPECIAL INSTRUCTIONS: [illegible]

Lab Use Only	SAMPLE I.D./ DESCRIPTION	DATE	TIME	CONTAINER: Number	Size	Type (Enter Code)	MATRIX: Groundwater	Soil	Sludge	Other	TYPE (ENTER CODE)	PRESERVATIVE: HCl	HNO_3	H_2SO_4	Ice (4°C)	Teflon Liner	Filtered	Other	CORROS ☐ FLASH ☐ REACT ☐ pH ☐	TCLP: METALS ☐ VOA ☐ SEMI-VOA ☐	TCLP: PEST ☐ HERB ☐	TOTAL METALS ☐ SPECIFY:	OIL AND GREASE: EPA 413.1 ☐	PH: GRO ☐ DRO ☐ TPH GC ☐	TPH: EPA 418.1(IR) ☐ NYS DOH 310-13(GC) ☐	EPA 503.1 ☐ EPA 524 ☐ W/ MTBE ☐	EPA 601 ☐ EPA 8010 ☐ EPA 802 ☐ W/ MTBE ☐	EPA 602 ☐ EPA 8020 ☐ BTEX ☒ W/ MTBE ☐	EPA 608 ☐ EPA 8080 ☐ PCB ONLY ☐	EPA 624 ☐ EPA 8240 ☐ EPA 8260 ☐	EPA 625 ☒ EPA 8270 ☒ EPA 8270 BN ☐	T Cyanide	COMMENTS/ SAMPLING POINT(S)
1785	#1	1/28/03	12:00																									X			X	X	
[illegible]	#2	1/28/03	12:00																														S/W Air [illegible]
																																	S/W Air [illegible]

EPS CONTACT: ____________ PHONE NO.: [illegible]

CUSTODY TRANSFERS

		DATE	TIME			DATE	TIME
RELINQUISHED BY: (SAMPLER)	[illegible]	[illegible]	[illegible]	RECEIVED BY:	[illegible]	1/28/03	[illegible]
RELINQUISHED BY:				RECEIVED BY:	[illegible]	1/29/03	9:25
RELINQUISHED BY:				RECEIVED AT LAB BY:	[illegible]	[illegible]	[illegible]

White - LABORATORY Canary - PROJECT COORDINATOR

NYG 2887056

ATTACHMENT 5

Please type or print. Do not staple

US WASTE MANIFEST

Albany, New York 12212

(Hazardous Waste Manifest 1/88)

UNIFORM HAZARDOUS WASTE MANIFEST

Manifest Doc. No.	2. Page 1 of	Information within heavy bold line is not required by Federal Law.
	1	

3. Generator's Name and Mailing Address
1 College Circle
Geneseo NY 14454
Kimberly Dalton-Ferris

4. Generator's Telephone Number (585) 245-5511

A. NYG 2887056

B. Generator's ID SAME

5. Transporter 1 (Company Name) — 6. US EPA ID Number: NYD 1 2 8 1 1 4 1

C. State Transporter's ID

D. Transporter's Telephone (585) 424-5220

7. Transporter 2 (Company Name) — 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Telephone ( )

9. Designated Facility Name and Site Address
CECOS International, Inc.
5600 Niagara Falls Blvd.
Niagara Falls NY 14304-0340

10. US EPA ID Number: N Y D 0 8 0 3 3 6 2 4 1

G. State Facility ID

H. Facility Telephone (716) 282-2676

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers Number	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ Hazardous waste, liquid, n.o.s. (D018) 9, NA3082, III	0 0 1	T T	0 2 7 5 0	G	EPA D018
					STATE
b.					EPA
					STATE
c					EPA
					STATE
d.					EPA
					STATE

J. Additional Descriptions for Materials listed Above

a | c

b | d

K. Handling Codes for Wastes Listed Above

a: T | c:

b: | d:

15. Special Handling Instructions and Additional Information
WIS#8806 WO# 285799
Emer. Contact: Tim Hamilton 800 424 8802
a.12541-AAB, ERG# 171

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Mo.	Day	Year
Kimberly Dalton-Ferris		0 5	0 2	0 3

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Mo.	Day	Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Mo.	Day	Year

19. Discrepancy Indication Space
Quantity received 11.24 Tons

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Mo.	Day	Year
Tim Clark		0 5	0 2	0 3

GENERATOR

TRANSPORTER

FACILITY

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the NYS Department of Environmental Conservation (518) 457-7362

COPY 5—Generator—Mailed by TSD Facility

COPY 8—Generator—Retained by Generator

Land Disposal Restriction Form

ECOS International, Inc. EPA ID #: NYD080336241

5600 Niagara Falls Blvd.
Niagara Falls, NY 14304-0340

Generator Information:	*Site Information:*
EPA ID #: NYD073669350	
S.U.N.Y. @ Geneseo	S.U.N.Y. @ Geneseo
1 College Circle	1 College Circle
Geneseo, NY 14454	Geneseo, NY 14454
Billing Contact:	Phone: (585) 245-5511
Technical Contact:	Phone: (585) 245-5511

Name of Waste: Contaminated Groundwater Waste Codes: D018

State Manifest Number: NYG2887056 line item a

Federal Manifest Number:

Profile Number: 12541-AAB **LDR Nonwastewater Treatability Group**

A. F001-F005 Solvent Restrictions

There are no F001-F005 solvent restricted wastes present that are banned from land disposal under 40 CFR 268.30.

EPA Code(s)	Waste Description and Treatment/Regulatory Subcategory	Hazardous Constituent	Total Concentration in mg/l (WW), mg/kg (NWW); or Technology Code

B. Other Regulated Waste Notification

This section includes all wastes restricted from land disposal not included in other sections. If any treatment standards reference 268.48, then all underlying hazardous constituents are listed in Section D.

EPA Code(s)	Waste Description and Treatment/Regulatory Subcategory	Hazardous Constituent	Total Concentration in mg/l (WW), mg/kg (NWW); or Technology Code
D018	Wastes that are TC for Benzene based on the TCLP in SW846 Method 1311.	Benzene	10 and meet 268.48 standards

C. D001-D003

There are no D001-D003 restricted wastes present that are banned from land disposal.

EPA Code(s)	Waste Description and Treatment/Regulatory Subcategory	Hazardous Constituent	Total Concentration in mg/l (WW), mg/kg (NWW); or Technology Code

D: Underlying Hazardous Constituents

There are no underlying hazardous constituents present as defined in 268.2(i).

Hazardous Constituent	Total Concentration in mg/l (WW), mg/kg (NWW); or Technology Code

Land Disposal Restriction Form

COS International, Inc.

EPA ID #:NYD080336241

5600 Niagara Falls Blvd.

Niagara Falls, NY 14304-0340

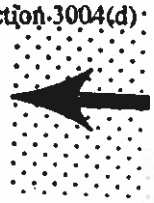
F. Non-Hazardous/Non-Restricted Waste

There are no EPA waste codes that are not subject to land disposal restrictions as specified in 40 CFR Subpart D or applicable prohibitions in 40 CFR 268.32 or RCRA.

Certifications

This waste must be treated to the applicable treatment standards set for in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d).

Signature _____ Date 5.2.03



NYG 3371535

Please type or print. Do not staple

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

STATE UNIVERSITY
ENV. HEALTH & SAFETY OFFICE

(Hazardous Waste Manifest 1/500)

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. NYD073669350 | Manifest Doc. No. 71535 | 2. Page 1 of 1 | Information in the heavy lined area is not required by Federal Law.

GENESEO, NEW YORK 14454-1452

3. Generator's Name and Mailing Address
SUNY GENESEO
1 COLLEGE CIRCLE
GENESEO NY 14454

4. Generator's Telephone Number (585) 245-5511

5. Transporter 1 (Company Name) ENVIRONMENTAL PRODUCTS & | 6. US EPA ID Number NYD980761191

7. Transporter 2 (Company Name) | 8. US EPA ID Number

9. Designated Facility Name and Site Address
CECOS INTERNATIONAL, INC.
5600 NIAGARA FALLS BLVD.
NIAGARA FALLS NY 14303

10. US EPA ID Number NYD080336241

A. NYG 3371535
B. Generator's ID SAME
C. State Transporter's ID
D. Transporter's Telephone (315) 471-0503
E. State Transporter's ID
F. Transporter's Telephone ( )
G. State Facility ID
H. Facility Telephone (716) 282-2676

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers Number	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ HAZARDOUS WASTE LIQUID, NOS (BENZENE), 9, NA3082, PGIII	001	TT	00239	GD	EPA STATE
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

ATTACHMENT 6

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above
a. 502 T | c. | b. | d.

15. Special Handling Instructions and Additional Information
IN CASE OF EMERGENCY: (585) 436-5660
WIS#8806 WO #285800

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name | Signature | Mo. 05 | Day 05 | Year 03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Mo. | Day | Year

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Mo. | Day | Year

FACILITY

19. Discrepancy Indication Space
Quantity Received = 3.38 tons

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name | Signature | Mo. 05 | Day 05 | Year 03

GENERATOR

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the NYS Department of Environmental Conservation (518) 457-7362

COPY 5—Generator—Mailed by TSD Facility

Restriction Form

Facility International, Inc. EPA ID #:NYD083336241

5600 Niagara Falls Blvd.

Niagara Falls, NY 14304-0340

Generator Information:
EPA ID #: NYD073669350
S.U.N.Y. @ Geneseo
1 College Circle

Geneseo, NY 14454

Site Information:
S.U.N.Y. @ Geneseo
1 College Circle

Geneseo, NY 14454

Billing Contact: Phone: (585) 245-5511
Technical Contact: Phone: (585) 245-5511

Name of Waste: Contaminated Groundwater Waste Codes: D018

State Manifest Number: NYG2887065 line item a

Federal Manifest Number:

Profile Number: 12541-AAB **LDR Nonwastewater Treatability Group**

A. F001-F005 Solvent Restrictions

There are no F001-F005 solvent restricted wastes present that are banned from land disposal under 40 CFR 268.30.

EPA Code(s)	Waste Description and Treatment/Regulatory Subcategory	Hazardous Constituent	Total Concentration in mg/l (WW mg/kg (NWW); or Technology C

B. Other Regulated Waste Notification

This section includes all wastes restricted from land disposal not included in other sections. If any treatment standards reference 268.48, then all underlying hazardous constituen are listed in Section D.

EPA Code(s)	Waste Description and Treatment/Regulatory Subcategory	Hazardous Constituent	Total Concentration in mg/l (WW mg/kg (NWW); or Technology C
D018	Wastes that are TC for Benzene based on the TCLP in SW846 Method 1311.	Benzene	10 and meet 268.48 standards

C. D001-D003

There are no D001-D003 restricted wastes present that are banned from land disposal.

EPA Code(s)	Waste Description and Treatment/Regulatory Subcategory	Hazardous Constituent	Total Concentration in mg/l (WW mg/kg (NWW); or Technology C

D: Underlying Hazardous Constituents

There are no underlying hazardous constituents present as defined in 268.2(i).

Hazardous Constituent	Total Concentration in mg/l (WW mg/kg (NWW); or Technology C

...nstruction Form

...International, Inc.

EPA ID #:NYD080336241

5600 Niagara Falls Blvd.

Niagara Falls, NY 14304-0340

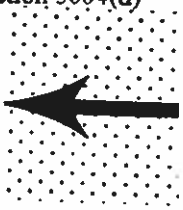
F. Non-Hazardous/Non-Restricted Waste

There are no EPA waste codes that are not subject to land disposal restrictions as specified in 40 CFR Subpart D or applicable prohibitions in 40 CFR 268.32 or RCRA.

Certifications

This waste must be treated to the applicable treatment standards set for in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d)

Signature _____ Date 05.05.03



ATTACHMENT 7

Environmental Data Resources, Inc.

The EDR Radius Map
with GeoCheck®

SUNY Geneseo-Park St Parking Facility
#4 and #6 Park Street
Geneseo, NY 14454

Inquiry Number: 0906581.1r

January 06, 2003

***The* Source For Environmental Risk Management Data**

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

EXECUTIVE SUMMARY

STATE OR LOCAL ASTM SUPPLEMENTAL

SPILLS: Data collected on spills reported to NYSDEC. is required by one or more of the following: Article 12 of the Navigation Law, 6 NYCRR Section 613.8 (from PBS regs), or 6 NYCRR Section 595.2 (from CBS regs). It includes spills active as of April 1, 1986, as well as spills occurring since this date.

A review of the NY Spills list, as provided by EDR, has revealed that there are 7 NY Spills sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SUNY GENESEO	1 PARK PLACE	0 - 1/8 ESE	1	6
MARQUART (TJ) & SONS	ROUTE 20 / ROUTE 39	0 - 1/8 SE	B8	14

Lower Elevation	Address	Dist / Dir	Map ID	Page
SUNY GENESEO POWER PLANT	1 COLLEGE CIRCLE	0 - 1/8 W	A2	7
CLARK BUILDING	1 COLLEGE CIRCLE	0 - 1/8 W	A3	8
SUNY GENESEO UNION BLDG	1 COLLEGE DRIVE	0 - 1/8 W	A4	9
NEWTON BUILDING	1 COLLEGE CIRCLE	0 - 1/8 W	A5	11
SUNY GENESEO CLARK BLDG	1 COLLEGE CIRCLE	0 - 1/8 W	A6	12

PROPRIETARY DATABASES

Former Manufactured Gas (Coal Gas) Sites:

The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative

A review of the Coal Gas list, as provided by EDR, has revealed that there is 1 Coal Gas site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
GENESEO GAS LIGHT CO.	BEHIND NORMAL ST.	1/2 - 1 NE	18	39

LIVINGSTON COUNTY SHERIFF (Continued) **S101508586**

Last Date: 09/29/1994
Num Times Material Entry In File: 21329
DEC Remarks: 12/04/81: DOT USING ABSORBENT PADS.
Spill Cause: WHILE REMOVING COUNTY GAOLINE TANK UNDERGROUND), A JOINT BROKE SPILLING FUEL.

18
NE
1/2-1
2730 ft.
Higher

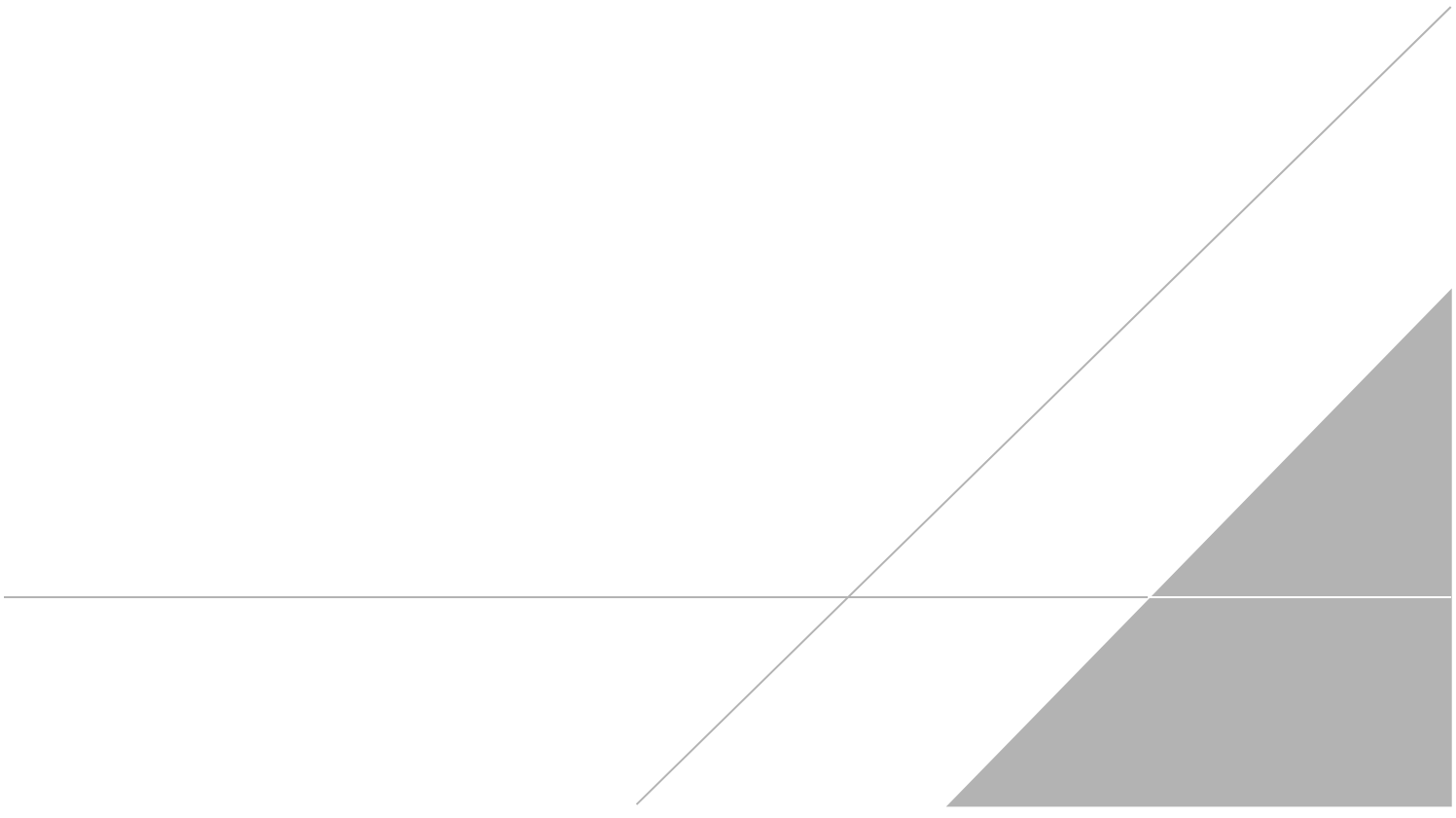
GENESEO GAS LIGHT CO.
BEHIND NORMAL ST.
GENESEO, NY 14454

Coal Gas **G000000551**
N/A

COAL GAS SITE DESCRIPTION:
Site is in the center of the block formed by Main St. to the east, Normal to the north, Wadsworth to the west and Park to the south. Site is gone by 1910.

Appendix D

Excavation Work Plan

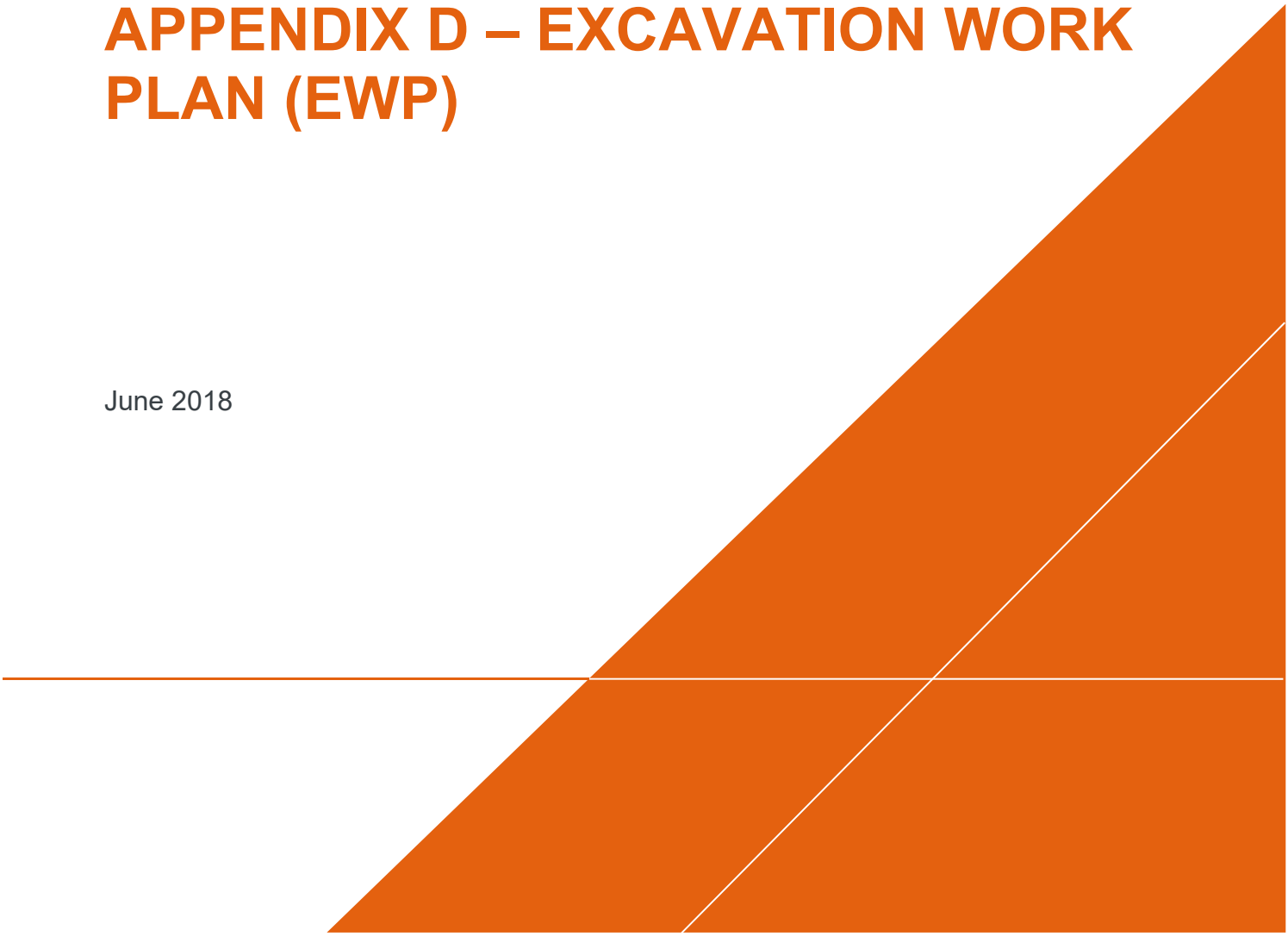


ARCADIS Design & Consultancy for natural and built assets

RG&E

SITE MANAGEMENT PLAN APPENDIX D – EXCAVATION WORK PLAN (EWP)

June 2018



SITE MANAGEMENT PLAN APPENDIX D – EXCAVATION WORK PLAN (EWP)

Prepared for:

RG&E

Prepared by:

Arcadis of New York, Inc.

295 Woodcliff Drive

Third Floor

Suite 301

Fairport

New York 14450

Tel 585 385 0090

Fax 585 385 4198

Our Ref.:

B0013138.0004

Date:

June 2018

CONTENTS

TABLES

This Excavation Work Plan (EWP) has been prepared to support the Site Management Plan (SMP) for the former manufactured gas plant (MGP) site of a predecessor of Rochester Gas and Electric Corporation (RG&E) located at the 4 and 6 Park Street properties of the State University of New York (SUNY) in the Village of Geneseo, New York (site). An interim remedial measure (IRM) was completed at the site to the satisfaction of the New York State Department of Environmental Conservation (NYSDEC) that removed source materials and soil containing visual impacts, and/or exceedances of the site-specific cleanup levels of polycyclic aromatic hydrocarbons (PAHs) in soil greater than 500 milligrams per kilogram (mg/kg), and total benzene, toluene, ethylbenzene, and xylenes (BTEX) greater than 10 mg/kg. However, MGP-related contamination, i.e., subsurface soil containing MGP-related residuals above Unrestricted Use Soil Cleanup Objectives (SCOs) set forth in 6 NYCRR 375-6.8(a), could potentially exist at depths greater than approximately 4-feet below ground surface (bgs).

1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining MGP contamination, SUNY as the site owner or its representative will notify RG&E and the NYSDEC. Table E-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 Table 1-1 and Table 1-2 of the SMP.

Table 1. Notifications*

Contact Name/Address	Phone Number/Email
Jeremy Wolf Manager - Programs and Projects RG&E 1300 Scottsville Road Rochester, NY 14624	Telephone: (585) 724-8548 Email: Jeremy_wolf@rge.com
Mr. Amen Omorogbe, P.E. NYSDEC 625 Broadway Albany, New York 12233	Telephone: 518.402.9662 Email: amen.omororogbe@dec.ny.gov

* 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 (if necessary), intrusive elements or utilities to be installed below the soil cover, estimated volumes of potentially MGP-impacted soil to be excavated and any work that may impact an engineering control
- A summary of environmental conditions anticipated to be encountered in the work areas
- 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 and 29 CFR 1910.120;
- A copy of the contractor's task-specific health and safety plan (HASP), in electronic format. The contractor may use the Generic HASP (GHASP) provided in Appendix G of the SMP as a template; however, the contractor must have a qualified safety professional prepare and sign their task-specific HASP and verify OSHA requirements and protocols are current.
- Identification of disposal facilities for potential waste streams
- Identification of sources of any anticipated backfill, along with all required chemical testing results

2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potential MGPcontaminated material (remaining MGP contamination). 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 Certificate of Completion.

Soil excavated from within the site will be segregated based on previous environmental data and screening results into material that potentially 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. Soil/fill excavated from depths greater than 5 feet bgs that is potentially suitable for reuse will be sampled and analyzed (as described in Section 7 of this EWP) to evaluate whether the material can be replaced or must be transported off-site for treatment and/or disposal.

3 SOIL STAGING METHODS

Stockpiles of excavated material will, at minimum, be placed on top of polyethylene sheeting. If required by NYSDEC, stockpiles of excavated material shall be placed within an engineered staging area. Stockpiles will be covered using polyethylene sheeting/tarps to reduce potential infiltration of precipitation, migration of wind-blown dust, and direct contact exposures. Stockpiles will be kept covered at all times with appropriately anchored tarps when not in use. The stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced. During soil disturbance activities, erosion and sedimentation control measures shall be employed in accordance with this EWP and in conformance with applicable laws and regulations (good work practices that require erosion and sedimentation control measures are not limited to potentially impacted areas). Proven soil conservation practices shall be incorporated in any such plans to mitigate soil erosion, off-site sediment migration, and water pollution from erosion. Appropriate temporary erosion control measures (e.g., silt fencing, hay bales) shall be implemented and maintained around all impacted and potentially impacted soil/fill stockpiles and un-vegetated soil surfaces during such activities. Such stockpiles shall be graded and compacted as necessary for positive surface water runoff and dust control. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

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.

4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work that will be greater than 4 feet in depth (as described in Section 2 of the SMP), and the excavation and load-out of all excavated material from a depth greater than 4 feet bgs, if required. SUNY and RG&E are responsible for the implementation of this EWP. The contractors performing the work are solely responsible for safe execution of all invasive and other work performed under this EWP.

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.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded, as required, in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

When necessary, a truck wash will be operated on-site, as appropriate. The qualified environmental professional, or designated individual under his/her direction, 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. The qualified environmental professional, or designated individual, will be responsible for ensuring that all outbound trucks will be washed (as necessary) 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. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

5 MATERIALS TRANSPORT OFF-SITE

All transportation 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, as required.

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

Truck transport routes for vehicles leaving the property with material destined for off-site treatment and/or disposal are as follows:

- For Destinations Located to the South:
  - Follow the access road south to Park Street
  - Turn left onto Park Street
  - Turn right onto Main Street
  - Turn left onto South Street to East South Street (Route 20A)
  - Turn left onto NYS Route 390 South
- For Destinations Located to the North:
  - Follow the access road south to Park Street
  - Turn left onto Park Street
  - Turn right onto Main Street
  - Turn left onto South Street to East South Street (Route 20A)
  - Turn left onto NYS Route 390 North

All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. These are the most appropriate routes and take 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 activities. Queuing of trucks will be performed on-site whenever possible to minimize off-site disturbance.

6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste removed from potentially impacted areas of the site (i.e., greater than 4 feet bgs) that are not returned to the excavation will be treated as impacted and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from the 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. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site treatment and/or disposal locations for excavated soil 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 recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report (described in Section 5 of the SMP). This documentation will include: waste profiles (if required), laboratory analytical test results, facility acceptance letters, manifests, bills of lading and facility receipts, as appropriate.

Non-hazardous historic fill and contaminated soil excavated from depths greater than 4 feet bgs taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted Soil Cleanup Objectives (SCOs) is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

7 MATERIALS REUSE ON-SITE

Excavated material located above potentially impacted material (i.e., clean fill material that was imported from off-site) can be reused for on-site fill.

Excavated soil/fill from any potentially impacted depth, e.g., excavated from depths greater than 4 feet bgs, that is free of visible tar or oil, sheens, and/or obvious odors shall be considered potentially suitable for on-site reuse. Material potentially suitable for on-site reuse shall be placed on polyethylene sheeting in stockpiles not to exceed 250 cubic yards (CY). The stockpiled potentially reusable material shall be covered whenever soil is not actively being placed into or removed from the stockpile, during overnight/weekend hours, during periods of precipitation, or whenever dust action levels are exceeded. This material shall be covered using polyethylene sheeting to reduce potential infiltration of precipitation, migration of wind-blown dust, and direct contact exposures.

Stockpiled potentially reusable material from potentially impacted areas will be sampled and analyzed to verify the material can be replaced beneath cover materials, or must be transported for off-site disposal. One composite sample will be collected for each 250 CY of potentially impacted soil, or as required by the disposal facility. As indicated in the Generic Quality Assurance Project Plan (Generic QAPP) included as Appendix F to the SMP, one duplicate sample will also be collected for every 20 samples, with a minimum of one duplicate per sample delivery group (SDG), or as required by the disposal facility. Each composite sample will be formed using individual grab samples collected from five locations within each stockpile (i.e., five discrete grab samples per composite). The composite sample will be formed by placing equal portions of soil from each of the five discrete grab sampling locations into a pre-cleaned, stainless steel bowl (or dedicated container). The composite sample will be thoroughly homogenized using a stainless-steel scoop or trowel before being transferred into the sample containers provided by the laboratory. The filled sample containers must be labeled and transported to the laboratory using a chain-of-custody form. Each sample will be submitted for laboratory analysis for PAHs and BTEX. Material suitable for reuse must meet the reuse criteria specified for restricted residential use in 6 NYCRR Part 375-6.8(b) and NYSDEC's DER-10: Technical Guidance for Site Investigation and Remediation (DER-10).

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable excavated material, if any, does not get used as backfill or otherwise 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.

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.

8 FLUIDS MANAGEMENT

Efforts shall be made to minimize the amount of water that could enter an excavation (e.g., installing a berm around the excavation or covering the excavation to prevent runoff from entering during precipitation). Water accumulated in excavations shall be pumped out during or after precipitation events (as appropriate), containerized, characterized, and appropriately disposed.

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 in accordance with applicable local, State, and Federal regulations. At a minimum, water encountered in excavations shall be containerized then sampled and analyzed for the chemicals of potential concern (COCPs) known to be in the area as determined by previous analytical results, which may include certain volatile organic compounds (VOCs) and PAHs, as well as analytes required by potential off-site treatment/disposal facilities. Water shall be discharged to the local sewer authority (if authorized), transported off-site for proper disposal, or treated on-site via a treatment system, as appropriate. 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.

9 COVER SYSTEM RESTORATION

After the completion of soil removal or other invasive activities that require removal of site cover materials, the site cover materials will be restored in a manner that complies with the August 2017 Decision Document. The existing cover materials are comprised of asphalt pavement (i.e., parking lot and access road), concrete covered sidewalks and a small landscaped area. A demarcation layer, consisting of orange snow fencing material, white geotextile, or equivalent material will be placed above excavation areas to provide a visual reference to the top of the zone containing potential MGP-related impacts, i.e., the zone that requires adherence to special conditions for disturbance of remaining potentially impacted soil defined in the 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 MGP contamination areas. A figure showing the modified surface will be included in the subsequent Annual Periodic Review Report and in an any updates to the SMP.

10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will comply with provisions in this SMP prior to receipt at the site.

Imported material shall be sampled in accordance with the frequency requirements presented in Table 5.4(e) of NYSDEC's DER-10. Imported material to be used at the site shall meet the Restricted Residential Use SCOs set forth in 6 NYCRR 375-6.8(b) and the levels presented in DER-10, Appendix 5.

If topsoil is used in areas for the final cover it shall be fertile, friable, natural loam surface soil, capable of sustaining plant growth, and free of clods or hard earth, plants or roots, sticks or other extraneous material that could discourage plant growth. Topsoil shall be seeded with a sustainable perennial mixture and appropriate erosion control measures shall be taken until the perennial grass/vegetation is established as also described in the remedial design report.

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.

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

All imported soil will meet the backfill and cover soil quality standards established in 6NYCRR Part 375-6.7(d). 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 375-6.8(b) of 6 NYCRR Part 375. Soil that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. 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.

11 STORMWATER POLLUTION PREVENTION

General storm water pollution prevention activities to be conducted in support of excavation activities include the following:

- Check dams/barriers (e.g., synthetic, stone, hay bales, etc.) 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. Necessary repairs shall be made immediately.
- Accumulated sediments will be removed as required to keep the barrier and/or hay bale check functional. Any 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 sufficient to prohibit storm water from migrating off site or to sewers.

12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other a previously unidentified contaminant source is found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product and surrounding soil, 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 VOCs and SVOCs, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone 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 Annual Periodic Review Report (PRR) prepared pursuant to Section 7 of the SMP.

13 COMMUNITY AIR MONITORING PLAN

Community air monitoring for VOCs and particulates will be conducted for soil disturbance activities within potentially impacted areas, in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP) included as Appendix H to the SMP. The quantity and locations of community air monitoring stations will be determined in conjunction with the NYSDOH, based on the size and location of the proposed excavation and prevailing wind direction; however, at a minimum there will be one upwind and one downwind monitoring location. 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. Similarly, depending on the size and location of the proposed excavation area, the need for a fixed monitoring station adjacent to the Brodie Fine Arts building located to the west of the Site will be evaluated, regardless of wind direction.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers. CAMP monitoring results will be included in the first subsequent PRR.

14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors from the site. Specific odor control methods to be used on a routine basis are discussed below and included in the NYSDOH Generic CAMP included as Appendix H to the SMP. 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 RG&E's Remediation Engineer, and any measures that are implemented will be discussed in the Annual PRR.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include:

- limiting the area of open excavations and size of soil stockpiles
- shrouding open excavations with tarps and other covers
- using foams to cover exposed odorous soils

If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include:

- direct load-out of soils to trucks for off-site disposal
- use of chemical odorants in spray or misting systems
- 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.

15 DUST CONTROL PLAN

Dust (i.e., particulate) monitoring will be performed in accordance with the CAMP included as Appendix H to the SMP. A dust suppression plan that addresses dust management during invasive on-site work within area identified as potentially containing MGP-related impacts, i.e., depths below 4 feet bgs, will include, at a minimum, the items listed below:

- Dust suppression will be achieved through use of 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
- Excavation of large areas will be done in stages to limit the area of exposed soil vulnerable to dust production
- Gravel will be used on unpaved construction roadways to provide a clean and dust-free road surface
- On-site construction roads will be limited in total area to minimize the area required for water truck sprinkling

16 OTHER NUISANCES

Noise monitoring will not be required during routine monitoring and maintenance activities presented in the SMP. If required, based on the nature of the excavation work being conducted (e.g., prolonged excavation activities near the Brodie Hall Fine Arts building), a plan will be developed and utilized by the contractor to ensure compliance with local noise control ordinances.

Arcadis of New York, Inc.

295 Woodcliff Drive

Third Floor

Suite 301

Fairport, New York 14450

Tel 585 385 0090

Fax 585 385 4198

www.arcadis.com

Appendix E

Generic Field Sampling Plan

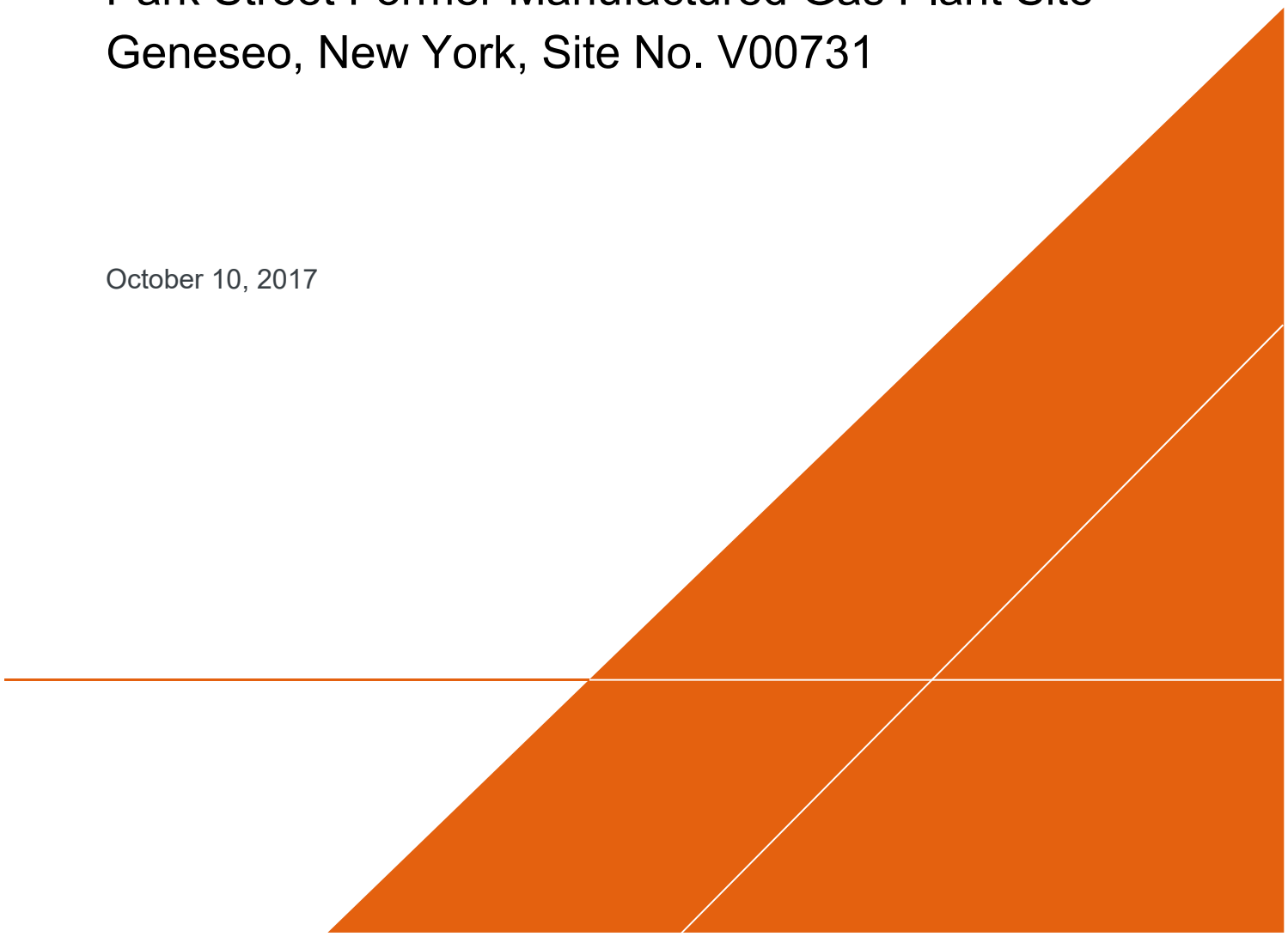
ARCADIS Design & Consultancy for natural and built assets

RG&E

APPENDIX E
GENERIC FIELD SAMPLING PLAN

Park Street Former Manufactured Gas Plant Site
Geneseo, New York, Site No. V00731

October 10, 2017



GENERIC FIELD SAMPLING PLAN

Park Street Former MGP Site
Geneseo, New York

Prepared for:

RG&E

Prepared by:

Arcadis of New York, Inc.
295 Woodcliff Drive
Suite 301
Fairport, New York 14450
Tel 585.662.0090
Fax 585.385.4198

Our Ref.:

B0013138.0004

Date:

October 2017

CONTENTS

ATTACHMENTS

1 INTRODUCTION

1.1 General

Any field sampling activities conducted within the Park Street Former MGP Site located in Geneseo, New York must be performed in compliance with a Contractor-prepared task-specific Field Sampling Plan (FSP). The Contractor will be responsible for preparing a task-specific FSP in compliance with DER-10 and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local rules and regulations.

This *Generic Field Sampling Plan* (GFSP) presents a **general guideline** for Contractors preparing the task-specific FSP; however, current site conditions must be considered, and specific site activities defined and evaluated. **Inclusion of this GFSP is for illustrative purposes only; this GFSP may not be used as a substitute for a Contractor-prepared FSP.**

The Contractor-prepared FSP should be used in conjunction with the New York State Department of Environmental Conservation- (NYSDEC-) approved SMP.

1.2 Overview of Field Activates

The Park Street SMP describes the required monitoring and maintenance tasks and their frequency. The general tasks include:

- Measuring water table elevations
- Recovering MGP-related non-aqueous phase liquid (NAPL)
- Collecting groundwater samples

The required sampling locations and rationale for each field sampling activity are described in the SMP.

For completeness, while not required by the SMP, subsurface soil sampling is also included in the event the need occurs.

2 FIELD ACTIVITIES

This section describes field procedures and methods potentially used for site investigation work.

2.1 General Field Guidelines

2.1.1 Utilities

Underground utilities will be identified prior to any drilling or intrusive work not identified in the SMP. Public and privately-owned utilities will be located by contacting responsible agencies by phone so that their underground utilities can be marked at the site. Other potential on-site hazards, such as traffic, overhead power lines, and building hazards, will be identified during a site reconnaissance visit.

2.1.2 Equipment

The following is a general list of equipment necessary for sample collection:

- Stainless steel spoons and bowls or single-use disposable zip-top plastic bags for compositing soil samples
- Appropriate sample containers provided by the laboratory (kept closed and in laboratory-supplied coolers until the samples are collected)
- Pre-preserved sample containers (as required) for aqueous samples
- Chain of custody record forms
- Log book, field sampling records, and indelible ink pens and markers
- Laboratory-grade soap (such as Alconox®), reagent grade solvents, and distilled water to be used for decontaminating equipment between sampling stations
- Buckets, plastic wash bins, and scrub brushes for decontaminating equipment
- Digital camera and extra batteries
- Stakes, pin flags, and/or spray paint to identify sampling locations
- Shipping labels and forms
- Safety auto-retract knife
- Packing/shipping material for sample bottles
- Strapping tape
- Clear plastic tape
- Duct tape
- Aluminum foil

- Portable field instruments, including a photoionization detector (PID), water quality parameter meter (capable of measuring pH, ORP, temperature, conductivity, and dissolved oxygen), turbidity meter, and water-level indicator

2.1.3 Field Book

Field log books will be maintained by the field team leader and other team members to provide a daily record of significant events, observations, and measurements during the field activities.

Information pertinent to the field activities and/or sampling activities will also be recorded in the log books. The books will be bound with consecutively numbered pages. Entries in the log book will include, at a minimum, the following information:

- Name of author, date of entry, and physical/environmental conditions during field activity
- Purpose of sampling activity
- Location of sampling activity
- Name of field crew members
- Name of any site visitors
- Sample media (e.g., soil, groundwater)
- Sample collection method
- Number and volume of sample(s) taken
- Description of sampling point(s)
- Volume of groundwater removed before sampling (where appropriate)
- Preservatives used
- Date and time of collection
- Sample identification number(s)
- Field observations
- Any field measurements made, such as, but not limited to, pH, temperature, conductivity, water level

All original data recorded in field log books and chain of custody records will be written with indelible ink. If an error is made on an original document assigned to one individual, that individual will make all corrections simply by crossing a single line through the error and entering the correct information. The erroneous information will not be erased. Any subsequent error discovered on an original document will be corrected by the person who made the entry. All subsequent corrections will be initialed and dated.

2.2 Sample Labeling, Packing, and Shipping

Each sample will be given a unique identification. With this type of identification, no two samples will have the same label.

Samples will be promptly labeled upon collection with the following information:

- Project number and site
- Unique sample identification
- Analysis required
- Date and time sampled
- Sample type (composite or grab)
- Preservative, if applicable

Clear tape will be secured over the sample label and the chain of custody will be initiated. A sample chain of custody form is included on **Attachment A**.

Appropriate sample containers, preservation methods, and laboratory holding times for each sample type will be applied as identified in the QAPP.

If samples are to be shipped by commercial carrier (e.g., Federal Express), sample bottles/jars will be packed in coolers containing the following:

- A drain plug (if present) that has been sealed with duct tape
- 1 to 2 inches of bubble wrap on the bottom of the cooler
- Water ice packaged in re-sealable plastic bags
- Sufficient bubble wrap to fill in the remaining area
- The completed chain of custody in a re-sealable plastic bag, taped in place on the inside cover of the cooler

The cooler will then be sealed with tape. Appropriate shipping labels, such as "this-end-up" and "fragile" stickers will be affixed to the cooler. Samples will be hand delivered or delivered by an express carrier within 48 hours of sample collection. The express carrier will not be required to sign the chain of custody form; however, the shipping receipt should be retained by the sampler and forwarded to the project files.

All samples, whether solids, liquids, or gases, being shipped by air or ground transport will be evaluated using a Shipping Determination process to determine if the material or equipment being shipped is hazardous for transport. All materials identified as HazMat will be shipped according to applicable United States Department of Transportation (USDOT) and International Air Transport Association (IATA) regulations and requirements. All employees collecting samples, preparing HazMat packages, or offering HazMat to a third-party carrier such as FedEx will have current HazMat training.

2.3 Equipment Decontamination

2.3.1 Drill Rig Decontamination

Drill rig decontamination is included in this FSP in the event that collection of subsurface soil is required.

A decontamination pad will be lined with plastic sheeting on a surface sloped to a sump. The sump must also be lined and of sufficient volume to contain approximately 20 gallons of decontamination water. All drilling equipment, including rear-end of drilling rig, augers, bits, rods, tools, split spoon samplers, tremie pipe, etc., will be cleaned on the decontamination pad with a high-pressure hot water "steam cleaner" unit and scrubbed with a wire brush, as needed, to remove dirt, grease, and oil before beginning work in the project area. If heavy accumulations of tars or oils are present on the downhole tools, a citrus-based cleaner (e.g., Citra-Solv®) may be used to aid in equipment cleaning. Tools, drill rods, and augers will be placed on sawhorses, decontaminated pallets, or polyethylene plastic sheets following steam cleaning. Direct contact with the ground will be avoided. The back of the drill rig and augers, rods, and tools will be decontaminated between each drilling location according to the above procedures. Decontamination water will be contained in a dedicated plastic tank or 55-gallon open-top drums located on site. All open-top drums will remain closed when not in use.

Following decontamination of all heavy site equipment, the decontamination pad will be decommissioned. The decommissioning will be completed by:

- Transferring the bulk of remaining liquids and solids into drums, tanks, and/or roll-offs to be provided by RG&E or the drilling subcontractor for these materials.
- Rolling the sheeting used in the decontamination pad onto itself to prevent discharge of remaining materials to the ground surface. Once rolled up, the polyethylene sheeting will be placed in the roll-off or drums used for disposal of personal protective equipment (PPE) and disposable equipment.

2.3.2 Sampling Equipment Decontamination

The following equipment will be required for use during sampling equipment cleaning procedures:

- Appropriate PPE, as required in the site HASP
- Distilled water
- Non-phosphate detergent such as Alconox (or equivalent)
- Tap water
- Rinsate collection plastic containers
- USDOT-approved waste shipping container(s)
- Brushes
- Large heavy-duty garbage bags
- Spray bottles
- (Optional) – “pesticide grade” Methanol
- (Optional) – “ultra-pure grade” Nitric Acid
- (Optional) – Hexane
- Ziploc-type bags

- Plastic sheeting

Prior to collecting samples to be submitted for chemical analysis, if any, all non-dedicated bowls, spoons, hand augers, bailers, and filtering equipment will be washed with potable water and a detergent (such as Alconox®). Decontamination may take place at the sampling location as long as all liquids are contained in pails and buckets. Sampling equipment will then be rinsed with potable water, followed by a 10 percent "pesticide-grade" methanol rinse, and finally a distilled water rinse. When sampling for inorganic constituents in an aqueous phase, an additional rinse step will be added prior to the rinse with methanol. The rinse step will entail a rinse with a 10 percent "ultra pure-grade" nitric acid followed by a distilled water rinse. Between rinses, equipment will be placed on polyethylene sheets or aluminum foil, if necessary. At no time will washed equipment be placed directly on the ground. Equipment will either be used immediately or wrapped in plastic or aluminum foil for storage or transportation from the designated decontamination area to the sampling location.

2.4 Soil Boring Advancement and Sample Collection

Where required, the following procedures will be used to advance borings.

2.4.1 Drilling and Geological Logging Methods

Drilling and geological logging methods to be completed for each soil boring are as follows:

- Boreholes in the overburden will be drilled using rotosonic technology, hollow-stem augers, direct-push technology (DPT) or other method identified in a NYSDEC-approved work plan.
- Continuous soil sampling will be conducted during advancement of soil borings. The drilling contractor or drill rig operator is responsible for obtaining accurate and representative samples; informing the supervising geologist of changes in drilling pressure; and keeping a separate general log of soils encountered.
- Split-spoon sampling and or Shelby tube sampling will be conducted during the advancement of soil borings for geotechnical data collection. Sampling will be performed in accordance with ASTM Specifications D1586 and D1587 for standard penetration test and split-spoon sampling and Shelby tube sampling, respectively, unless otherwise authorized by the field geologist.
- The designated field geologist will log borehole geology in the field book and/or field forms. Records will also be kept of occurrences of premature refusal due to boulders or construction materials that may have been used as fill. Where a boring cannot be advanced to the desired depth, the boring will be abandoned and an additional boring will be advanced at an adjacent location to obtain the required sample. Where it is desirable to avoid leaving vertical connections between depth intervals, the borehole will be sealed using cement and/or bentonite. Multiple refusals may lead to a decision by the supervising geologist to abandon that sampling location.
- A plywood sheet or tub may be placed around the drill stem when drilling to contain cuttings.
- Soil cuttings will be placed in a drum or roll-off; decontamination water will be placed in plastic tanks/drums. Soil cuttings and decontamination water will be picked up and containerized at the end

of each work day. Roll-offs or open-top drums used to contain the solids will be covered when not in use.

2.4.2 Subsurface Soil Sampling Method

Continuous soil sampling will be conducted during soil boring advancement in the overburden. At locations designated for geotechnical data collection, the Standard Penetration Test (American Society for Testing and Materials [ASTM] D 1586 84) and hollow-stem augers or flush-joint casing will be used during drilling to collect split-spoon samples from the unconsolidated fill and soil beneath the site.

The supervising geologist or scientist will be responsible for documenting drilling events using a bound field notebook to record all relevant information in a clear and concise format. The record of drilling events will include:

- start and finish dates of drilling
- name and location of project
- project number, client, and site location
- sample number and depths
- blow counts and recovery
- depth to water
- type of drilling method
- drilling equipment specifications, including the diameter of drilling tools
- documentation of any elevated organic vapor readings
- names of drillers, inspectors, or other people onsite
- weather conditions

Soil samples are typically field screened with an FID or PID at sites where volatile organic compounds are present in the subsurface. Field screening is performed using one of the following methods:

- Upon opening the sampler, the soil is split open and the PID or FID probe is placed in the opening and covered with a gloved hand. Such readings should be obtained at several locations along the length of the sample
- A portion of the collected sample is placed in a re-sealable plastic bag or jar, the PID or FID probe is placed inside the bag or jar which is closed as much as possible and a reading is obtained.

Samples selected for laboratory analysis will be handled, packed, and shipped in accordance with the procedures outlined in the this FSP. A geologist will be on-site during drilling and sampling operations to describe each soil sample on the soil boring log, including:

- percent recovery
- soil type

- color
- moisture condition
- density
- grain-size
- consistency
- other observations, particularly relating to the presence of potential impacts

Samples selected for laboratory analysis will be placed into appropriate containers provided by the laboratory. Sample containers for volatile organic analyses will be filled first. Soil samples collected for VOC analysis will be collected in a manner consistent with previous soil VOC analyses completed at the site to provide data comparability, if applicable (soil VOC samples will not be collected using methanol preservation or analyzed using United States Environmental Protection Agency Method 5035). Next, a sufficient amount of the remaining soil will be homogenized by mixing the sample in a decontaminated stainless-steel tray/bowl with a decontaminated stainless-steel trowel or disposable scoop. Alternatively, a disposable zip-top bag can be substituted for the stainless-steel tray/bowl. Laboratory-supplied sample containers for other analytes will then be filled. Duplicate samples will be collected at the frequency detailed in the QAPP by alternately filling two sets of sample containers.

Representative portions of each soil sample will be placed in a 1-pint jar or re-closable plastic bag, labeled, and stored on site. This container will be labeled with:

- Site
- Boring number
- Interval sampled
- Date
- Initials of sampling personnel

These soil samples will be screened for organic vapors using a PID. In addition, a geologist will be on site during drilling operations to describe each sample. Soil samples will be described using the methods described in the soil description standard operating procedure (SOP), included as **Attachment B**.

If required, samples selected for laboratory analysis will be based on:

- Their position in relation to potential source areas
- The visual presence of source materials
- The relative levels of volatile organics based on PID field screening measurements
- The discretion of the on-site geologist

For samples that may be submitted for chemical analysis, split-spoons, or any portion of the drilling rig that may contact the sample, will be decontaminated, as specified in Section 2.3.2, after each sample is collected. Sample descriptions, PID readings, and location will be recorded in the field book or on the

example field drilling log presented on **Attachment C**. The procedures to be followed will be dependent on the PID acquired for this project, as described in the equipment manual.

2.5 Measurement of Fluid Levels

The following procedure will be used to measure fluid-level depths at monitoring wells and surface-water gauges:

- Decontaminate the water-level probe or oil/water interface probe (for wells expected to contain NAPL).
- Measure the static fluid-level, fluid interfaces (i.e., NAPL/water interface), and sound the bottom of the well (if applicable) with reference to the surveyed elevation mark on the top of the PVC casing or surface-water gauge. Record all measurements to nearest 0.01 foot and record in the field book.

The measurements will be made in as short a timeframe as practical to minimize temporal fluctuations in hydraulic conditions.

Fluid levels will be measured using an electronic fluid-level indicator (sounder), steel tape, pressure transducer, or stream gauge at established reference points (e.g., top of casing, stream gauge).

The following materials will be available, as required:

- Appropriate health and safety equipment, as specified in the HASP.
- Laboratory-grade soap (Alconox or equivalent)
- Electronic water-level indicator (sounder) or pressure transducer.
- PID.
- Analyte-free water.
- Indelible ink pen.
- 6-foot engineer's rule

The following procedures will be used to obtain fluid levels.

1. Measure the lengths between markers on the cable with a 6-foot engineer's rule or a fiberglass engineer's tape. The tape or cable associated with the electronic water-level probe should be checked for the length corresponding to the deepest total well depth to be monitored during the data collection event.
2. If the length designations on the tape or cable associated with the electronic water-level probe are found to be incorrect, the probe will not be used until it is repaired by the manufacturer.
3. Record verification of this calibration process in field logbook.
4. The detailed procedure for obtaining fluid level depth measurements is as follows. Field notes on logs will be treated as secured documentation and indelible ink will be used. As a general rule, the order of measuring should proceed from the least to most contaminated monitoring wells, based on available data.

5. Identify site and well number in field logbook using indelible ink, along with date, time, personnel, and weather conditions.
6. Field personnel will avoid activities that may introduce contamination into monitoring wells. Activities such as dispensing gasoline into vehicles or generators should be accomplished well in advance of obtaining field measurements.
7. Use PPE as required by the Contractor-prepared task-specific HASP.
8. Clean the water-level probe and cable in accordance with the appropriate cleaning procedures. Down-hole instrumentation should be cleaned prior to obtaining readings at the first monitoring well and upon completion of readings at each well.
9. Clean the water-level probe and cable with a soapy (Alconox) water rinse followed by a solvent rinse (if appropriate based on site-specific constituents of concern) an analyte-free water rinse. Contain rinse water in a portable container that will be transferred to an on-site container.
10. Put clean plastic sheeting on the ground next to the well.
11. Unlock and open the well cover while standing upwind from the well. Place the well cap on the plastic sheeting.
12. Locate the measuring reference point on the well casing. If one is not found, initiate a reference point at the highest discernable point on the inner casing (or outer if an inner casing is not present) by notching with a hacksaw, or using an indelible marker. All down-hole measurements will be taken from the reference point established at each well on the inner casing (on the outer only if an inner casing is not present).
13. Measure to the nearest hundredth of a foot and record the height of the inner and outer casings (from reference point, as appropriate) to ground level.
14. Record the inside diameter of the well casing in the field log.
15. Lower the probe until it emits a signal (tone and or light) indicating the top of the water surface. Gently raise and lower the instrument through this interface to confirm its depth. Measure and record the depth of the water surface, and the total well depth, to the nearest hundredth of a foot from the reference point at the top of the well. Lower the probe to the bottom of the well to obtain a total depth measurement.
16. Clean the water-level probe and cable in accordance with the appropriate cleaning procedures.
17. Compare the depth of the well to previous records, and note any discrepancy.
18. Lock the well when all activities are completed.

Fluid level measurement data will be recorded legibly in the field notebook in indelible pen. Field situations such as apparent well damage or suspected tampering, or other observations of conditions that may result in compromised data collection will be photographically documented where practicable.

2.6 Groundwater Sampling Procedures for Grab Samples

This protocol describes procedures to be used to collect discrete or grab groundwater samples. For newly installed wells, no wells will be sampled until well development has been performed.

The following materials, as required, shall be available during groundwater sampling:

- Disposable Bailer.
- PID.
- Appropriate health and safety equipment, as specified in the task-specific HASP.
- Plastic sheeting (for each sampling location).
- New disposable polypropylene rope.
- Buckets to measure/contain purge water.
- Water-level probe.
- 6-foot rule with gradation in hundredths of a foot.
- Appropriate water sample containers.
- Appropriate blanks (trip blank supplied by the laboratory).
- Appropriate transport containers (coolers) with ice and appropriate labeling, packing, and shipping materials.
- Chain of custody forms.
- Indelible ink pens.
- Site map with well locations and groundwater contour maps.
- Keys to wells.

The following 15 steps detail monitoring well sampling procedures:

1. Identify site and well sampled in the field book, including date, arrival time, and weather conditions. Identify the personnel and equipment.
2. Label all sample containers using an appropriate label.
3. Use safety equipment, as required in the task-specific HASP.
4. Place plastic sheeting adjacent to the well to use as a clean work area.
5. Establish a background reading with the PID and record reading on the field log.
6. Remove lock from the well; if rusted or broken, replace with a new keyed-alike lock.
7. Unlock and open the well cover while standing upwind of the well. Remove well cap and place on plastic sheeting. Insert PID probe in the breathing zone above the well casing following instructions in the HASP.
8. Set out on plastic sheeting the dedicated or disposable sampling device and meters.

9. Prior to sampling, groundwater elevations will be measured at the monitoring well and the presence of LNAPL or DNAPL (if any) within the well will be evaluated. Obtain a water-level depth and bottom of well depth using an electric well probe and record on the sampling log sheet. Clean the well probe after each use with a soapy (Alconox®) water wash and a tap water rinse.
10. After groundwater elevations are measured and NAPLs are determined not to be present, the bailer will be lowered slowly into the well to the approximate mid-point of the saturated screened zone or the zone targeted for sample collection.
11. Obtain the groundwater sample needed for analysis directly from the bailer in the appropriate container and tightly screw on the cap.
12. Secure with packing material and store at 4 degrees Celsius (C) on wet ice in an insulated transport container provided by the laboratory.
13. Record the time sampling procedures were completed in the field book.
14. Place all disposable sampling materials (plastic sheeting, disposable bailers, and health and safety equipment) in appropriately labeled containers. Go to the next well and repeat Step 1 through Step 13 until all wells are sampled.
15. Complete the procedures for packaging, shipping, and handling with associated chain of custody forms (Section 2.2).

2.7 Low-Flow Groundwater Sampling Procedures for Monitoring Wells

This protocol describes procedures to be used to collect groundwater samples. For newly installed wells, no wells will be sampled until well development has been performed. During precipitation events, groundwater sampling will be discontinued until precipitation ceases. When a round of water levels is taken to generate water-elevation data, the water levels will be taken consecutively at one time prior to sampling or other activities.

The following materials, as required, shall be available during groundwater sampling:

- Sample pump.
- Sample tubing.
- Power source (i.e., generator, battery).
- PID.
- Appropriate health and safety equipment, as specified in the HASP.
- Plastic sheeting (for each sampling location).
- Dedicated or disposable bailers.
- New disposable polypropylene rope.
- Buckets to measure purge water.

- Water-level probe.
- 6-foot rule with gradation in hundredths of a foot.
- Conductivity/temperature meter.
- pH meter.
- Turbidity meter.
- Dissolved oxygen (DO) meter.
- Oxidation-reduction potential (ORP) meter.
- Appropriate water sample containers.
- Appropriate blanks (trip blank supplied by the laboratory).
- Appropriate transport containers (coolers) with ice and appropriate labeling, packing, and shipping materials.
- Groundwater sampling logs.
- Chain of custody forms.
- Indelible ink pens.
- Site map with well locations and groundwater contour maps.
- Keys to wells.

The following 20 steps detail the monitoring well sampling procedures:

1. Review materials list to confirm that the appropriate equipment has been acquired.
2. Identify site and well to be sampled on sampling log sheets, including date, arrival time, and weather conditions. Identify the personnel and equipment used and other pertinent data requested on the Field Sampling Logs (**Attachment D**).
3. Label all sample containers using an appropriate label.
4. Use safety equipment, as required in the HASP.
5. Place plastic sheeting adjacent to the well to use as a clean work area.
6. Establish the background reading with the PID and record the reading on the field log.
7. Remove lock from the well; if rusted or broken, replace with a new brass keyed-alike lock.
8. Unlock and open the well cover while standing upwind of the well. Remove well cap and place on the plastic sheeting. Insert PID probe in the breathing zone above the well casing following instructions in the HASP.
9. Set out on plastic sheeting the dedicated or disposable sampling device and meters.
10. Prior to sampling, groundwater elevations will be measured at each monitoring well and the presence of LNAPL or DNAPL (if any) within the well will be evaluated. Obtain a water-level depth and bottom

of well depth using an electric well probe and record on the sampling log sheet. Clean the well probe after each use with a soapy (Alconox®) water wash and a tap water rinse. (Note: water levels will be measured at all wells prior to initiating a sampling event).

11. After groundwater elevations are measured and NAPLs are determined not to be present, groundwater will be purged from the wells. If NAPLs are determined to be present, then a groundwater sample will not be collected; rather, a representative NAPL sample may be collected (if required) using a peristaltic pump or other method determined by the Field Manager/Site Supervisor.
12. Pump, safety cable, electrical lines, and/or tubing (for peristaltic pumps) will be lowered slowly into the well to a depth corresponding to the center of the saturated screen section of the well.
13. Measure the water level again with the pump in the well before starting the pump. Start pumping the well at 100 to 500 milliliters per minute. Ideally, the pump rate should cause little water-level drawdown in the well (less than 0.3 feet and the water level should stabilize). The water level should be monitored every 3 to 5 minutes (or as appropriate) during pumping. Care should be taken not to cause the pump suction to be broken or entrainment of air in the sample. Record pumping rate adjustments and depths to water. Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to avoid pumping the well dry and/or to confirm stabilization of indicator parameters. If the recharge rate of the well is very low, purging should be interrupted so as not to cause the drawdown within the well to advance below the pump. However, a steady flow rate should be maintained to the extent practicable. Sampling should commence as soon as the volume in the well has recovered sufficiently to permit sample collection.
14. During well purging, monitor the field indicator parameters (e.g., turbidity, temperature, specific conductance, pH, dissolved oxygen [DO], and oxidation-reduction potential [ORP]) every 3 to 5 minutes (or as appropriate). The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996):

    ±0.1 for pH

    ±3% for specific conductance (conductivity)

    ±10 mv for ORP

    ±10% for turbidity and DO

    Note that turbidity and DO usually require the longest time to achieve stabilization. As such, sampling may be allowed prior to stabilization of turbidity and/or DO if all other parameters have stabilized. The decision to sample under this scenario must be agreed to by the Project Manager.

    The pump must not be removed from the well between purging and sampling. If the parameters have stabilized, but the turbidity is not in the range of the 50 NTU goal, the pump flow rate should be decreased to no more than 100 millimeters per minute. Measurement of the indicator parameters should continue every 3 to 5 minutes. Measurements for parameters may be taken using a flow-thru cell or in a clean container such as a glass beaker. Measurements of DO should be taken from a sample collected using an in-line tee fitting installed before the tubing outlet, prior to connection to the flow-through cell (if one is being used).

15. Fill in the sample label and cover the label with clear packing tape to secure the label onto the container.
16. After the groundwater quality parameters have stabilized, as discussed above, obtain the groundwater sample needed for analysis directly from the sampling device in the appropriate container and tightly screw on the caps. Note that groundwater samples collected for analysis of VOCs cannot be collected using a peristaltic pump. If purging the well using a peristaltic pump, collect all other types of samples (e.g., SVOCs, inorganics, etc.) prior to collecting the sample for VOC analysis. Once other samples are collected, remove the peristaltic pump tubing and collect the VOC samples using a new disposable polyethylene bailer. The bailer should be gently lowered to the approximate depth at which the pump intake was set, and then retrieved.
17. Secure with packing material and store at 4 degrees Celsius (°C) on wet ice in an insulated transport container provided by the laboratory.
18. After all sampling containers have been filled, purge water for an additional few minutes. Check the calibration of the meters and then measure and record on the field log the physical appearance, pH, ORP, DO, temperature, turbidity, and conductivity.
19. Record the time sampling procedures were completed on the field logs.
20. Place all disposable sampling materials (plastic sheeting, disposable bailers, and health and safety equipment) in appropriately labeled containers. Go to the next well and repeat Step 1 through Step 20 until all wells are sampled.

    Complete the procedures for packaging, shipping, and handling with associated chain of custody forms (Section 2.2).

2.8 NAPL Bailing

In the event that NAPL is present during well gauging, it will be removed via appropriately sized bailers. Bailing will continue until there is no longer recoverable product retrieved in the bailer. Any material brought up in the bailer (groundwater and product) will be dumped into a bucket located immediately adjacent to the well. Upon completion of bailing of NAPL from a well, the bailed material will be transferred to an onsite storage container (e.g., 55-gallon drum) for staging pending disposal.

2.9 Air Monitoring

Air monitoring will be conducted during all intrusive activities and may require a PID and dust meter or only a PID. Specific air monitoring requirements that need to be conducted during intrusive activities are provided in the SMP. The PID will be used to monitor organic vapors in the breathing zone and borehole and to screen samples for analysis.

PID readings will be recorded in the field book during trenching and drilling activities. The instrument will be calibrated at least once each day and more frequently, if needed. A detailed procedure for the PID calibration is included in Section 3.1.

2.10 Investigation Derived Waste and Storage

Investigation-derived wastes (IDW) will be generated during site activities, which include, but are not limited to groundwater sampling, NAPL purging, and decontamination. IDW may include decontamination liquids, PPE, sorbent materials, purge water, recovered NAPLs and disposable sampling materials that may have come in contact with potentially impacted materials. IDW will be collected and staged at the point of generation. Waste materials will be analyzed for constituents of concern to evaluate proper disposal methods. Anticipated IDW will be labeled and stored in 55-gallon drums with bolt-sealed lids. Disposable equipment (PPE and disposable sampling equipment) typically does not require laboratory analysis.

Minimization of IDW will be considered by the Project Manager and may include techniques such as replacing solvent based cleaners with aqueous-based cleaners for decontamination of equipment, reuse of equipment (where it can be decontaminated), and sampling techniques that generate little waste.

The procedures for handling IDW are based on the USEPA's *Guide to Management of Investigation Derived Wastes* (USEPA, 1992). IDW is assumed to be contaminated with the site residuals until analytical evidence indicates otherwise. IDW will be managed to ensure the protection of human health and the environment and will comply with all applicable or relevant and appropriate requirements (ARARs). The following Laws and Regulations on Hazardous Waste Management are possible ARARs for this Site.

- 6 New York Codes, Rules, and Regulations (6 NYCRR) Part 364 "Waste Transporter Permits", Part 371 "Identification and Listing of Hazardous Wastes", and Part 372 "Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities".
- Resource Conservation and Recovery Act 42 USC Part 6901-6987
- Comprehensive Environmental Response, Compensation and Liability Act 42 USC Part 9601-9675
- Superfund Amendments and Reauthorization Act
- DOT Hazardous Materials Transportation

Waste characterization will be conducted in accordance with waste hauler, waste handling facility, and state/federal requirements following the laboratory requirements and methodologies outlined in the QAPP. IDW will be analyzed by methods appropriate for the known constituents that have been historically detected in the monitoring wells. In the unexpected event that the IDW is

In the unexpected event that IDW is characterized as a hazardous waste (as defined in 6 NYCRR Part 371), RCRA and DOT requirements must be followed for packaging, labeling, transporting, storing, and record keeping as described in Title 40 of the Code of Federal Regulations Part (40 CFR) Part 262 and 49 CFR Part 171-178. Waste material classified as RCRA non-hazardous may be handled and disposed of as an industrial waste.

These procedures may be varied or changed as required, dependent upon site conditions, equipment limitations, or limitations imposed by the procedure. The ultimate procedure employed will be documented in the project work plans or reports. If changes to the sampling procedures are required due to unanticipated field conditions, the changes will be discussed with the Project Manager and RG&E as soon as practicable and documented in the Periodic Review Report.

The following materials, as required, shall be available for IDW handling and storage:

- Appropriate PPE as specified by the task-specific HASP
- 55-gallon steel drums, DOT 1A2 or equivalent
- 15/16-inch socket wrench
- Hammer
- Leather gloves
- Drum dolly
- Appropriate drum labels (outdoor waterproof self-adhesive)
- Polyethylene storage tank
- Appropriate labeling, packing, chain-of-custody forms, and shipping materials
- Indelible ink and/or permanent marking pens
- Plastic sheeting
- Digital camera
- Field Logbook

2.10.1 Drum Storage

All 55-gallon drums will be stored at a secure, centralized onsite location that is readily accessible for vehicular pick-up. Drums confirmed as, or believed to contain hazardous waste will be stored over an impervious surface provided with secondary containment. The storage location will, for drums containing liquid, have a containment system that can contain at least the larger of 10% of the aggregate volume of staged materials or 100% of the volume of the largest container. Drums will be closed during storage and be in good condition in accordance with the USEPA's 1992 *Guide to Management of Investigation-Derived Wastes*.

2.10.2 Drum Container Labelling

Drums will be labeled on both the side and lid of the drum using a permanent marking pen. Old drum labels must be removed to the extent possible, descriptions crossed out should any information remain, and new labels affixed on top of the old labels. Other containers used to store various types of waste (polyethylene tanks, roll-off boxes, end-dump trailers, etc.) will be labeled with an appropriate "Waste Container" or "Testing in Progress" label pending characterization. Drums and containers will be labeled as follows:

- Appropriate waste characterization label (Testing In Progress, Hazardous, or Non-Hazardous)
- Waste generator's name (e.g., client name)
- Project name

- Name and telephone number of Arcadis project manager
- Composition of contents (e.g., used oil, acetone 40%, toluene 60%)
- Media (e.g., solid, liquid)
- Accumulation date (i.e., date the waste is first placed in the container)
- Drum number of total drums as reconciled with the Drum Inventory maintained in the field log book

Immediately upon placing waste into the drum/container, an appropriate waste label will be filled out to include the information specified above, and affixed to the container. Containers with waste determined to be non-hazardous will be labeled with a green and white "Non-Hazardous Waste" label over the "Waste Container" label. Containers with waste determined to be hazardous will be stored in an onsite storage area and will be labeled with the "Hazardous Waste" label and affixed over the "Waste Container" label. DOT hazardous class labels must be applied to all hazardous waste containers for shipment offsite to an approved disposal or recycling facility. In addition, a DOT proper shipping name shall be included on the hazardous waste label. The transporter should be equipped with the appropriate DOT placards. However, placarding or offering placards to the initial transporter is the responsibility of the generator per 40 CFR Part 262.33.

2.10.3 Inspection and Documentation

All IDW will be documented as generated on a Drum Inventory Log maintained in the field log book. The Drum Inventory will record the generation date, type, quantity, matrix and origin (e.g. RW-1 through RW-10, MW-97-7) of materials in every drum, as well as a unique identification number for each drum. The drum inventory will be used during drum pickup to assist with labeling of drums. Digital photographs will be taken upon the initial generation and drumming/staging of waste, and final labeling after characterization to document compliance with labeling and storage protocols, and condition of the container. Evidence of damage, tampering or other discrepancy should be documented photographically.

2.10.4 Preparing Waste Shipment Documentation (Hazardous and Non-Hazardous)

Waste profiles will be prepared by Arcadis and forwarded, along with laboratory analytical data to RG&E for approval/signature. RG&E will then return the profile to Arcadis who will then forward to the waste removal contractor for preparation of a manifest. The manifest will be reviewed by Arcadis prior to forwarding to RG&E for approval. Upon approval of the manifest, RG&E will return the original signed manifest directly to the waste contractor.

Different profile numbers will be generated for different matrices or materials in the drums. For example, the profile number for disposable equipment will be different than the profile number for purge water. When there are multiple profiles it is critical that the proper label, with the profile number appropriate to a specific material be affixed to the proper drums. A copy of the Arcadis drum inventory will be provided to the waste transporter during drum pickup and to the facility receiving the waste.

2.10.5 Emergency Response and Notifications

Specific procedures for responding to site emergencies will be detailed in the task-specific HASP. In the event of a fire, explosion, or other release which could threaten human health outside of the site or when the Contractor has knowledge of a spill that has reached surface water, RG&E must immediately notify the National Response Center (800-424-8802) in accordance with 40 CFR Part 262.34. Other notifications to state agencies may also be necessary.

3 FIELD INSTRUMENTS

All field-screening equipment will be calibrated immediately prior to each day's use and more frequently, if required. Additional calibration may be required if measurements appear erroneous. The calibration procedures will conform to the manufacturer's standard instructions. Records of all instrument calibration will be maintained by the field personnel. Copies of all of the instrument manuals will be maintained on site by the field personnel.

3.1 Portable Photoionization Analyzer

The photoionization analyzer (PID) will be a MiniRAE 3000 (or equivalent), equipped with a 10.6 electron volt (eV) lamp. The MiniRAE is capable of ionizing and detecting compounds with an ionization potential of less than 10.6 eV. Calibration will be performed according to the following procedures:

1. Turn on the MiniRAE 3000 and monitor the ambient air. If there is any doubt of the air quality, the ‘zero filter will be used.
2. Connect the regulator to the span gas cylinder. Hand-tighten the fittings.
3. Open the valve on the gas bag by turning the valve stem fully counterclockwise.
4. Attach the gas bag to the regulator. Hand-tighten the fittings.
5. Turn the regulator knob counterclockwise half a turn to start the gas flow.
6. Fill the gas bag half full and then close the regulator fully clockwise to turn off the flow of gas.
7. Fill the gas bag and then turn the valve clockwise.
8. Press “MODE” and “N” at the same time to enter the set-up screens. To cycle through the screens press “MODE.” Press “Y” for span cal and “Y” again for zero point. Press “Y” to set the zero point.
9. When screen displays “CAL GAS” press “Y” and calibrate the unit with isobutylene calibration gas.
10. Press and hold “MODE” for a few seconds and the display will return to normal screening mode.
11. After 7 hours of use, recharge the battery pack. Record the time the battery pack was charged.

Record the date, time, your initials, calibration gas, and concentration on a calibration; an example log is included as **Attachment E**.

3.2 pH Meter

The pH meter will be calibrated at the start of each day of use and after very high or low readings, as required by this FSP. National Institute of Standards and Technology traceable standard buffer solutions that bracket the expected pH range will be used. The standards will most likely be a pH of 7.0 and 10.0 standard units.

3.3 Specific Conductivity Meter

Calibration checks using the appropriate conductivity standard for the meter will be performed at the start of each day of use and after very high or low readings, as required by this FSP. Readings must be within 5 percent to be acceptable.

3.4 Dissolved Oxygen Meter

The DO meter will be calibrated and the condition of the DO sensor checked at the start of each day of use. Calibration and maintenance of the DO meter will be conducted in accordance with the manufacturer's specifications. The calibration data will be recorded in field notebooks.

3.5 Water-Level Meter

The water-level cable will be checked once to a standard to assess if the meter has been correctly calibrated by the manufacturer or vendor. If the markers are incorrect, the meter will be sent back to the manufacturer or vendor.

3.6 Turbidity Meter

The turbidity meter will be calibrated daily prior to use. Calibration and maintenance will be conducted in accordance with the manufacturer's specifications. Calibration and maintenance information will be recorded in the field notebook.

3.7 Oxidation-Reduction Potential Meter

The ORP meter will be calibrated at the start of each day of use. Calibration and maintenance of the ORP meter will be conducted in accordance with the manufacturer's specifications. The calibration data will be recorded in the field notebook.

ATTACHMENT A

Laboratory Chain of Custody

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page ___ of ___

Lab Work Order #

Send Results to:

Contact & Company Name: | Telephone:

Address: | Fax:

City | State | Zip | E-mail Address:

Project Name/Location (City, State): | Project #:

Sampler's Printed Name: | Sampler's Signature:

Preservative							
Filtered (✓)							
# of Containers							
Container Information							

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil | SE - Sediment | NL - NAPL/Oil
W - Water | SL - Sludge | SW - Sample Wipe
T - Tissue | A - Air | Other: _____

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	REMARKS

Special Instructions/Comments:

☐ **Special QA/QC Instructions(✓):**

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name:	Printed Name:	Printed Name:	Printed Name:
☐ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature:	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm:	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: _____	Date/Time:	Date/Time:	Date/Time:	Date/Time:

Distribution: **WHITE – Laboratory returns with results** **YELLOW – Lab copy** **PINK – Retained by Arcadis**

ATTACHMENT B

Soil Description Standard Operating Procedure

ARCADIS
Infrastructure, environment, facilities

Imagine the result

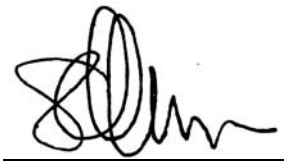
Soil Description

Rev. #: 0

Rev Date: May 20, 2008

Approval Signatures

Prepared by:  Date: 5/22/08

Reviewed by:  Date: 5/22/08
(Technical Expert)

Reviewed by  Date: 5/22/08
(Technical Expert)

I. Scope and Application

This ARCADIS standard operating procedure (SOP) describes proper soil description procedures. This SOP should be followed for all unconsolidated material unless there is an established client-required specific SOP or regulatory-required specific SOP. In cases where there is a required specific SOP, it should be followed and should be referenced and/or provided as an appendix to reports that include soil classifications and/or boring logs. When following a required non-ARCADIS SOP, additional information required by this SOP should be included in field notes with client approval.

This SOP has been developed to emphasize field observation and documentation of details required to:

- make hydrostratigraphic interpretations guided by depositional environment/geologic settings;
- provide information needed to understand the distribution of constituents of concern; properly design wells, piezometers, and/or additional field investigations; and develop appropriate remedial strategies.

This SOP incorporates elements from various standard systems such as ASTM D2488-06, Unified Soil Classification System, Burmister and Wentworth. However, none of these standard systems focus specifically on contaminant hydrogeology and remedial design. Therefore, although each of these systems contain valuable guidance and information related to correct descriptions, strict application of these systems can omit information critical to our clients and the projects that we perform.

This SOP does not address details of health and safety; drilling method selection; boring log preparation; sample collection; or laboratory analysis. Refer to other ARCADIS SOPS, the project work plans including the quality assurance project plan, sampling plan, and health and safety plan (HASP), as appropriate.

II. Personnel Qualifications

Soil descriptions will be completed only by persons who have been trained in ARCADIS soil description procedures. Field personnel will complete training on the ARCADIS soil description SOP in the office and/or in the field under the guidance of an experienced field geologist. For sites where soil descriptions have not previously been well documented, soil descriptions should be performed only by trained persons with a degree in geology or a geology-related discipline.

III. Equipment List

The following equipment should be taken to the field to facilitate soil descriptions:

- field book, field forms or PDA to record soil descriptions;
- field book for supplemental notes;
- this SOP for Soil Descriptions and any project-specific SOP (if required);
- field card showing Wentworth scale;
- Munsell® soil color chart;
- tape measure divided into tenths of a foot;
- stainless steel knife or spatula;
- hand lens;
- water squirt bottle;
- jar with lid;
- personal protective equipment (PPE), as required by the HASP; and
- digital camera.

IV. Cautions

Drilling and drilling-related hazards including subsurface utilities are discussed in other SOPs and site-specific HASPs and are not discussed herein.

Soil samples may contain hazardous substances that can result in exposure to persons describing soils. Routes for exposure may include dermal contact, inhalation and ingestion. Refer to the project specific HASP for guidance in these situations.

V. Health and Safety Considerations

Field activities associated with soil sampling and description will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities. Know what hazardous substances may be present in the soil and understand their hazards. Always avoid the temptation to touch soils with bare hands, detect odors by placing soils close to your nose, or tasting soils.

VI. Procedure

1. Select the appropriate sampling method to obtain representative samples in accordance with the selected sub-surface exploration method, e.g. split-spoon or Shelby sample for hollow-stem drilling, Lexan or acetate sleeves for dual-tube direct push, etc.

2. Proceed with field activities in required sequence. Although completion of soil descriptions is often not the first activity after opening sampler, identification of stratigraphic changes is often necessary to select appropriate intervals for field screening and/or selection of laboratory samples.

3. Examine all of each individual soil sample (this is different than examining each sample selected for laboratory analysis), and record the following for each stratum:

- depth interval;
- principal component with descriptors, as appropriate;
- amount and identification of minor component(s) with descriptors as appropriate;
- moisture;
- consistency/density;
- color; and
- additional description or comments (recorded as notes).

The above is described more fully below.

DEPTH

To measure and record the depth below ground level (bgl) of top and bottom of each stratum, the following information should be recorded.

1. Measured depth to the top and bottom of sampled interval. Use starting depth of sample based upon measured tool length information and the length of sample interval.

2. Length of sample recovered, not including slough (material that has fallen into hole from previous interval), expressed as fraction with length of recovered sample as numerator over length of sampled interval as denominator (e.g. 14/24 for 14 inches recovered from 24-inch sampling interval that had 2 inches of slough discarded).

3. Thickness of each stratum measured sequentially from the top of recovery to the bottom of recovery.

4. Any observations of sample condition or drilling activity that would help identify whether there was loss from the top of the sampling interval, loss from the bottom of the sampling interval, or compression of the sampling interval. Examples: 14/24, gravel in nose of spoon; or 10/18 bottom 6 inches of spoon empty.

DETERMINATION OF COMPONENTS

Obtain a representative sample of soil from a single stratum. If multiple strata are present in a single sample interval, each stratum should be described separately. More specifically, if the sample is from a 2-foot long split-spoon where strata of coarse sand, fine sand and clay are present, then the resultant description should be of the three individual strata unless a combined description can clearly describe the interbedded nature of the three strata. Example: Fine Sand with interbedded lenses of Silt and Clay, ranging between 1 and 3 inches thick.

Identify principal component and express volume estimates for minor components on logs using the following standard modifiers.

Modifier	Percent of Total Sample (by volume)
and	36 - 50
some	21 - 35
little	10 - 20
trace	<10

Determination of components is based on using the Udden-Wentworth particle size classification (see below) and measurement of the average grain size diameter. Each size grade or class differs from the next larger grade or class by a constant ratio of ½. Due to visual limitations, the finer classifications of Wentworth's scale cannot be distinguished in the field and the subgroups are not included. Visual determinations in the field should be made carefully by comparing the sample to the field gauge card that shows Udden-Wentworth scale or by measuring with a ruler. Use of field sieves s

recommended to assist in estimating percentage of coarse grain sizes. Settling test or wash method (Appendix X4 of ASTM D2488) is recommended for determining presence and estimating percentage of clay and silt.

Udden-Wenworth Scale Modified ARCADIS, 2008			
Size Class	Millimeters	Inches	Standard Sieve #
Boulder	256 – 4096	10.08+	
Large cobble	128 - 256	5.04 -10.08	
Small cobble	64 - 128	2.52 – 5.04	
Very large pebble	32 – 64	0.16 - 2.52	
Large pebble	16 – 32	0.63 – 1.26	
Medium pebble	8 – 16	0.31 – 0.63	
Small pebble	4 – 8	0.16 – 0.31	No. 5 +
Granule	2 – 4	0.08 – 0.16	No.5 – No.10
Very coarse sand	1 -2	0.04 – 0.08	No.10 – No.18
Coarse sand	½ - 1	0.02 – 0.04	No.18 - No.35
Medium sand	¼ - ½	0.01 – 0.02	No.35 - No.60
Fine sand	1/8 -¼	0.005 – 0.1	No.60 - No.120
Very fine sand	1/16 – 1/8	0.002 – 0.005	No. 120 – No. 230
Silt (subgroups not included)	1/256 – 1/16	0.0002 – 0.002	Not applicable (analyze by pipette or hydrometer)
Clay (subgroups not included	1/2048 – 1/256	.00002 – 0.0002	

Identify components as follows. Remove particles greater than very large pebbles (64-mm diameter) from the soil sample. Record the volume estimate of the greater than very large pebbles. Examine the sample fraction of very large pebbles and smaller particles and estimate the volume percentage of the pebbles, granules, sand, silt and clay. Use the jar method, visual method, and/or wash method (Appendix X4 of ASTM D2488) to estimate the volume percentages of each category.

Determination of actual dry weight of each Udden-Wentworth fraction requires laboratory grain-size analysis using sieve sizes corresponding to Udden-Wentworth fractions and is highly recommended to determine grain-size distributions for each hydrostratigraphic unit.

Lab or field sieve analysis is advisable to characterize the variability and facies trends within each hydrostratigraphic unit. Field sieve-analysis can be performed on selected samples to estimate dry weight fraction of each category using ASTM D2488 Standard Practice for Classification of Soils for Engineering Purposes as guidance, but replace required sieve sizes with the following Udden-Wentworth set: U.S. Standard sieve mesh sizes 6; 12; 20; 40; 70; 140; and 270 to retain pebbles; granules; very coarse sand; coarse sand; medium sand; fine sand; and very fine sand, respectively.

PRINCIPAL COMPONENT

The principal component is the size fraction or range of size fractions containing the majority of the volume. Examples: the principal component in a sample that contained 55% pebbles would be “Pebbles”; or the principal component in a sample that was 20% fine sand, 30% medium sand and 25% coarse sand would be “Fine to coarse Sand” or for a sample that was 40% silt and 45% clay the principal component would be “Clay and Silt”.

Include appropriate descriptors with the principal component. These descriptors vary for different particle sizes as follows.

Angularity – Describe the angularity for very coarse sand and larger particles in accordance with the table below (ASTM D-2488-06). Figures showing examples of angularity are available in ASTM D-2488-06 and the ARCADIS Soil Description Field Guide.

Description	Criteria
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

Plasticity – Describe the plasticity for silt and clay based on observations made during the following test method (ASTM D-2488-06).

- As in the dilatancy test below, select enough material to mold into a ball about ½ inch (12 mm) in diameter. Mold the material, adding water if necessary, until it has a soft, but not sticky, consistency.

- Shape the test specimen into an elongated pat and roll by hand on a smooth surface or between the palms into a thread about 1/8 inch (3 mm) in diameter. (If the sample is too wet to roll easily, it should be spread into a thin layer and allowed to lose some water by evaporation.) Fold the sample threads and reroll repeatedly until the thread crumbles at a diameter of about 1/8 inch. The thread will crumble when the soil is near the plastic limit.

Description	Criteria
Nonplastic	A $^{1}/_{8}$ inch (3 mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit

Dilatancy – Describe the dilatancy for silt and silt-sand mixtures using the following field test method (ASTM D-2488-06).

- From the specimen select enough material to mold into a ball about ½ inch (12 mm) in diameter. Mold the material adding water if necessary, until it has a soft, but not sticky, consistency.
- Smooth the ball in the palm of one hand with a small spatula.
- Shake horizontally, striking the side of the hand vigorously with the other hand several times.
- Note the reaction of water appearing on the surface of the soil.
- Squeeze the sample by closing the hand or pinching the soil between the fingers, and not the reaction as none, slow, or rapid in accordance with the table below. The reaction is the speed with which water appears while shaking and disappears while squeezing.

Description	Criteria
None	No visible change in the specimen.
Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear or disappears slowly upon squeezing.
Rapid	Water appears quickly on the surface of the specimen during shaking and disappears quickly upon squeezing.

MINOR COMPONENT(S)

The minor component(s) are the size fraction(s) containing less than 50% volume. Example: the identified components are estimated to be 60% medium sand to granules, 25 % silt and clay; 15 % pebbles – there are two identified minor components: silt and clay; and pebbles.

Include a standard modifier to indicate percentage of minor components (see Table on Page 5) and the same descriptors that would be used for a principal component. Plasticity should be provided as a descriptor for the silt and clay. Dilatancy should be provided for silt and silt-sand mixtures. Angularity should be provided as a descriptor for pebbles and coarse sand. For the example above, the minor constituents with

modifiers could be: some silt and clay, low plasticity; little medium to large pebbles, sub-round.

SORTING

Sorting is the opposite of grading, which is a commonly used term in the USCS or ASTM methods to describe the uniformity of the particle size distribution in a sample. Well-sorted samples are poorly graded and poorly sorted samples are well graded. ARCADIS prefers the use of sorting for particle size distributions and grading to describe particle size distribution trends in the vertical profile of a sample or hydrostratigraphic unit because of the relationship between sorting and the energy of the depositional process. For soils with sand-sized or larger particles, sorting should be determined as follows:

- Well sorted – the range of particle sizes is limited (e.g. the sample is comprised of predominantly one or two grain sizes)
- Poorly sorted – a wide range of particle sizes are present

You can also use sieve analysis to estimate sorting from a sedimentological perspective; sorting is the statistical equivalent of standard deviation. Smaller standard deviations correspond to higher degree of sorting (see Remediation Hydraulics, 2008).

MOISTURE

Moisture content should be described for every sample since increases or decreases in water content is critical information. Moisture should be described in accordance with the table below (percentages should not be used unless determined in the laboratory).

Description	Criteria
Dry	Absence of moisture, dry to touch, dusty.
Moist	Damp but no visible water.
Wet (Saturated)	Visible free water, soil is usually below the water table.

CONSISTENCY or DENSITY

This can be determined by standard penetration test (SPT) blow counts (ASTM D-1586) or field tests in accordance with the tables below. For SPT blow counts the N-value is used. The N-value is the blows per foot for the 6" to 18" interval. Example: for 24-inch spoon, recorded blows per 6-inch interval are: 4/6/9/22. Since the second interval is 6" to12", the third interval is 12" to 18", the N value is 6+9, or 15. Fifty blow counts for less than 6 inches is considered refusal.

Fine-grained soil – Consistency

Description	Criteria
Very soft	N-value < 2 or easily penetrated several inches by thumb.
Soft	N-value 2-4 or easily penetrated one inch by thumb.
Medium stiff	N-value 9-15 or indented about ¼ inch by thumb with great effort.
Very stiff	N-value 16-30 or readily indented by thumb nail.
Hard	N-value > than 30 or indented by thumbnail with difficulty

Coarse-grained soil – Density

Description	Criteria
Very loose	N-value 1- 4
Loose	N-value 5-10
Medium dense	N-value 11-30
Dense	N-value 31- 50
Very dense	N-value >50

COLOR

Color should be described using simple basic terminology and modifiers based on the Munsell system. Munsell alpha-numeric codes are required for all samples. If the sample contains layers or patches of varying colors this should be noted and all representative colors should be described. The colors should be described for moist

samples. If the sample is dry it should be wetted prior to comparing the sample to the Munsell chart.

ADDITIONAL COMMENTS (NOTES)

Additional comments should be made where observed and should be presented as notes with reference to a specific depth interval(s) to which they apply. Some of the significant information that may be observed includes the following.

- **Odor** - You should not make an effort to smell samples by placing near your nose since this can result in unnecessary exposure to hazardous materials. However, odors should be noted if they are detected during the normal sampling procedures. Odors should be based upon descriptors such as those used in NIOSH "Pocket Guide to Chemical Hazards", e.g. "pungent" or "sweet" and should not indicate specific chemicals such as "phenol-like" odor or "BTEX" odor.
- Structure
- Bedding planes (laminated, banded, geologic contacts)
- Presence of roots, root holes, organic material, man-made materials, minerals, etc.
- Mineralogy
- Cementation
- NAPL presence/characteristics, including sheen (based on client-specific guidance)
- Reaction with HCl (typically used only for special soil conditions)
- Origin, if known (capital letters: LACUSTRINE; FILL; etc.)

EXAMPLE DESCRIPTIONS

51.4 to 54.0' Clay, some silt, medium to high plasticity; trace small to large pebbles, subround to subangular up to 2" diameter; moist; stiff; dark grayish brown (10YR 4/2) NOTE: Lacustrine; laminated 0.01 to 0.02 feet thick, laminations brownish yellow (10 YR 4/3).

32.5 to 38.0' Sand, medium to Pebbles, coarse; sub-round to sub-angular; trace silt; poorly sorted; wet; grayish brown (10YR5/2). NOTE: sedimentary, igneous and metamorphic particles.

Unlike the first example where a density of cohesive soils could be estimated, this rotosonic sand and pebble sample was disturbed during drilling (due to vibrations in a loose Sand and Pebble matrix) so no density description could be provided. Neither sample had noticeable odor so odor comments were not included.

The standard generic description order is presented below.

- Depth

- Principal Components
    - Angularity for very coarse sand and larger particles
    - Plasticity for silt and clay
    - Dilatancy for silt and silt-sand mixtures
- Minor Components
- Sorting
- Moisture
- Consistency or Density
- Color
- Additional Comments

VII. Waste Management

Project-specific requirements should be identified and followed. The following procedures, or similar waste management procedures are generally required.

Water generated during cleaning procedures will be collected and contained onsite in appropriate containers for future analysis and appropriate disposal. PPE (such as gloves, disposable clothing, and other disposable equipment) resulting from personnel cleaning procedures and soil sampling/handling activities will be placed in plastic bags. These bags will be transferred into appropriately labeled 55-gallon drums or a covered roll-off box for appropriate disposal.

Soil materials will be placed in sealed 55-gallon steel drums or covered roll-off boxes and stored in a secured area. Once full, the material will be analyzed to determine the appropriate disposal method.

VIII. Data Recording and Management

Upon collection of soil samples, the soil sample should be logged on a standard boring log and/or in the field log book depending on Data Quality Objectives (DQOs) for the task/project. Two examples of standard boring logs are presented below.

The general scheme for soil logging entries is presented above; however, depending on task/project DQOs, specific logging entries that are not applicable to task/project goals may be omitted at the project manager's discretion. In any case, use of a consistent logging procedure is required.

Completed logs and/or logbook will be maintained in the task/project field records file. Digital photographs of typical soil types observed at the site and any unusual features should be obtained whenever possible. All photographs should include a ruler or common object for scale. Photo location, depth and orientation must be recorded in the daily log or log book and a label showing this information in the photo is useful.

ARCADIS Page ____ of ____

Sample Log

Well/Boring _____ Project Name and No. _____

Site Location _____ Drilling Started _____ Drilling Completed _____

Total Depth Drilled _____ feet Hole Diameter _____ inches Sampling Interval _____ feet

Length and Diameter of Sampling Device _____ Type of Sampling Device _____

Drilling Method _____ Drilling Fluid Used _____

Drilling Contractor _____ Driller _____ Helper _____

Prepared By _____ Hammer Weight _____ Hammer Drop _____ Inches

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)

http://team/Sites/Offices/North/Northeast Area/Northeast Area Geoscience Forms/Sample Core Log XLS - Sheet1

IX. Quality Assurance

Soil descriptions should be completed only by appropriately trained personnel. Descriptions should be reviewed by an experienced field geologist for content, format and consistency. Edited boring logs should be reviewed by the original author to assure that content has not changed.

X. References

ARCADIS Soil Description Field Guide, 2008 (in progress)

Munsell® Color Chart – available from Forestry Suppliers, Inc.- Item 77341 "Munsell® Color Soil Color Charts

Field Gauge Card that Shows Udden-Wentworth scale – available from Forestry Suppliers, Inc. – Item 77332 "Sand Grain Sizing Folder"

ASTM D-1586, Test Method for Penetration Test and Split-Barrel Sampling of Soils

ASTM D-2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

United States Bureau of Reclamation. Engineering Geology Field Manual. United States Department of Interior, Bureau of Reclamation. http://www.usbr.gov/pmts/geology/fieldmap.htm

Petrology of Sedimentary Rocks, Robert L. Folk, 1980, p. 1-48

NIOSH Pocket Guide to Chemical Hazards

Remediation Hydraulics, Fred C. Payne, Joseph A. Quinnan, and Scott T. Potter, 2008, p 59-63

ATTACHMENT C

Soil Boring Log

Date Start/Finish: 8/9/2008 - 8/10/2008
Drilling Company: Drillers, Inc.
Driller's Name: Joe Smith
Drilling Method: Hollow Stem Auger
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: 2" Split Spoon

Northing: 617984.1848
Easting: 559115.8392
Casing Elevation: NA

Borehole Depth: 26' bgs
Surface Elevation: 682.35' AMSL

Descriptions By: Katherine Murray

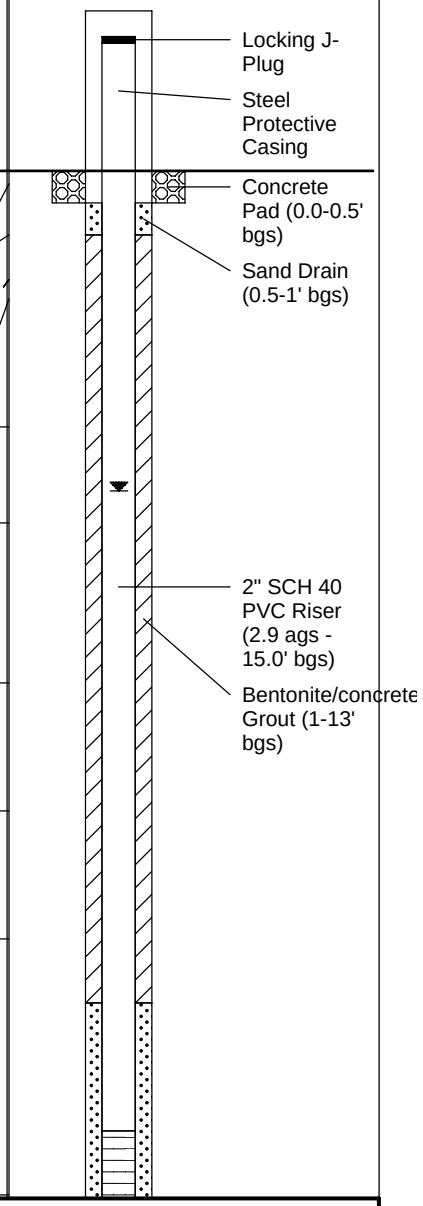
Well/Boring ID: **EXAMPLE BORING**

Client: XYZ Chemical Plant, An ABC Company

Location: Smith Street Site Syracuse, NY

DRAFT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
	685								
0		1	0-2	2.0	1 1 2 5	3	1.1		Asphalt surface. Black-gray coarse GRAVEL, some fine Sand, moist. Dark brown to brown fine SAND and Coal SLAG, some medium to coarse Sand, moist.
	680	2	2-4	1.2	1 2 3 5	5	0.0		Light gray to white ASH, little rust colored mottles, moist to wet. Dark gray fine SAND and SILT, trace Clay, slightly plastic, some rust colored layers, wet.
5		3	4-6	1.1	1 2 1 5	3	0.0		Dark gray SILT and CLAY, little fine Gravel, little coarse Sand, medium plasticity, soft, wet. Gravel content increasing to some below 4.7' bgs.
	675	4	6-8	1.3	7 8 1 8	9	0.0		Red to yellow-brown fine to medium GRAVEL and coarse SAND, little Silt, trace Clay, wet.
		5	8-10	0.3	1 2 5 4	7	0.0		Brown fine to coarse SAND, some fine Gravel, little Silt, moist.
10		6	10-12	0.0	6 18 50/0.3	NA	NA		No Recovery.
	670	7	12-14	1.4	6 5 4 6	9	3.5		Red to yellow-brown fine to medium GRAVEL and coarse SAND, little Silt, saturated.
15		8	14-16	1.5	2 9 1 2	10	4.5		Color change to brown below 14' bgs.



Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

ARCADIS
Infrastructure, environment, facilities

Client: XYZ Chemical Plant,
An ABC Company

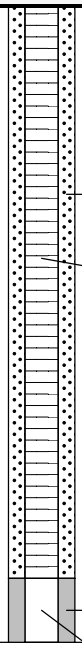
Site Location:
Smith Street Site
Syracuse, NY

Well/Boring ID: **EXAMPLE BORING**

Borehole Depth: 26' bgs

DRAFT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	2.0	3 2 1 1	3	0.0		Brown fine to medium GRAVEL and coarse SAND, little Silt, saturated.	
	665	10	18-20	2.0	1 1 2 2	3	0.0			
20		11	20-22	2.0	5 4 1 2	5	0.0			
	660	12	22-24	1.6	4 13 12 9	15	87			
25		13	24-26	1.7	3 12 9 15	21	112			
	655									
30										
	650									
35										



ARCADIS
Infrastructure, environment, facilities

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

ATTACHMENT D

Calibration Log

PID Calibration Log

ARCADIS Design & Consultancy for natural and built assets

Zero Gas Source: ____________________ Instrument Type: ____________________ PAGE ____ of ____

Lot Number/Expiration Date: ____________________ Serial Number: ____________________

Calibration Gas Source: ____________________ Instrument Type: ____________________

Lot Number/Expiration Date: ____________________ Serial Number: ____________________

Concentration: ____________________ ____________________

Instrument Number	Date	Time	Zero Cal. OK (Y/N)	Calibration Gas Reading	Comments	Calibration w/in 2% (Y/N)?	Alarms Set (Yes/No)?	User Initials

Arcadis of New York, Inc.

One Lincoln Center

110 West Fayette Street

Suite 300

Syracuse, New York 13202

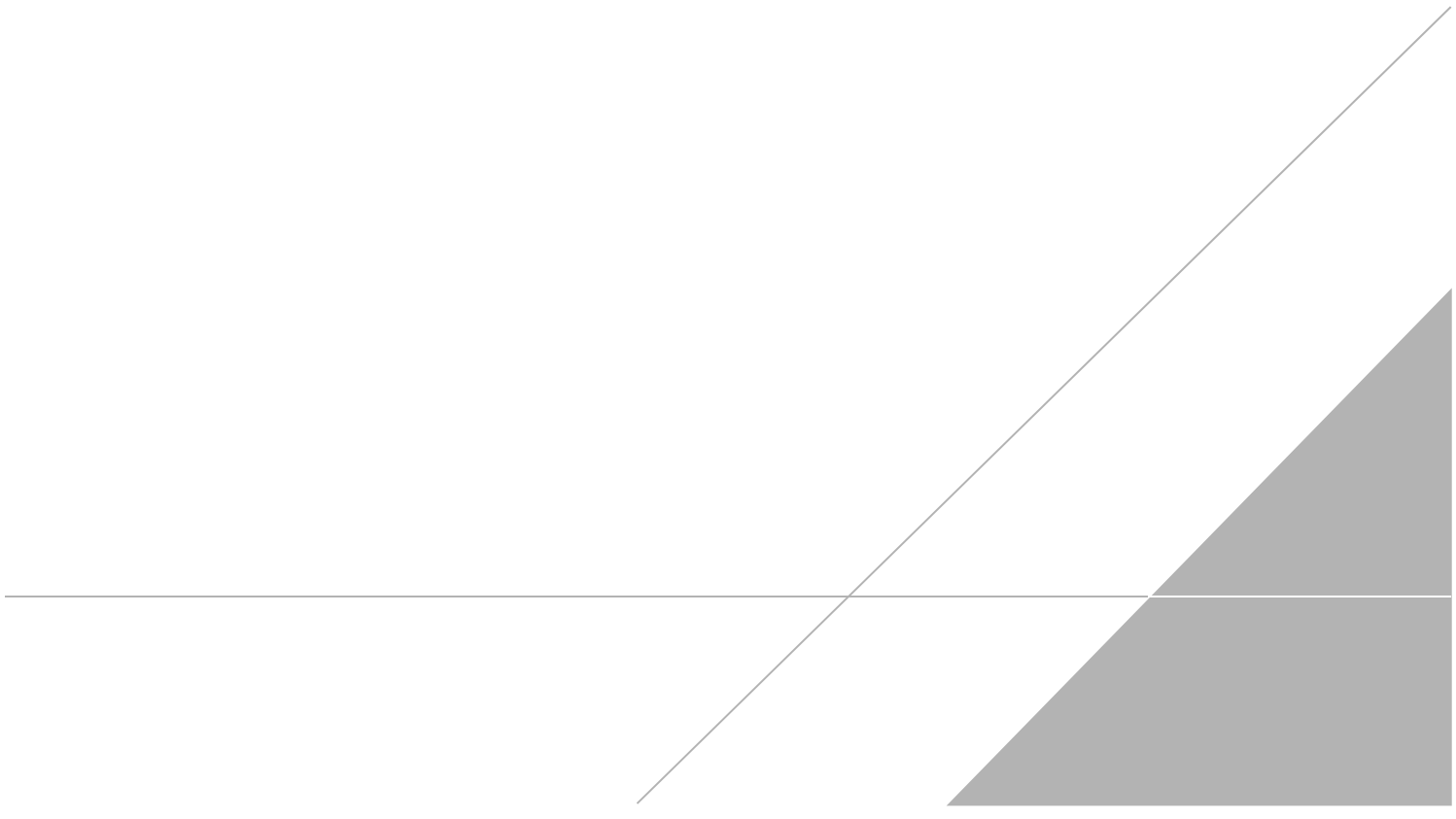
Tel 315 446 9120

Fax 315 449 0017

www.arcadis.com

Appendix F

Generic Quality Assurance Project Plan



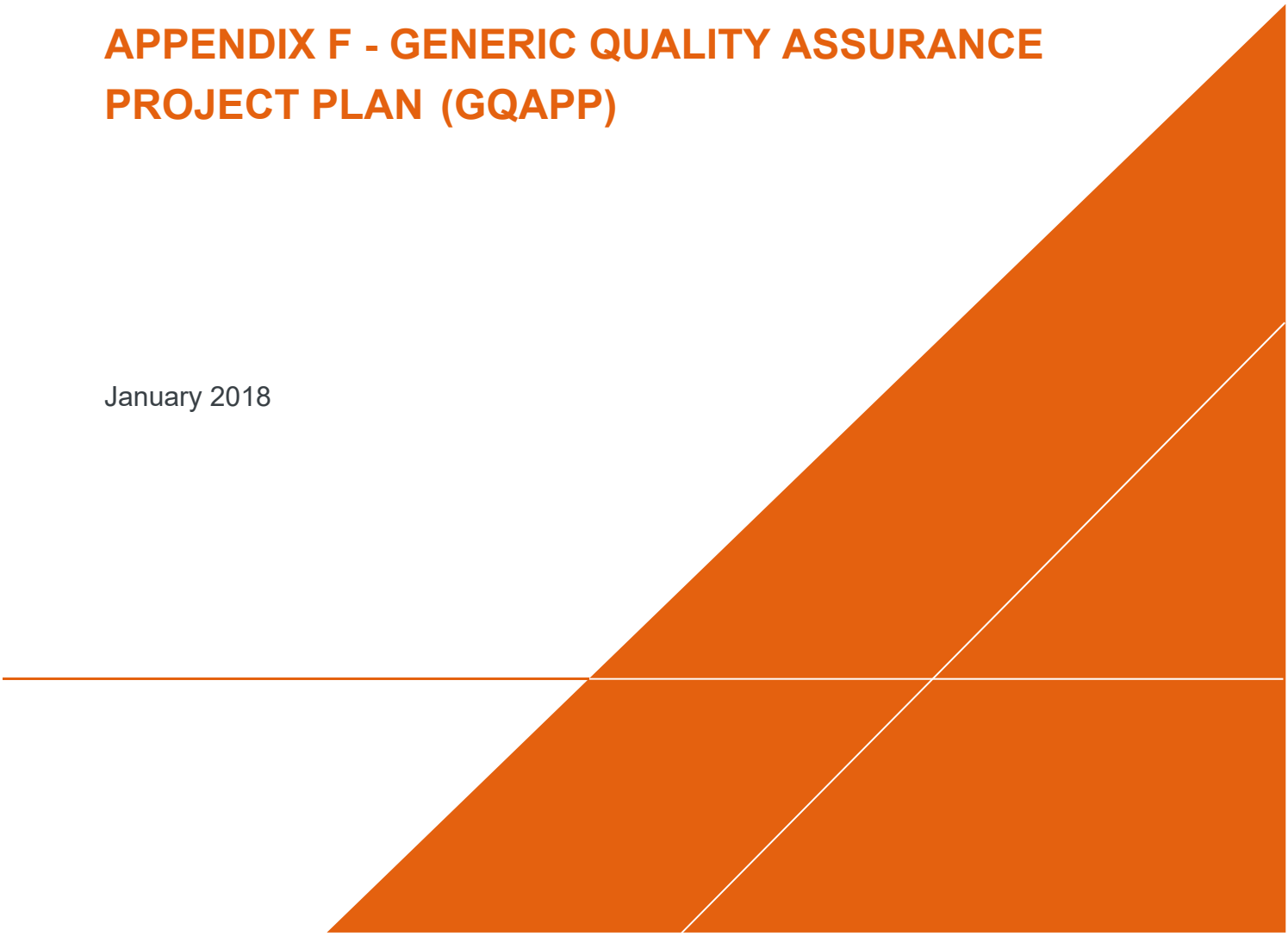
ARCADIS Design & Consultancy for natural and built assets

RG&E

SITE MANAGEMENT PLAN

APPENDIX F - GENERIC QUALITY ASSURANCE PROJECT PLAN (GQAPP)

January 2018



SITE MANAGEMENT PLAN APPENDIX F - GQAPP

Prepared for:

RG&E

Prepared by:

Arcadis of New York, Inc.

295 Woodcliff Drive

Third Floor

Suite 301

Fairport

New York 14450

Tel 585 385 0090

Fax 585 385 4198

Our Ref.:

B0013138.0004

Date:

January 2018

CONTENTS

TABLES

ATTACHMENT

ACRONYMS AND ABBREVIATIONS

Arcadis	ARCADIS of New York, Inc.
ASP	Analytical Services Protocol
CLP	Contract Laboratory Program
DQO	data quality objective
EDD	electronic data deliverable
GFSP	Generic Field Sampling Plan
GHASP	Generic Health and Safety Plan
GQAPP	Generic Quality Assurance Project Plan
MGP	manufactured gas plant
MS/MSD	matrix spike/matrix spike duplicate
NYSDEC	New York State Department of Environmental Conservation
ORP	oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
QA/QC	quality assurance/quality control
QAM	Quality Assurance Manager
RPD	relative percent difference
SDG	sample delivery ground
SMP	Site Management Plan
SUNY	State University of New York
SVOC	semivolatile organic compound
TOC	total organic carbon
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

PREFACE

This Generic Quality Assurance Project Plan (GQAPP) has been prepared to support the Site Management Plan (SMP) for RG&E's former manufactured gas plan (MGP) site located at 4 and 6 Park Street in the Village of Geneseo, New York (Park Street Former MGP). This GQAPP presents a general guideline for Remedial Contractors preparing the task-specific Quality Assurance Project Plan (QAPP). Inclusion of this GQAPP is for illustrative purposes only; this GQAPP may not be used as a substitute for a Remedial Contractor-prepared QAPP.

Any field sampling activities associated with the SMP will be performed in compliance with a Contractor-prepared task-specific QAPP. The Remedial Contractor shall be responsible for preparing a task-specific QAPP in compliance with applicable Federal, State, and local rules and regulations. All laboratory analytical work must be performed in accordance with applicable federal, state, and local rules and regulations. Any use or adaptation of any portion of this GQAPP by a Remedial Contractor will be at the sole risk of the Remedial Contractor.

This GQAPP was prepared in a manner consistent with the following reference and guidance documents:

- United States Environmental Protection Agency's (USEPA's) *Test Methods for Evaluating Solid Waste, SW-846* (USEPA, 1996)
- The USEPA's guidance document entitled *EPA Requirements for Quality Assurance Project Plans for Environmental Operations, EPA-QA/R-5* (USEPA, 2001), which replaces QAMS-005/80 *Interim Guidance and Specifications for Preparing Quality Assurance Project Plans* (USEPA, 1980)
- the National Enforcement Investigations Center *Policies and Procedures Manual* (USEPA, 1991)

1. PROJECT ORGANIZATION AND RESPONSIBILITIES

1.1 Project Organization

Operation, monitoring and maintenance (OM&M) and/or intrusive work conducted within potentially impacted areas of the Park Street Former MGP site will require integration of personnel from the organizations identified below, collectively referred to as the project team. A description of the responsibilities of each member of the project team is presented in Section 1.2.

Title	Company/Organization	Name	Phone Number
RGE Project Manager	RGE	Jeremy Wolf	585.724.8548
Property Owner	State University of New York at Geneseo	Chuck Reyes	585.245.5512
NYSDEC Project Manager	NYSDEC	Mr. Amen Omorogbe, P.E.	518.402.9662

1.1.1 Analytical Laboratory Services and Subcontractors

The analytical services and contractor performing intrusive activities will be determined prior to initiation of field work. Laboratory and subcontractor management personnel are listed below.

Title	Company/Organization	Name	Phone Number
Laboratory Project Manager	To be determined		
Contractors/Consultants	To be determined		

1.1.2 Quality Assurance Staff

Individuals conducting intrusive work within potentially MGP-impacted areas identified in the SMP will identify quality assurance (QA) personnel. In addition to the contractor's personnel, the following personnel have been assigned to this project component:

Title	Company/Organization	Name	Phone Number
RGE QA Manager	RGE	Jeremy Wolf	585.724.8548
NYSDEC QC Manager	NYSDEC	Mr. Amen Omorogbe, P.E.	518.402.9662

1.2 Team Member Responsibilities

This section of the GQAPP discusses the responsibilities and duties of the project team members.

1.2.1 RGE

RGE Project Manager

1. Overall understanding of the nature and extent of MGP-related impacts remaining at the site.
2. Understands proposed intrusive activities within potentially MGP impacted areas.
3. Understand the SMP, GQAPP, and Generic Field Sampling Plan (GFSP) requirements.
4. Ensure SMP requirements are implemented.
5. Review results, reports, and all documents prepared by contractors conducting work within potentially impacted areas.
6. Confirm that corrective actions are taken for deficiencies cited during audits of the field activities.

1.2.2 Property Owner

State University of New York (SUNY) Geneseo

1. Ensure that all the requirements of the SMP, GQAPP, and GFSP are followed for all proposed intrusive work conducted within potentially MGP-impacted area.
2. Communicate/notify the project team regarding proposed intrusive work to be conducted within potentially MGP-impacted areas.

1.2.3 NYSDEC

NYSDEC Project Manager

1. Ensure that all the requirements of the SMP, GQAPP, and GFSP are followed for all proposed intrusive work conducted within potentially MGP-impacted areas.
2. Review results, reports, and all documents prepared by contractors conducting work within potentially impacted areas.
3. Overall understanding of the nature and extent of MGP-related impacts remaining at the site.
4. Provide review and approval of contractor’s work plans for work proposed within potentially MGP-impacted areas.

1.2.4 Contractors/Consultants

Contractor Project Manager/Field Personnel

1. Management and coordination of all aspects of the project with an emphasis on adhering to the requirements of the SMP, GQAPP, and GFSP.
2. Oversight of required media sampling.
3. Oversight of field analysis and collection of QA samples.
4. Reduction of field data calibration and maintenance.
5. Review of the field instrumentation, maintenance, and calibration to maintain quality data.
6. Preparation of draft reports and other key documents.
7. Maintenance of field files of notebooks and logs and calculations.
8. Coordination of field and laboratory schedules.
9. Perform field procedures associated with the tasks and subtasks presented in Section 3.
10. Perform field analyses and collect QA samples maintain sample custody.
11. Prepare field records and logs.
12. Calibrate, operate, and maintain field equipment.
13. Reduce field data.

Quality Assurance Manager

1. Review laboratory data packages.
2. Oversee and interface with the analytical laboratories.
3. Coordinate field quality assurance/quality control (QA/QC) activities with task managers, including audits of field activities, concentrating on field analytical measurements and practices to meet data quality objectives (DQOs).
4. Review field reports.
5. Review audit reports.
6. Prepare a QA/QC report that includes an evaluation of field and laboratory data and data validation reports.

1.2.5 Laboratory Subcontractor (to be determined)

General responsibilities and duties include:

1. Perform sample analyses.
2. Supply sample containers and shipping cartons.
3. Maintain laboratory custody of samples.

4. Strictly adhere to laboratory protocols.

Laboratory Project Manager

1. Serve as primary communication link between ARCADIS and laboratory staff.
2. Monitor workloads and confirm availability of resources.
3. Oversee preparation of analytical reports.
4. Supervise in-house chain of custody.

Quality Assurance Officer

1. Supervise technical staff in QA/QC procedures.
2. Conduct audits of all laboratory activities.

1.2.6 Data Validator

1. Provide independent validation of analytical data.

2. PROJECT BACKGROUND

The following summarizes background information for the project site. Additional information can be found in the SMP.

2.1 Site Location and Description

The Park Street former MGP site is located at 6 Park Street in the Village of Geneseo, Livingston County, New York. The Park Street site covers approximately 3/4 of an acre and is located on the eastern side of the SUNY Geneseo campus. The eastern portion of the site is paved, and the western portion is covered by buildings and landscaping.

The site, which is owned by SUNY, is bound on the north by commercial buildings and School Street; on the west by a SUNY academic building complex (the Brodie Fine Arts building), by Park Street and a city park on the south; and on the east by a SUNY parking lot and commercial buildings along the west side of Main Street. The Park Street site straddles the boundary between the village commercial district and the SUNY campus.

The Brodie Fine Arts building is a square building complex that includes an inner courtyard and a high-rise tower at the east side of the complex. Based on the overlay of historic with modern structures, the east side of the former gas production building was likely located under the parking lot and driveway, and the west side of the gas house and the gas holder was under the east end of the Brodie building.

2.2 Objectives

This GQAPP was prepared to support the SMP. This document presents QA/QC requirements for OM&M and/or intrusive activities to be conducted associated with the NYSDEC-selected remedy for the Park Street Former MGP site. In addition, as stated above, this GQAPP can also be used as a generic guide for Contractors performing activities within potentially impacted areas of the site where the SMP requires soil or water sampling; however, the Contractor should verify the required analyses and data quality objectives with the NYSDEC.

A SMP has been prepared as required in the Record of Decision (ROD) for the site (NYSDEC, 2008) and in accordance with the *Technical Guidance for Site Investigation and Remediation*, DER-10 (NYSDEC, 2010) (DER-10). A SMP is required for all sites that the NYSDEC has oversight responsibility, including the New York State Inactive Hazardous Waste Disposal Site Remedial Program, as defined by Environmental Conservation Law, Article 27, Title 13. NYSEG's Madison Avenue site falls under this jurisdiction.

3. QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

DQOs are qualitative and quantitative statements that specify the quality of data required to support decisions made during site-related activities and are based on end uses of the data to be collected. Preliminary DQOs were identified to confirm that data generated during field investigations will be of adequate quality and sufficient quantity to form a sound basis for decision making relative to the above objectives. DQOs have been specified for each data collection activity or investigation. The DQOs presented herein address investigation efforts only and do not cover health and safety issues, which are addressed in detail in a task-specific Health and Safety Plan (HASP).

A DQO summary for the sampling investigation efforts is presented below. The summary consists of stated DQOs relative to data uses, data types, data quantity, sampling and analytical methods, and data measurement performance criteria.

Three data categories have been defined to address various analytical data uses and the associated QA/QC effort and methods required to achieve the desired levels of quality. These categories are:

Screening Data: Screening data affords a quick assessment of site characteristics or conditions. This objective for data quality is applicable to data collection activities that involve rapid, non-rigorous methods of analysis and QA. This objective is generally applied to physical and/or chemical properties of samples, degree of contamination relative to concentration differences, and preliminary health and safety assessment.

Screening Data with Definitive Confirmation: Screening data allows rapid identification and quantitation, although the quantitation can be relatively imprecise. This objective for data quality is available for data collection activities that require qualitative and/or quantitative verification of a select portion of sample findings (10% or more). This objective can also be used to verify less rigorous laboratory-based methods.

Definitive Data: Definitive data are generated using analytical methods, such as approved USEPA reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce raw data (e.g., chromatograms, spectra, digital values) in the form of paper printouts or computer-generated electronic files.

For this project, three levels of data reporting have been defined. They are as follows:

Level 1 – Minimal Reporting: Minimal or “results only” reporting is used for analyses that, either due to their nature (i.e., field monitoring) or the intended data use (i.e., preliminary screening), do not generate or require extensive supporting documentation.

Level 2 – Modified Reporting: Modified reporting is used for analyses that are performed following standard USEPA-approved methods and QA/QC protocols and that, based on the intended data use, require some supporting documentation but not, however, full “Contract Laboratory Program-type” (CLP-type) reporting.

Level 3 – Full Reporting: Full “CLP-type” reporting is used for those analyses that, based on intended data use, require full documentation. This reporting level would include Analytical Services Protocol (ASP) Superfund and Category B reporting.

The analytical methods to be used during the OM&M activities will include Level 1, Level 2, and Level 3, depending on the sampling conducted; the level should be specified in the task-specific work plan.

The analytical methods to be used during intrusive soil and/or groundwater sampling activities will be USEPA SW-846 methods with NYSDEC ASP Revision 2000, QA/QC requirements, and Category B reporting deliverables.

3.1 Data Quality Objectives for Intrusive Soil Sampling and Staged Soil Sampling

When required, it is anticipated that excavation will be advanced to varying depths. Subsurface soil samples will be visually characterized and may not require laboratory analyses. However, in the event laboratory analyses are required, soil samples may be collected from the excavation or staged sources. In this instance, the required analyses should be confirmed with NYSEG and the NYSDEC; however, for the purposes of this GQAPP, it is anticipated that samples may be collected for analysis of:

- Volatile organic compounds (VOCs) USEPA SW-846 Method 8260
- Semivolatile organic compounds (SVOCs) USEPA SW-846 Method 8270
- Inorganics USEPA SW-846 Method 6010

The number of required QA/QC samples is summarized in **Table 2**. **Table 1** presents the parameters to be analyzed under each of the methods described above with the laboratory quantitation limits. Additional analyses may be required by RGE or the NYSDEC.

3.2 Data Quality Objectives for Groundwater

The number of groundwater QA/QC samples is summarized in **Table 2**. **Table 1** presents the parameters to be analyzed under each of the methods described above with the laboratory quantitation limits. For the purposes of this GQAPP, it is assumed that samples will be analyzed for:

- Benzene, toluene, ethylbenzene, xylene USEPA SW-846 Method 8260
- Polycyclic Aromatic Hydrocarbon USEPA SW-846 Method 8270

As described in the SMP, both hydrogeologic and water quality data are required to meet the objective of this task. Hydrogeologic data may include water-level information and hydraulic conductivity values that will be used to calculate other hydrogeologic parameters. Groundwater quality data may include field parameters, including pH, oxidation-reduction potential (ORP), turbidity, temperature, conductivity, and dissolved oxygen, as well as the laboratory parameters described below.

Groundwater level measurement procedures, field parameter measurement procedures, and groundwater sampling methods are provided in the GFSP.

3.3 Data Quality Objectives for Waste Characterization

In the event that activities create either liquid or soil waste requiring off-site disposal, RGE will be consulted to determine the required analyses. However, for the purposes of this GQAPP, it is assumed that samples may be collected and analyzed for:

- VOCs USEPA SW-846 Method 8260
- SVOCs USEPA SW-846 Method 8270
- Inorganics USEPA SW-846 Method 6010
- Pesticides/Herbicides USEPA SW-846 Method 8081
- Polychlorinated Biphenyl USEPA SW-846 8082
- Ignitability, Reactivity, Corrosivity

4. SPECIAL TRAINING REQUIREMENTS/CERTIFICATION

Compliant with the Occupational Safety and Health Administration's (OSHA's) final rule, *Hazardous Waste Operations and Emergency Response*, 29 Code of Federal Regulations Part 1910.120(e), all personnel performing work in potentially MGP-impacted areas will have completed the requirements for OSHA 40-hour Hazardous Waste Operations and Emergency Response training. Persons in field supervisory positions will have also completed the additional OSHA 8-hour Supervisory Training.

5. DOCUMENTATION AND RECORDS

5.1 General

Samples of the various media may be collected, as described in the SMP or other task-specific work plan. Detailed descriptions of the documentation and reporting requirements are presented below.

5.2 Field Documentation

Field personnel will provide comprehensive documentation covering all aspects of field sampling, field analysis, and sample chain of custody. This documentation constitutes a record that allows reconstruction of all field events to aid in data review and interpretation process. All documents, records, and information relating to performance of field work will be retained in the project file.

The various forms of documentation to be maintained throughout the action include:

- *Daily Production Documentation* – A field notebook consisting of a waterproof, bound notebook that will contain a record of all activities performed at the site.
- *Sampling Information* – Detailed notes will be made as to the exact site of sampling, physical observations, and weather conditions (as appropriate).
- *Sample Chain of Custody* – Chain of custody forms will provide the record of responsibility for sample collection, transport, and submittal to the laboratory. Chain of custody forms will be filled out at each sampling site, at a group of sampling sites, or at the end of each day of sampling by ARCADIS field personnel designated to be responsible for sample custody. In the event that samples are relinquished by the designated sampling person to other sampling or field personnel, the chain of custody form will be signed and dated by the appropriate personnel to document the sample transfer. The original chain of custody form will accompany the samples to the laboratory, and copies will be forwarded to the project files. A sample chain of custody form is included in **Attachment F-1**.

  Persons will have custody of samples when the samples are in their physical possession, in their view after being in their possession, or in their physical possession and secured so they cannot be tampered with. In addition, when samples are secured in a restricted area accessible only to authorized personnel, they will be deemed to be in the custody of such authorized personnel.
- *Field Equipment, Calibration, and Maintenance Logs* – To document calibration and maintenance of field instrumentation, calibration and maintenance logs will be maintained for each piece of field equipment that is not factory calibrated.

5.3 Laboratory Documentation

5.3.1 Laboratory Project Files

The laboratory will establish a file for all pertinent data. The file will include all correspondence, faxed information, phone logs, and chain of custody forms. The laboratory will retain all project files and data packages for a period of 5 years.

5.3.2 Laboratory Logbooks

Workbooks, bench sheets, instrument logbooks, and instrument printouts will be used to trace the history of samples through the analytical process and document and relate important aspects of the work, including the associated quality controls. As such, all logbooks, bench sheets, instrument logs, and instrument printouts will be part of the permanent record of the laboratory.

Each page or entry will be dated and initialed by the analyst at the time of entry. Errors in entry will be crossed out in indelible ink with a single stroke, corrected without the use of whiteout or by obliterating or writing directly over the erroneous entry, and initialed and dated by the individual making the correction. Pages of logbooks that are not used will be completed by lining out unused portions.

Information regarding the sample, analytical procedures performed, and the results of the testing will be recorded on laboratory forms or personal notebook pages by the analyst. These notes will be dated and will also identify the analyst, the instrument used, and the instrument conditions.

Laboratory notebooks will be periodically reviewed by the laboratory group leaders for accuracy, completeness, and compliance to this GQAPP. All entries and calculations will be verified by the laboratory group leader. If all entries on the pages are correct, then the laboratory group leader will initial and date the pages. Corrective action will be taken for incorrect entries before the laboratory group leader signs.

5.3.3 Computer Tape and Hard Copy Storage

All electronic files will be maintained on CD-ROM for 5 years; hard copy data packages will be maintained in files for 5 years.

5.4 Data Reporting Requirements

5.4.1 Field Data Reporting

Information collected in the field through visual observation, manual measurement, and/or field instrumentation will be recorded in field notebooks or data sheets and/or on forms. Such data will be reviewed by the appropriate Task Manager for adherence to the work plan and for consistency. Concerns identified as a result of this review will be discussed with the field personnel, corrected if possible, and, as necessary, incorporated into the data evaluation process.

Where appropriate, field data forms and calculations will be processed and included in appendices to a Site Report (when generated). Original field logs, documents, and data reductions will be kept in the project file.

5.4.2 Laboratory Data Reporting

The laboratory is responsible for preparing ASP Category B data packages for all VOC and SVOC data, reduced data packages, and case narratives for all other analyses.

All data reports for all parameters will include, at a minimum, the following items:

Narrative – Summary of activities that took place during the course of sample analysis, including the following information:

- laboratory name and address
- date of sample receipt
- cross reference of laboratory identification number to contractor sample identification
- analytical methods used
- deviations from specified protocol
- corrective actions taken

Included with the narrative will be any sample handling documents, including field and internal chain of custody forms, air bills, and shipping tags.

Analytical Results – Reported according to analysis type, including the following information, as acceptable:

- sample ID
- laboratory ID
- date of collection
- date of receipt
- date of extraction
- date of analysis
- detection limits

Sample results on report forms will be collected for dilutions. Soil samples will be reported on a dry weight basis. Unless otherwise specified, results will be reported uncorrected for blank contamination.

Data for volatile and semi-volatile analyses will be expanded to include all supporting documentation necessary to provide a Category B package. This additional documentation will include, but is not limited to, all raw data required to recalculate any result, including printouts, chromatograms, and quantitation reports. The report also will include standards used in calibration and calculation of analytical results; sample extraction, digestion, and other preparation logs; standard preparation logs; instrument run logs; and moisture content calculations.

5.5 Project File

Project documentation will be placed in project files for document management. Project files typically consist of the following components:

1. Agreements/Proposals (filed chronologically)
2. Change Orders/Purchase Orders (filed chronologically)
3. Invoices (filed chronologically)

4. Project Management (filed by topic)
5. Correspondence (filed chronologically)
6. Notes and Data (filed by topic)
7. Public Relations Information (filed by topic)
8. Regulatory Documents (filed chronologically)
9. Marketing Documents (filed chronologically)
10. Final Reports/Presentations (filed chronologically)
11. Draft Reports/Presentations (filed chronologically)
12. Documents Prepared by Others (filed chronologically)

Final reports (including QA Reports) are filed in a designated folder within the project file. Analytical laboratory documentation (when received) and field data will also be filed in a designated folder within the project file. Filed materials may be removed and signed out by authorized personnel on a temporary basis only.

6. SAMPLING PROCESS DESIGN

Information regarding the sampling design and rationale and associated sampling locations can be found in the SMP or other task-specific work plans.

7. SAMPLING METHOD REQUIREMENTS

Soil and/or groundwater samples will be collected, as necessary, as described in the SMP or task-specific work plan. Sampling procedures are included in the GFSP. The GFSP also contains the procedures that will be followed to install monitoring wells; measure water levels; perform field measurements; and handle, package, and ship collected samples.

8. SAMPLE HANDLING AND CUSTODY REQUIREMENTS

8.1 Sample Containers and Preservation

Appropriate sample containers, preservation methods, and laboratory holding times for the samples are shown in **Table 3**.

The analytical laboratory will supply appropriate sample containers and preservatives, as necessary. Bottles will be purchased pre-cleaned to USEPA Office of Solid Waste and Emergency Response Directive 9240.05A requirements. Field personnel will be responsible for properly labeling containers and preserving samples (as appropriate).

8.2 Packing, Handling, and Shipping Requirements

Sample packaging and shipment procedures are designed to confirm that samples will arrive at the laboratory, with the chain of custody intact.

Samples will be packaged for shipment as outlined below:

- Confirm that all sample containers have the sample labels securely affixed to the container with clear packing tape.
- Check the caps on the sample containers to confirm that they are properly sealed.
- Wrap the sample container cap with clear packing tape to prevent it from becoming loose.
- Complete the chain of custody form with the required sampling information and confirm that the recorded information matches the sample labels. (Note: If the designated sampler relinquishes the samples to other sampling or field personnel for packing or other purposes, the sampler will complete the chain of custody prior to this transfer. The appropriate personnel will sign and date the chain of custody form to document the sample custody transfer.)
- Using duct tape, secure the outside drain plug at the bottom of the cooler.
- Wrap sample containers in bubble wrap or other cushioning material.
- Place 1 to 2 inches of cushioning material at the bottom of the cooler.
- Place the sealed sample containers into the cooler.
- Place ice in plastic bags and seal. Place loosely in the cooler.
- Fill the remaining space in the cooler with cushioning material.
- Place chain of custody forms in a plastic bag and seal. Tape the forms to the inside of the cooler lid.
- Close the lid of the cooler, lock, and secure with duct tape.
- Wrap strapping tape around both ends of the cooler at least twice.

- Mark the cooler on the outside with the following information: shipping address, return address, “Fragile” labels, and arrows indicating “this side up.” Cover the labels with clear plastic tape. Place a signed custody seal over the cooler lid.

All samples will be packaged by field personnel and transported as low-concentration environmental samples. The samples will be hand-delivered or delivered by an express carrier within 48 hours of the time of collection. All shipments will be accompanied by the chain of custody form identifying the contents. The original form will accompany the shipment; copies will be retained by the sampler for the sampling office records. If the samples are sent by common carrier, a bill of lading should be used. Receipts or bills of lading will be retained as part of the permanent project documentation. Commercial carriers are not required to sign off on the chain of custody form, as long as the forms are sealed inside the sample cooler and the custody seals remain intact.

Sample custody seals and packing materials for filled sample containers will be provided by the analytical laboratory. The filled, labeled, and sealed containers will be placed in a cooler on ice and carefully packed to eliminate the possibility of container breakage. Trip blank(s) of analyte-free water will be provided by the laboratory and included in each cooler containing aqueous samples to be analyzed for VOCs.

Procedures for packing, handling, and shipping environmental samples are included in the GFSP.

8.3 Field Custody Procedures

The objective of field sample custody is to confirm that samples are not tampered with from the time of sample collection through the time of transport to the analytical laboratory. Persons will have “custody of samples” when the samples are in their physical possession, in their view after being in their possession, or in physical possession and secured so they cannot be tampered with. In addition, when samples are secured in a restricted area accessible only to authorized personnel, they will be deemed to be in the custody of such authorized personnel.

Field custody documentation consists of both field logbooks and field chain of custody forms.

8.3.1 Field Logbooks

Field logbooks will provide the means of recording data collecting activities performed. As such, entries will be described in as much detail as possible so that persons going to the site could reconstruct a particular situation without reliance on memory.

Field logbooks will be bound field survey books or notebooks. Logbooks will be assigned to field personnel, but will be stored in a secure location when not in use. Each logbook will be identified by the project-specific document number. The title page of each logbook will contain the following:

- person to whom the logbook is assigned
- logbook number
- project name
- project start date
- end date

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, level of personal protection being used, and the signature of the person making the entry will be entered. The names of visitors to the site, field sampling or investigation team personnel, and the purpose of their visit will also be recorded in the field logbook.

Measurements made and samples collected will be recorded. All entries will be made in ink, and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark. Whenever a sample is collected or a measurement is made, a detailed description of the location of the station shall be recorded. The number of the photographs taken of the station, if any, will also be noted. All equipment used to make measurements will be identified, as well as with the date of calibration.

Samples will be collected following sampling procedures documented in the GFSP. The equipment used to collect samples will be noted, as well as with the time of sampling, sample description, depth at which the sample was collected, volume, and number of containers. Sample identification numbers will be assigned prior to sample collection. Field duplicate samples, which will receive an entirely separate sample identification number, will be noted under sample description.

8.3.2 Sample Labeling

Preprinted sample labels will be affixed to sample bottles prior to delivery at the sampling site. The following information is required in each sample label.

- project
- date collected
- time collected
- location
- sampler
- analysis to be performed
- preservative
- sample number

8.3.3 Field Chain of Custody Forms

Completed chain of custody forms will be required for all samples to be analyzed. Chain of custody forms will be initiated by the sampling crew in the field. The chain of custody forms will contain the sample's unique identification number, sample date and time, sample description, sample type, preservation (if any), and analyses required. The original chain of custody form will accompany the samples to the laboratory. Copies of the chain of custody will be made prior to shipment (or multiple copy forms used) for field documentation. The chain of custody forms will remain with the samples at all times. The samples and signed chain of custody forms will remain in the possession of the sampling crew until the samples are delivered to the express carrier (e.g., FedEx) or hand delivered to a mobile or permanent laboratory, or placed in secure storage.

Sample labels will be completed for each sample using waterproof ink, unless prohibited by weather conditions. The labels will include sample information, such as sample number and location, type of sample, date and time of sampling, sampler's name or initials, preservation, and analyses to be performed. The completed sample labels will be affixed to each sample bottle and covered with clear tape.

Whenever samples are collocated with a source or government agency, a separate Sample Receipt will be prepared for those samples and marked to indicate with whom the samples are being collocated. The person relinquishing the samples to the facility or agency should request the representative's signature, acknowledging sample receipt. If the representative is unavailable or refuses, this is noted in the "Received By" space.

8.4 Management of Investigation-Derived Materials and Wastes

Disposable equipment, debris, and decontamination rinsate (e.g., tap and distilled water containing small amounts of solvent) will be containerized during sampling events and labeled for appropriate disposal.

8.5 Laboratory Procedures

8.5.1 General

Upon sample receipt, laboratory personnel will be responsible for sample custody. A field chain of custody form will accompany all samples requiring laboratory analysis. Samples will be kept secured in the laboratory until all stages of analysis are complete. All laboratory personnel having samples in their custody will be responsible for maintaining sample integrity.

8.5.2 Sample Receipt and Storage

Upon sample receipt, the laboratory sample custodian will verify the package seal, open the package, verify sample integrity, and compare the contents against the field chain of custody. If a sample container is broken, the sample is in an inappropriate container, has not been preserved by appropriate means, or if there is a discrepancy between the chain of custody and the sample shipment, that contractor will be notified. The laboratory sample custodian will then log the samples in, assign a unique laboratory identification number to each, and label the sample bottle with the laboratory identification number. The project name, field sample code, date sampled, date received, analysis required, storage location and date, and action for final disposition will be recorded in the laboratory information management system.

8.5.3 Sample Chain of Custody and Documentation

Laboratory chain of custody and documentation will follow procedures consistent with Exhibit F of the New York State Department of Environmental Conservation (NYSDEC) ASP 2000.

8.5.4 Sample Analysis

Analysis of an acceptable sample will be initiated by worksheets that contain all pertinent information for analysis. The analyst will sign and date the laboratory chain of custody form when removing the samples from storage.

Samples will be organized into sample delivery groups (SDGs) by the laboratory. A SDG may contain up to 20 field samples (field duplicates, trip blanks, and rinse blanks are considered field samples for the purposes of SDG assignment). All field samples assigned to a single SDG shall be received by the laboratory over a maximum of 7 calendar days, and must be processed through the laboratory (preparation, analysis, and reporting) as a group. Every SDG must include a minimum of one site-specific matrix/matrix spike duplicate (MS/MSD) pair, which shall be received by the laboratory at the start of the SDG assignment.

Each SDG will be self-contained for all of the required QC samples. All parameters within an SDG will be extracted and analyzed together in the laboratory. At no time will the laboratory be allowed to run any sample (including QC samples) at an earlier or later time than the rest of the SDG. These rules for analysis will confirm that the QC samples for an SDG are applicable to the field samples of the same SDG and that the best possible comparisons can be made.

8.5.5 Sample Storage Following Analysis

The remaining samples will be maintained by the laboratory for 1 month after the final report is delivered to the contractor. After this period, samples will be disposed of in accordance with applicable rules and regulations.

9. ANALYTICAL PROCEDURES

9.1 Field Analytical Procedures

Field analytical procedures may include measurement of pH, ORP, turbidity, temperature, conductivity, dissolved oxygen, and groundwater levels. Specific field measurement protocols are provided in the GFSP.

9.2 Laboratory Analytical Procedures

Laboratory analytical requirements presented in the subsections below include a general summary of requirements, specifics related to each sample medium that may be analyzed, and details of the methods to be used for this project. SW-846 methods with NYSDEC, ASP, 2000 Revision, QA/QC and reporting deliverables requirements will be used for all analytes.

9.2.1 General

The attached tables summarize general analytical requirements:

Table	Title
Table 1	Parameters, Methods, and Quantitation Limits
Table 2	Environmental and Quality Control Sample Analyses
Table 3	Sample Containers, Preservation Methods, and Holding Times Requirements

9.2.2 Sample Metrics

9.2.2.1 Soil

Analyses in this category will relate to soil samples. Analyses will be performed following methods listed in Table 2. Results will be reported as dry weight, in units presented in Table 1. Moisture content will be reported separately.

9.2.3 Analytical Requirements

Primary sources to describe analytical methods to be used during investigation are provided in USEPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition and USEPA Methods for Chemical Analysis of Water and Waste with NYSDEC ASP 2000 Revision, QA/QC and reporting deliverables requirements. Detailed information regarding QC procedures, including MS/MSDs, MS blanks, and surrogate recoveries is provided in NYSDEC, ASP 2000 Revision, Exhibit E.

10. QUALITY CONTROL REQUIREMENTS

10.1 Quality Assurance Indicators

The overall QA objective for this GQAPP is to develop and implement procedures for sampling, chain of custody, laboratory analysis, instrument calibration, data reduction and reporting, internal QC, audits, preventive maintenance, and corrective action such that valid data will be generated. These procedures are presented or referenced in the following sections of the GQAPP. Specific QC checks are discussed in Section 10.3.

QA indicators are generally defined in terms of five parameters:

1. representativeness
2. comparability
3. completeness
4. precision
5. accuracy

Each parameter is defined below. Specific objectives for the site actions are set forth in other sections of this GQAPP, as referenced below.

10.1.1 Representativeness

Representativeness is the degree to which sampling data accurately and precisely represent site conditions, and is dependent on sampling and analytical variability. The investigation activities have been designed to assess the presence of constituents at the time of sampling. The SMP or task-specific work plan presents the rationale for sample quantities and location. The GFSP and this GQAPP present field sampling methodologies and laboratory analytical methodologies. The use of the prescribed field and laboratory analytical methods with associated holding times and preservation requirements are intended to provide representative data.

10.1.2 Comparability

Comparability is the degree of confidence with which one data set can be compared to another. Comparability between this investigation, and to the extent possible, with existing data will be maintained through consistent sampling and analytical methodology set forth in the GFSP and this GQAPP, SW-846 analytical methods with NYSDEC ASP Revision 2000 QA/QC requirements and Category B reporting deliverables, and through use of QA/QC procedures and appropriately trained personnel.

10.1.3 Completeness

Completeness is defined as a measure of the amount of valid data obtained from an event and/or investigation compared to the amount that was expected to be obtained under normal conditions. This will be determined upon assessment of the analytical results, as discussed in Section 10.6.

10.1.4 Precision

Precision is the measure of reproducibility of sample results. The goal is to maintain a level of analytical precision consistent with project objectives. To maximize precision, sampling and analytical procedures will be followed. All work for this investigation will adhere to established protocols presented in the SMP or task-specific work plan. Checks for analytical precision will include the analysis of MSDs, laboratory duplicates, and field duplicates. Checks for field measurement precision will include obtaining duplicate field measurements. Further discussion of precision QC checks is provided in Section 10.4.

10.1.5 Accuracy

Accuracy is the deviation of a measurement from the true value of a known standard. Both field and analytical accuracy will be monitored through initial and continuing calibration of instruments. In addition, internal standards, MS, blank spikes, and surrogates (system monitoring compounds) will be used to assess the accuracy of the laboratory analytical data. Further discussion of these QC samples is provided in Section 10.5.

10.2 Field Quality Control Checks

10.2.1 Field Measurements

To verify quality of data using field instrumentation, duplicate measurements will be obtained and reported for all field analytical measurements.

10.2.2 Sample Containers

Certified, clean sample containers in accordance with Exhibit I of the NYSDEC ASP Revision 2000 (Eagle Picher pre-cleaned containers or equivalent) will be supplied by the laboratory.

10.2.3 Field Duplicates

Field duplicates will be collected for groundwater and source material/soil samples to check reproducibility of sampling methods. Field duplicates will be prepared as discussed in the GFSP. In general, source material/soil and groundwater sample field duplicates will be analyzed at a 5% frequency (every 20 samples). Table 2 provides an estimated number of field duplicates for each applicable parameter and matrix.

10.2.4 Rinse Blanks

Rinse blanks are used to monitor cleanliness of sampling equipment and effectiveness of cleaning procedures. Rinse blanks will be prepared and submitted for analysis at a frequency of 1 per day (when sample equipment cleaning occurs) or once for every 20 samples collected, whichever is less. Rinse blanks will be prepared by filling sample containers with analyte-free water (supplied by the laboratory), which has been routed through a cleaned sampling device. When dedicated sampling devices are used or sample containers are used to collect the samples, rinse blanks will not be necessary. Table 2 provides an estimated number of rinse blanks collected during the investigation activities.

10.2.5 Trip Blanks

Trip blanks will be used to assess whether site samples have been exposed to non-site-related volatile constituents during storage and transport. Trip blanks will be analyzed at a frequency of once per day, per cooler containing groundwater samples to be analyzed for VOCs. A trip blank will consist of a container filled with analyte-free water (supplied by the laboratory), which remains unopened with field samples throughout the sampling event. Trip blanks will only be analyzed for aqueous VOCs. Table 2 provides an estimated number of trip blanks collected for each matrix and parameter during the investigation activities.

10.3 Analytical Laboratory Quality Control Checks

Internal QC procedures are specified in the analytical methods. These specifications include types of QC checks required (method blanks, reagent/preparation blanks, MS/MSDs, calibration standards, internal standards, surrogate standards, specific calibration check standards, laboratory duplicate/replicate analysis), compounds and concentrations to be used, and the QC acceptance criteria.

10.3.1 Method Blanks

Method blanks will serve as a measure of contamination attributable to a variety of sources, including glassware, reagents, and instrumentation. The method blank will be initiated at the beginning of an analytical procedure and is carried through the entire process.

10.3.2 Matrix Spike/Matrix Spike Duplicates

The MS will serve as a measure of method accuracy in a given matrix. The MS and the MSDs together will serve as a measure of method precision.

10.3.3 Surrogate Spikes

Surrogate spikes are organic compounds that have similar properties to those being tested. They will serve as indicators of method performance and accuracy in organic analyses.

10.3.4 Laboratory Duplicates

Laboratory duplicates will serve to measure method precision in inorganic and supplemental analyses.

10.3.5 Calibration Standards

Calibration check standards analyzed within a particular analytical series provide insight regarding the instruments' stability. A calibration check standard will be analyzed at the beginning and end of an analytical series, or periodically throughout a series containing a large number of samples.

In general, calibration check standards will be analyzed after every 12 hours or more frequently, as specified in the applicable analytical method. In analyses where internal standards are used, a calibration check standard will only be analyzed in the beginning of an analytical series. If results of the calibration check standard exceed specified tolerances, then all samples analyzed since the last acceptable calibration check standard will be reanalyzed.

Laboratory instrument calibration standards will be selected utilizing the guidance provided in the analytical methods, as summarized in Section 12.

10.3.6 Internal Standards

Internal standard areas and retention times will be monitored for organic analyses performed by gas chromatograph/mass spectrometer methods. Method-specified internal standard compounds will be spiked into all field samples, calibration standards, and QC samples after preparation and prior to analysis. If internal standard areas in one or more samples exceed the specified tolerances, then cause will be investigated, the instrument will be recalibrated, if necessary, and all affected samples will be reanalyzed.

The acceptability of internal standard performance will be determined using guidance provided within the analytical methods.

10.3.7 Reference Standards/Control Samples

Reference standards are standards of known concentration and independent in origin from the calibration standards. The intent of reference standard analysis is to provide insight into the analytical proficiency within an analytical series. This includes preparation of calibration standards, validity of calibration, sample preparation, instrument set up, and premises inherent in quantitation. Reference standards will be analyzed at frequencies specified within the analytical methods.

10.4 Data Precision Assessment Procedures

Field precision is difficult to measure because of temporal variations in field parameters. However, precision will be controlled through the use of experienced field personnel, properly calibrated meters, and duplicate field measurements. Field duplicates will be used to assess precision for the entire measurement system, including sampling, handling, shipping, storage, preparation, and analysis.

Laboratory data precision for organic analyses will be monitored through the use of MSDs, laboratory duplicate, and field duplicates as identified in **Table 2**.

Precision of data will be measured by calculation of the relative percent differences (RPDs) of duplicate sample sets.

The RPD can be calculated by the following equation:

$$RPD = \frac{(A-B)}{(A+B)/2} \times 100$$

Where:

A = analytical result from one of two duplicate measurements

B = analytical result from the second measurement

Precision objectives for MSD and laboratory duplicate analyses are identified in the NYSDEC ASP Revision 2000.

10.5 Data Accuracy Assessment Procedures

Accuracy of field measurements will be controlled by experienced field personnel, properly calibrated field meters, and adherence to established protocols. Accuracy of field meters will be assessed by review of calibration and maintenance logs.

Laboratory accuracy will be assessed via the use of MS, surrogate spikes, and internal standards. Where available and appropriate, QA performance standards will be analyzed periodically to assess laboratory accuracy. Accuracy will be calculated as a percent recovery as follows:

$$\text{Accuracy} = \frac{A-X}{B} \times 100$$

Where:

A = value measured in spiked sample or standard

X = value measured in original sample

B = true value of amount added to sample or true value of standard

This formula is derived under the assumption of constant accuracy over the original and spiked measurements. If any accuracy calculated by this formula is outside of acceptable levels, data will be evaluated to determine whether the deviation represents unacceptable accuracy, or variable, but acceptable accuracy. Accuracy objectives for MS recoveries and surrogate recovery objectives are identified in the NYSDEC ASP, 2000 Revision.

10.6 Data Completeness Assessment Procedures

Completeness of a field or laboratory data set will be calculated by comparing the number of samples collected or analyzed to the proposed number.

$$\text{Completeness} = \frac{\text{No. Valid Samples Collected or Analyzed}}{\text{No. Proposed Samples Collected or Analyzed}} \times 100$$

As general guidelines, overall project completeness is expected to be at least 90%. The assessment of completeness will require professional judgment to determine data usability for intended purposes.

11. INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

Preventive maintenance schedules have been developed for both field and laboratory instruments. A summary of maintenance activities to be performed is presented below.

11.1 Field Instruments and Equipment

Prior to any field sampling, each piece of field equipment will be inspected to confirm that it is operational. If the equipment is not operational, it must be serviced prior to use. All meters that require charging or batteries will be fully charged or have fresh batteries. If instrument servicing is required, it is the responsibility of the Field Activities Task Manager to follow the maintenance schedule and arrange for prompt service.

Field instrumentation to be used in this study includes meters to measure pH, ORP, turbidity, temperature, conductivity, dissolved oxygen, and groundwater levels. Field equipment also includes sampling devices for groundwater. A logbook will be kept for each field instrument. Each logbook contains records of operation, maintenance, calibration, and any problems and repairs. The Field Activities Task Manager will review calibration and maintenance logs.

Field equipment returned from a site will be inspected to confirm it is in working order. This inspection will be recorded in the logbook or field notebooks as appropriate. It will also be the obligation of the last user to record any equipment problems in the logbook.

Non-operational field equipment will be either repaired or replaced. Appropriate spare parts will be made available for field meters. A summary of preventive maintenance requirements for field instruments, and details regarding field equipment maintenance, operation, and calibration, are provided in the GFSP.

11.2 Laboratory Instruments and Equipment

11.2.1 General

Only qualified personnel will service instruments and equipment. Repairs, adjustments, and calibrations are documented in the appropriate logbook or data sheet.

11.2.2 Instrument Maintenance

Preventive maintenance of laboratory equipment will follow guidelines recommended by the manufacturer. A malfunctioning instrument will be repaired by in-house staff or through a service call by the manufacturer, as appropriate.

The laboratory will maintain a sufficient supply of spare parts for its instruments to minimize downtime. Whenever possible, backup instrumentation will be retained.

Whenever practical, analytical equipment will be maintained under a service contract. The contract allows for preventative system maintenance and repair on an “as-needed” basis. The laboratory has sufficiently trained staff to allow for the day-to-day maintenance of equipment.

11.2.3 Equipment Monitoring

On a daily basis, the operation of balances, incubators, ovens, refrigerators, and water purification systems will be checked and documented. Any discrepancies will be immediately reported to the appropriate laboratory personnel for resolution.

12. INSTRUMENT CALIBRATION AND FREQUENCY

12.1 Field Equipment Calibration Procedures and Frequency

Specific procedures for performing and documenting calibration and maintenance for equipment measuring conductivity, temperature, pH, groundwater levels, and surface-water levels are provided in the GFSP. Calibration checks will be performed daily when measuring pH, ORP, turbidity, temperature, conductivity, and dissolved oxygen. Field equipment operation, calibration, and maintenance procedures are provided in the GFSP.

12.2 Laboratory Equipment Calibration Procedures and Frequency

Instrument calibration will follow specifications provided by the instrument manufacturer or specific analytical method used. Analytical methods for target constituents are identified separately below.

Volatile Organics

Equipment calibration procedures will follow guidelines presented in NYSDEC ASP 2000 Revision, Exhibit E, Part III.

Semivolatile Organics

Equipment calibration procedures will follow guidelines presented in NYSDEC ASP 2000 Revision, Exhibit E, Part IV.

Metals and Cyanide

Equipment calibration procedures will follow guidelines presented in NYSDEC ASP 2000 Revision, Exhibit E, Part VII.

Total Organic Carbon

Equipment calibration procedures will follow guidelines presented in Lloyd Kahn Method.

Supplemental Parameters

Additional parameters (chemical oxygen demand, nitrate, ammonia, sulfate, sulfide, orthophosphate, alkalinity, methane, reactive sulfide, and reactive cyanide) will be calibrated according to their respective methods, following the guidance presented in NYSDEC ASP 2000, Exhibit E, Part VIII.

13. INSPECTION/ACCEPTANCE REQUIREMENTS FOR SUPPLIES AND CONSUMABLES

The laboratory shall inspect/test all supplies and consumables prior to use with samples. Documentation shall be maintained for all associated testing and analyses.

14. DATA MANAGEMENT

The purpose of the data management is to confirm that all of the necessary data are accurate and readily accessible to meet analytical and reporting objectives of the project. Field investigations will encompass a large number of samples and a variety of sample matrices and analytes from a large geographic area. From the large amount of resulting data, the need arises for a structured, comprehensive, and efficient program for management of data.

The data management program established for the project includes field documentation and sample QA/QC procedures, methods for tracking and managing data, and a system for filing all site-related information. More specifically, data management procedures will be employed to efficiently process information collected such that data are readily accessible and accurate. These procedures are described in detail in the following section.

The data management plan has five elements:

1. Sample Designation System
2. Field Activities
3. Sample Tracking and Management
4. Data Management System
5. Document Control and Inventory

14.1 Sample Designation System

A concise and easily understandable sample designation system is an important part of project sampling activities. It provides a unique sample number that will facilitate both sample tracking and easy resampling of select locations to evaluate data gaps, if necessary. The sample designation system to be employed during sampling activities will be consistent, yet flexible enough to accommodate unforeseen sampling events or conditions. A combination of letters and numbers will be used to yield a unique sample number for each field sample collected.

14.2 Field Activities

Field activities designed to gather information necessary to make decisions regarding offsite areas require consistent documentation and accurate record keeping. During site activities, standardized procedures will be used for documentation of field activities, data security, and QA. These procedures are described in further detail in the following subsections.

14.2.1 Field Documentation

Complete and accurate record keeping is a critical component of field investigation activities. When interpreting analytical results and identifying data trends, investigators realize that field notes are an important part of the review and validation process. To confirm that all aspects of field investigation are thoroughly documented, several different information records, each with its own specific reporting requirements, will be maintained, including:

- field logs
- instrument calibration records
- chain-of-custody forms

A description of each of these types of field documentation is provided below.

Field Logs

The personnel performing the activities will keep field logs that detail all observations and measurements made during the investigation. Data will be recorded directly into site-dedicated, bound notebooks, with each entry dated and signed. To confirm at any future date that notebook pages are not missing, each page will be sequentially numbered. Erroneous entries will be corrected by crossing out the original entry, initialing it, and then documenting the proper information. In addition, certain media sampling locations will be surveyed to accurately record their locations. The survey crew will use their own field logs and will supply the sampling location coordinates to the File Custodian.

Instrument Calibration Records

As part of data quality assurance procedures, field monitoring and detection equipment will be routinely calibrated. Instrument calibration confirms that equipment used is of the proper type, range, accuracy, and precision to provide data compatible with specified requirements and desired results. Calibration procedures for the various types of field instrumentation are described in Section 12.1. In order to demonstrate that established calibration procedures have been followed, calibration records will be prepared and maintained to include, as appropriate, the following:

- calibration date and time
- type and identification number of equipment
- calibration frequency and acceptable tolerances
- identification of individual(s) performing calibration
- reference standards used
- calibration data
- information on calibration success or failure

The calibration record will serve as a written account of monitoring or detection equipment QA. All erratic behavior or failures of field equipment will be subsequently recorded in the calibration log.

Chain of Custody Forms

Chain of custody forms are used as a means of documenting and tracking sample possession from time of collection to the time of disposal. A chain of custody form will accompany each field sample collected, and one copy of the form will be filed in the field office. All field personnel will be briefed on the proper use of the chain of custody procedure. A more thorough description of the chain of custody forms is located in the Standard Operating Procedures.

14.2.2 Data Security

Measures will be taken during the field investigation to confirm that samples and records are not lost, damaged, or altered. When not in use, all field notebooks will be stored at the field office in a locked, fireproof cabinet. Access to these files will be limited to the field personnel who utilize them.

14.3 Sample Management and Training

A record of all field documentation, as well as analytical and QA/QC results, will be maintained to confirm the validity of data used in the site analysis. To effectively execute such documentation, carefully constructed sample tracking and data management procedures will be used throughout the sampling program.

Sample tracking will begin with the completion of chain of custody forms, as described in Section 8.5.3. On a daily basis, the completed chain of custody forms associated with samples collected that day will be faxed from the project office to the QA Manager (QAM). Copies of all completed chain of custody forms will be maintained in the field office. On the following day, the QAM will telephone the laboratory to verify receipt of samples.

When analytical data are received from the laboratory, the QAM will review the incoming analytical data packages against the information on the chains of custody to confirm that the correct analyses were performed for each sample and that results for all samples submitted for analysis were received. Any discrepancies noted will be promptly followed-up by the QAM.

14.4 Data Management System

In addition to the sample tracking system, a data management system may be implemented. The central focus of the data management system will be the development of a personal computer-based project database. The project database, to be maintained by the Database Administrator, will combine pertinent geographical, field, and analytical data. Information that will be used to populate the database will be derived from three primary sources: surveying of sampling locations, field observations, and analytical results. Each of these sources is discussed in the following sections.

14.4.1 Computer Hardware

If required, the database will be constructed on Pentium®-based personal computer work stations connected through a Novell network server. The Novell network will provide access to various hardware peripherals, such as, but not limited to, laser printers, backup storage devices, image scanners, and modems. Computer hardware will be upgraded to industrial and corporate standards, as necessary, in the future.

14.4.2 Computer Software

If required, the database will be written in Microsoft Access, running in a Windows operating system.

14.4.3 Surveying Information

In general, each location sampled will be surveyed to confirm that accurate documentation of sample locations for mapping and geographic information system purposes (if appropriate) to facilitate the resampling of select sample locations during future monitoring programs, if needed, and for any potential remediation activities. The surveying activities that will occur in the field will consist of the collection of information that will be used to compute a northing and easting in state plane coordinates for each sample location and the collection of information to compute elevations relative to the National Geodetic Vertical Datum of 1988 for select sample locations, as appropriate. All field books associated with the surveying activities will be stored as a record of the project activities.

Conventional surveying techniques will be used to gather information, such as the angle and distance between the sample location and the control monument, as well as point attributes. Control monuments will be established using global positioning system techniques. The surveying software allows the rapid computation of a location’s state plane coordinates.

Differential leveling techniques will be used to gather information to be used to compute a sample location's (or top-of-casing for groundwater monitoring wells) elevation. During the differential leveling process, which includes at least one benchmark of known elevation, detailed field notes will be kept in a field book.

14.4.4 Field Observations

An important part of information that will ultimately reside in the data management system for use during the project will originate in the observations that are recorded in the field.

Following each sampling event, a status memorandum may be prepared by the field personnel who performed the sampling activities. The purpose of the status memo is to present a summary and a record of the sampling event. Topics to be discussed include the locations sampled, the sampling methodologies used, QA/QC procedures, blind duplicate and MS/MSD sample identification numbers, equipment decontamination procedures, personnel involved in the activity, and any other noteworthy events that occurred.

Tables are typically attached to the memorandum and are used to summarize measurements that were recorded in the field books. It is anticipated that these tables will be developed using a personal computer spreadsheet program to reduce possible transcription error and to facilitate the transfer of information to the data management system. For example, for soil samples, the table would present the sampling date and time, soil depth, depth of soil recovered in a given core, the depth increment submitted for analysis, and a description of the lithology.

Status memos are valuable tools to keep project personnel informed on the details of the field activities and are also invaluable during the development of the final report. Each status memo will be reviewed for accuracy and completeness by the respective sampling activity manager. Following the approval and finalization of each memo, the status memo will be used to transfer field observations into the data management system.

All pertinent field data will be manually entered into the appropriate database tables from the chain of custody forms and field notebooks.

14.4.5 Analytical Results

Analytical results provided by the laboratory will generally be available in both a digital and a hard copy format. Upon receipt of each analytical package, the original chain of custody form will be placed in the project files. The data packages will be examined to confirm that the correct analyses were performed for each sample submitted and that all of the analyses requested on the chain of custody form were performed. If discrepancies are noted, the QAM will be notified and will promptly follow up with the laboratory to resolve any issues.

Where appropriate, the data packages will be validated in accordance with the procedures presented in Section 20. Any data that does not meet the specified standards will be flagged pending resolution of the issue. The flag will not be removed from the data until the issue associated with the sample results is resolved. Although flags may remain for certain data, the use of that data may not necessarily be restricted.

Following completion of the data validation (if necessary), the digital files of analytical data will be processed to populate the appropriate database tables. Specific fields include:

- sample identification number
- date sampled
- date analyzed
- parameter name
- analytical result
- units
- detection limit
- qualifier(s)

The individual electronic data deliverables (EDDs) supplied by the laboratory in either an ASCII comma separated value format or in a Microsoft Excel 97 worksheet, will be loaded into the appropriate database table. Any analytical data that cannot be provided by the laboratory in electronic format will be entered manually.

After entry into the database, the EDD data will be compared to the field information previously entered into the database to confirm that all requested analytical data have been received.

14.4.6 Data Analysis and Reporting

The database management system will have several functions to facilitate review and analysis of the data. Data entry screens will be developed to assist in the keypunching of field observations. Routines will also be developed to permit the user to scan analytical data from a given site for a given media. Several output functions that have been developed by ARCADIS will be appropriately modified for use in the data management system.

A valuable function of the data management system will be the generation of tables of analytical results from the project databases. The capability of the data management system to directly produce tables reduces the redundant manual entry of analytical results during report preparation and precludes transcription errors that may occur otherwise. This data management system function creates a digital comma-delimited ASCII file of analytical results and qualifiers for a given media. The ASCII file is then processed through a spreadsheet, which transforms the comma-delimited file into a table of rows and columns. Tables of analytical data will be produced as part of data interpretation tasks and the reporting of data.

Another function of the data management system will be to create digital files of analytical results and qualifiers suitable for transfer to mapping/presentation software. A function has been created by ARCADIS that creates a digital file consisting of sample location number, state plane coordinates, sampling date, and detected constituents and associated concentrations and analytical qualifiers. The file is then transferred to an AutoCAD work station, where another program has been developed to plot a location's analytical data in a "box" format at the sample location (represented by the state plane coordinates). This routine greatly reduces the redundant keypunching of analytical results and facilitates the efficient production of interpretative and presentation graphics.

The data management system also has the capability of producing a digital file of select parameters that exists in one or more of the databases. This type of custom function is accomplished on an interactive basis and is best used for transferring select information into a number of analysis tools, such as statistical or graphing programs.

14.5 Document Control and Inventory

Each contractor performing intrusive work within potentially MGP-impacted areas is required to maintain project files. Copies of appropriate portions of the project files will be sent to:

- NYSDEC Project Manager
- RGE Project manager

ARCADIS maintains project files in its Fairport, New York office. Each client project is assigned a file/job number (e.g., for the remedial activities, 130.42). Each file is then broken down into the following subfiles:

1. Agreements/Proposals (filed chronologically)
2. Change Orders/Purchase Orders (filed chronologically)
3. Invoices (filed chronologically)
4. Project Management (filed by topic)
5. Correspondence (filed chronologically)
6. Notes and Data (filed by topic)
7. Public Relations Information (filed by topic)
8. Regulatory Documents (filed chronologically)
9. Marketing Documents (filed chronologically)

10. Final Reports/Presentations (filed chronologically)
11. Draft Reports/Presentations (filed chronologically)
12. Documents Prepared by Others (filed chronologically)

Originals, when possible, are placed in the files. These are the central files and will serve as the site-specific files for the off-site investigations.

15. ASSESSMENT AND RESPONSE ACTIONS

Performance and systems audits will be completed in the field and the laboratory during the investigation activities, as described below.

15.1 Field Audits

The following field performance and systems audits will be completed during this project.

15.1.1 Performance Audits

The appropriate Task Manager will monitor field performance. Field performance audit summaries will contain an evaluation of field measurements and field meter calibrations to verify that measurements are taken according to established protocols. The project QAM will review all field reports and communicate concerns to the Project Manager and/or Task Managers, as appropriate. In addition, the QAM will review the rinse and trip blank data to identify potential deficiencies in field sampling and cleaning procedures.

15.1.2 Internal Systems Audits

A field internal systems audit is a qualitative evaluation of all components of field QA/QC. The systems audit compares scheduled QA/QC activities from this document with actual QA/QC activities completed. The appropriate Task Manager will periodically confirm that work is being performed consistent with the SMP, GFSP, GHASP.

15.2 Laboratory Audits

The laboratory will perform internal audits consistent with NYSDEC ASP, 2000 Revision, Exhibit E.

In addition to the laboratory's internal audits and participation in state and federal certification programs, the laboratory sections at the laboratory are audited by representatives of the regulatory agency issuing certification. Audits are usually conducted on an annual basis and focus on laboratory conformance to the specific program protocols for which the laboratory is seeking certification. The auditor reviews sample handling and tracking documentation, analytical methodologies, analytical supportive documentation, and final reports. The audit findings are formally documented and submitted to the laboratory for corrective action, if necessary.

RGE reserves the right to conduct an on-site audit of the laboratory prior to the start of analyses for the project. Additional audits may be performed during the course of the project, as deemed necessary.

15.3 Corrective Action

Corrective actions are required when field or analytical data are not within the objectives specified in this GQAPP, GFSP, SMP, or task-specific work plan. Corrective actions include procedures to promptly investigate, document, evaluate, and correct data collection and/or analytical procedures. Field and laboratory corrective action procedures are described below.

15.3.1 Field Procedures

When conducting field work, if a condition is noted that would have an adverse effect on data quality, corrective action will be taken so as not to repeat this condition. Condition identification, cause, and corrective action implemented will be documented on a Corrective Action Report Form and reported to the appropriate Project Manager and Task Manager.

Examples of situations that would require corrective actions are provided below:

1. Protocols, as defined by this GQAPP, GFSP, SMP, or task-specific work plan, have not been followed.
2. Equipment is not in proper working order or properly calibrated.
3. QC requirements have not been met.
4. Issues resulting from performance or systems audits.

Project personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities.

15.3.2 Laboratory Procedures

In the laboratory, when a condition is noted to have an adverse effect on data quality, corrective action will be taken so as not to repeat this condition. Condition identification, cause, and corrective action to be taken will be documented and reported to the appropriate Project Manager and Task Manager.

Corrective action may be initiated, at a minimum, under the following conditions:

1. Specific laboratory analytical protocols have not been followed.
2. Predetermined data acceptance standards are not obtained.
3. Equipment is not in proper working order or calibrated.
4. Sample and test results are not completely traceable.
5. QC requirements have not been met.
6. Issues resulting from performance or systems audits.

Laboratory personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities.

16. REPORTS TO MANAGEMENT

16.1 Internal Reporting

The analytical laboratory will submit analytical reports to the contractor for review. If required, the contractor will in turn, submit the reports to the data validator for review. Supporting data (i.e., historic data, related field or laboratory data) will also be reviewed to evaluate data quality, as appropriate. The QAM will incorporate results of the data validation reports (if required) and assessments of data usability into a summary report (if required) that will be submitted to the Project Manager and appropriate Task Managers. If required, this GQAPP will be filed in the project file and will include the following:

1. Assessment of data accuracy, precision, and completeness for both field and laboratory data.
2. Results of the performance and systems audits.
3. Significant QA/QC problems, solutions, corrections, and potential consequences.
4. Analytical data validation report.

16.2 Reporting

Upon sample transport to the laboratory, a copy of the chain of custody will be forwarded to RGE. Upon receipt of the ASP – Category B Data Package from the laboratory, the QAM will determine if the data package has met the required DQOs. The analytical data package will be submitted to RGE's Project Manager and will also be incorporated into the reports.

17. DATA REVIEW, VALIDATION, AND VERIFICATION

After field and laboratory data are obtained, these data may be subject to:

1. Validation of the data.
2. Reduction or manipulation of the data mathematically or otherwise into meaningful and useful forms.
3. Organization, interpretation, and reporting of the data.

17.1 Field Data Reduction, Validation, and Reporting

17.1.1 Field Data Reduction

Information that is collected in the field through visual observation, manual measurement, and/or field instrumentation will be recorded in field notebooks, log sheets, and/or other appropriate forms. Such data will be reviewed by the appropriate Task Manager for adherence to the work plan and consistency of data. Any concerns identified as a result of this review will be discussed with the field personnel, corrected if possible, and, as necessary, incorporated into the data evaluation process.

17.1.2 Field Data Validation

Field data calculations, transfers, and interpretations will be conducted by the field personnel and reviewed for accuracy by the appropriate Task Manager and the QAM. Task Managers will recalculate at least 5% of all data reductions. Field documentation and data reduction prepared by field personnel will be reviewed by the appropriate Task Manager and QAM. All logs and documents will be checked for:

1. general completeness
2. readability
3. usage of appropriate procedures
4. appropriate instrument calibration and maintenance
5. reasonableness in comparison to present and past data collected
6. correct sample locations
7. correct calculations and interpretations

17.1.3 Field Data Reporting

Where appropriate, field data forms and calculations will be processed and included in appendices to the reports. The original field logs, documents, and data reductions will be kept in the project file.

17.2 Laboratory Data Reduction, Review, and Reporting

17.2.1 Laboratory Data Reduction

Laboratory analytical data will be directly transferred from the instrument to the computer or the data reporting form (as applicable). Calculation of sample concentrations will be performed using the appropriate regression analysis program, response factors, and dilution factors (where applicable).

17.2.2 Laboratory Data Review

All data will be subject to multi-level review by the laboratory. The group leader will review all data reports prior to release for final data report generation, and the laboratory director will review a cross section of the final data reports. All final data reports are reviewed by the laboratory QAM prior to shipment.

If discrepancies or deficiencies exist in the analytical results, then corrective action will be taken, as discussed in Section 15. Deficiencies discovered as a result of internal data review, as well as the corrective actions to be used to rectify the situation, will be documented on a Corrective Action Form. This form will be submitted to the Project Manager.

18. VALIDATION AND VERIFICATION METHODS

Data validation entails a review of the QC data and the raw data to verify that the laboratory was operating within required limits, the analytical results are correctly transcribed from the instrument, and which, if any, environmental samples are related to any out-of-control QC samples. The objective of data validation is to identify any questionable or invalid laboratory measurements.

Data validation will consist of data screening, checking, reviewing, editing, and interpreting to document analytical data quality and determine if the quality is sufficient to meet the DQOs. The data validation will also include a review of completeness and compliance, including the elements provided in **Table 4**.

The data validator will use the most recent versions of the USEPA functional guidelines for data validation with NYSDEC ASP 2000 Revision, QA/QC and reporting deliverables requirements available at the time of project initiation and for the entire duration of the project, as guidance, where appropriate.

The data validator will verify reduction of laboratory measurements and laboratory reporting of analytical parameters are in accordance with the procedures specified for each analytical method (i.e., perform laboratory calculations in accordance with the method-specific procedure).

If required, upon receipt of the laboratory data, the following reduction, validation, and reporting scheme will be executed by the data validator:

1. Laboratory data will be screened to confirm that the necessary QC procedures (e.g., detection limit verification, initial calibration, continuing calibration, duplicates, spikes, blanks) have been performed. QC information not included or of insufficient frequency will be identified in the validation report, including a discussion of the implications.
2. QC supporting information will subsequently be screened to identify QC data outside established control limits. If out-of-control data are discovered, documentation of appropriate corrective action will be reviewed. Out-of-control data without appropriate corrective action shall result in designation of the affected data as qualified or rejected, as appropriate.

   It should be noted that the existence of qualified results does not automatically invalidate data. This point is repeatedly emphasized in the USEPA functional guidelines for data validation and is inherently acknowledged by the very existence of the data validation/flagging guidelines. The goal to produce the best possible data does not necessarily mean producing data without QC qualifiers. Qualified data can provide useful information.

Resolution of any issues regarding laboratory performance or deliverables will be handled between the data validator, laboratory Project Manager, and the contractor Project Manager.

Upon completion of the data validation (if required), a data usability summary report addressing the following topics will be prepared.

1. assessment of the data package
2. description of any protocol deviations
3. failures to reconcile reported and/or raw data
4. assessment of any compromised data

5. laboratory case narrative
6. overall appraisal of the analytical data
7. table of site name, sample quantities, data submitted to the laboratory, year of protocol used, matrix, and fractions analyzed

19. RECONCILIATION WITH USER REQUIREMENTS

The data results will be examined to determine the performance that was achieved for each data usability criteria. The performance will then be compared with the project objectives. Of particular note will be samples at or near action levels. All deviations from objectives will be noted. Additional action may be warranted when performance does not meet performance objectives for critical data. Action options may include any or all of the following:

- retrieval of missing information
- request for additional explanation or clarification
- reanalysis of sample from extract (when appropriate)
- recalculation or reinterpretation of results by the laboratory

These actions may improve the data quality, reduce uncertainty, and may eliminate the need to qualify or reject data.

If these actions do not improve the data quality to an acceptable level, the following actions may be taken:

- extrapolation of missing data from existing data points
- use of historical data
- evaluation of the critical/noncritical nature of the sample

If the data gap cannot be resolved by these actions, an evaluation of the data bias and potential for false negatives and positives can be performed. If the resultant uncertainty level is unacceptable, then the following action must be taken:

- additional sample collection and analysis

20. REFERENCES

American Society for Testing and Materials. Annual Book of ASTM Standards. American Society for Testing and Materials. West Conshohochkton, PA. (1996).

United States Environmental Protection Agency. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. EPA-540/R-94-013. (February 1994a).

United States Environmental Protection Agency. *Contract Laboratory Program National Functional Guidelines for Organic Data Review*. EPA-540/R-94-012. (February 1994b).

United States Environmental Protection Agency. *NEIC Policies and Procedures Manual*. EPA-330/9-78-001R. National Enforcement Investigations Center. (May 1978, Revised August 1991).

United States Environmental Protection Agency. *Interim Guidance and Specifications for Preparing Quality Assurance Project Plans*. QAMS-005/80. Office of Research and Development. (December 1980).

United States Environmental Protection Agency. *Methods for Chemical Analysis of Water and Waste*. EPA-600/4-79-020, Revised. EMSL-Cincinnati. (March, 1983).

United States Environmental Protection Agency. *Test Methods for Evaluating Solid Waste*. SW-846 3rd Edition, Update 3. Office of Solid Waste (December 1996).

United States Environmental Protection Agency. *EPA Requirements for Quality Assurance Project Plans for Environmental Operations*. EPA-QA/R-5. Quality Assurance Division. (March 2001).

TABLES

Table 1
Parameter, Methods, and Quantitation Limits

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Parameter	Quantitation Limit[1]	
Volatile Organics Method 8260	**Water (µg/L)**	**Soil (µg/kg)[2]**
Chloromethane	5	5
Bromomethane	5	5
Vinyl Chloride	5	5
Chloroethane	5	5
Methylene Chloride	3	3
Acetone	5	5
Carbon Disulfide	5	5
1,1-Dichloroethylene	5	5
1,1-Dichloroethane	5	5
1,2-Dichloroethylene (total)	5	5
Chloroform	5	5
1,2-Dichloroethane	2	2
2-Butanone	5	5
1,1,1-Trichloroethane	5	5
Carbon Tetrachloride	2	2
Bromodichloromethane	1	1
1,2-Dichloropropane	1	1
cis-1,3-Dichloropropene	5	5
Trichloroethane	5	5
Dibromochloromethane	5	5
1,1,2-Trichloroethane	3	3
Benzene	1	1
trans-1,3-Dichloropropene	5	5
Bromoform	4	4
4-Methyl-2-pentanone	5	5
2-Hexanone	5	5
Tetrachloroethene	1	1
Toluene	5	5
1,1,2,2-Tetrachloroethane	1	1
Chlorobenzene	5	5
Ethylbenzene	4	4
Styrene	5	5
2-Chloroethyl Vinyl Ether	5	5
1,2-Dichlorobenzene	5	5
1,3-Dichlorobenzene	5	5
1,4-Dichlorobenzene	5	5
Vinyl Acetate	5	5
Total Xylenes	5	5
Semivolatile Organics Method 8270	**Water (µg/L)**	**Soil (µg/kg)**
1,2,4-Trichlorobenzene	1	33
1,2-Dichlorobenzene	10	330
1,2-Diphenylhydrazine	10	330
1,3-Dichlorobenzene	10	330
1,4-Dichlorobenzene	10	330
1,4-Dioxane	10	330
2,4,5-Trichlorophenol	10	330
2,4,6-Trichlorophenol	10	330
2,4-Dichlorophenol	10	330

Table 1
Parameter, Methods, and Quantitation Limits

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Parameter	Quantitation Limit[1]	
Semivolatile Organics Method 8270 (Cont'd.)	**Water (µg/L)**	**Soil (µg/kg)**
2,4-Dimethylphenol	10	330
2,4-Dinitrophenol	40	1300
2,4-Dinitrotoluene	2	67
2,6-Dinitrotoluene	2	67
2-Chloronaphthalene	10	330
2-Chlorophenol	10	330
2-Methylnaphthalene	10	330
2-Methylphenol	10	330
2-Nitroaniline	20	670
2-Nitrophenol	10	330
3,3'-Dichlorobenzidene	20	670
3-Nitroaniline	20	670
4,6-Dinitro-2-methylphenol	40	1300
4-Bromophenyl-phenylether	10	330
4-Chloro-3-methylphenol	10	330
4-Chloroaniline	10	330
4-Chlorophenyl-phenylether	10	330
4-Methylphenol	10	330
4-Nitroaniline	20	670
4-Nitrophenol	40	1300
Acenaphthene	10	330
Acenaphthylene	10	330
Acetophenone	10	330
Aniline	10	330
Anthracene	10	330
Atrazine	10	330
Benzaldehyde	10	330
Benzidine	40	1300
Benzo(a)anthracene	1	33
Benzo(a)pyrene	1	33
Benzo(b)fluoranthene	1	33
Benzo(g,h,i)perylene	10	330
Benzo(k)fluoranthene	1	33
Benzoic Acid	10	330
Benzyl Alcohol	10	330
bis(2-chloroethoxy)methane	10	330
bis(2-chloroethyl)ether	1	33
bis(2-chloroisopropyl)ether	10	330
bis(2-ethylhexyl)phthalate	10	330
Butylbenzylphthalate	10	330
Caprolactam	10	330
Carbazole	10	330
Chrysene	10	330
Dibenzo(a,h)anthracene	1	33
Dibenzofuran	10	330
Diethylphthalate	10	330
Dimethylphthalate	10	330
Di-n-butyl phthalate	10	330
Di-n-octyl phthalate	10	330

Table 1
Parameter, Methods, and Quantitation Limits

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Parameter	Quantitation Limit[1]	
Semivolatiles Method 8270 (Cont'd.)	**Water (µg/L)**	**Soil (µg/kg)**
Diphenyl	10	330
Fluoranthene	10	330
Fluorene	10	330
Hexachlorobenzene	1	33
Hexachlorobutadiene	2	67
Hexachlorocyclopentadiene	10	330
Hexachloroethane	1	33
Indeno(1,2,3-cd)pyrene	1	33
Isophorone	10	330
N,N-Dimethylaniline	1	33
Naphthalene	10	330
Nitrobenzene	1	33
N-Nitrosodimethylamine	10	330
N-Nitroso-di-n-propylamine	1	33
N-Nitrosodiphenylamine	10	330
Pentachlorophenol	40	1300
Phenanthrene	10	330
Phenol	10	330
Pyrene	10	330
Pyridine	10	330
TAL Metals (6010/7470)	**Water (µg/L)**	**Soil (µg/kg)**
Aluminum	--	40
Antimony	--	2
Arsenic	--	1
Barium	--	40
Beryllium	--	0.4
Cadmium	--	1
Calcium	--	1000
Chromium	--	2
Cobalt	--	10
Copper	--	5
Iron	--	30
Lead	--	1
Magnesium	--	1000
Manganese	--	3
Mercury	--	0.033
Nickel	--	8
Potassium	--	1000
Selenium	--	1
Silver	--	2
Sodium	--	1000
Thallium	--	2
Vanadium	--	10
Zinc	--	6
Supplemental Parameters	**Water (µg/L)**	**Soil (mg/kg)**
Total Organic Carbon (Lloyd Kahn)	NA	100
Chloride Method 325.3	1,000	--

Table 1
Parameter, Methods, and Quantitation Limits

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Parameter	Quantitation Limit[1]	
Supplemental Parameters (Cont'd.)	**Water (µg/L)**	**Soil (mg/kg)**
Nitrate Method 353.2	100	--
Ammonia Method 350.1	100	--
Iron Method 200.7	150	--
Manganese Method 200.7	15	--
Sulfate Method 375.4	5,000	--
Sulfide Method 376.1	1,000	--
Orthophosphate Method 365.2	30	--
Alkalinity Method 310.1	5,000	--
Methane Method 3810	--	--
Reactive Sulfide	--	20
Reactive Cyanide	--	25
TCLP Benzene	--	1
Total Sulfur	--	50
Chemical Oxygen Demand	--	120

Notes:
[1] Specific quantitation limits are highly matrix dependent. The quantitation limits listed are for guidance and may not always be achievable due to matrix interference.
[2] Quantitation limits for source materials/soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for source materials/soil/sediment (calculated on a dry weight basis) will be higher.
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Table 2
Environmental and Quality Control Analyses

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Environmental Sample Matrix/ Laboratory Parameters	Field QC Analyses					Laboratory QC Analyses[1,2]	
	Trip Blank	Field Duplicate	Rinse Blank[3]	MS	MSD	MSB	Lab Duplicate
Soils							
Volatile Organics Method 8260	--	1/20	1/20	1/20	1/20	1/20	--
Semivolatile Organics Method 8270	--	1/20	1/20	1/20	1/20	1/20	--
Polychlorinated Biphenyls (PCBs) Method 8082	--	1/20	1/20	1/20	1/20	1/20	--
TAL Metals Method 6010 (Mercury Method 7470/7471) (Cyanide Method 9010)	--	1/20	1/20	1/20	1/20	1/20	--
Total Sulphur Bomb Method D129	--	--	--	--	--	--	--
Chemical Oxygen Demand Hach Method 8034	--	--	--	--	--	--	--
Total Organic Carbon (TOC) (Lloyd Kahn)	--	1/20	--	1/20	1/20	1/20	--
TCLP Benzene (1311/8260)	--	--	--	--	--	--	--

Table 2
Environmental and Quality Control Analyses

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Environmental Sample Matrix/ Laboratory Parameters	Field QC Analyses					Laboratory QC Analyses[1,2]	
	Trip Blank	Field Duplicate	Rinse Blank[3]	MS	MSD	MSB	Lab Duplicate
Reactive Sulfide Method SW846 Chapter 7.3	--	--	--	--	--	--	--
Reactive Cyanide Method SW846 Chapter 7.3	--	--	--	--	--	--	--
Groundwater							
Volatile Organics Method 8260	1/cooler	1/20	--	1/20	1/20	1/20	--
Semivolatile Organics Method 8270	--	1/20	--	1/20	1/20	1/20	--
Nitrate Method 353.2	--	1/20	--	--	--	--	--
Ammonia Method 350.1	--	1/20	--	--	--	--	--
Total Iron & Manganese Method 200.7	--	1/20	--	--	--	--	--
Dissolved Iron & Manganese Method 200.7	--	1/20	--	--	--	--	--
Sulfate Method 375.4	--	1/20	--	--	--	--	--
Sulfide Method 376.1	--	1/20	--	--	--	--	--
Orthophosphate Method 365.2	--	1/20	--	--	--	--	--

Table 2
Environmental and Quality Control Analyses

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Environmental Sample Matrix/ Laboratory Parameters	Field QC Analyses					Laboratory QC Analyses[1,2]	
	Trip Blank	Field Duplicate	Rinse Blank[3]	MS	MSD	MSB	Lab Duplicate
Alkalinity Method 310.1	--	1/20	--	--	--	--	--
Methane Method 3810	--	1/20	--	--	--	--	--

Notes:
[1] The number of laboratory QC analyses is based on the frequencies given for the number of environmental samples estimated, not including field QC analyses (i.e., rinse and trip blanks).
[2] Laboratory QC analyses are listed only for those parameters that must be performed on site samples. The laboratory is required to analyze QC samples for the remaining parameters at the frequency listed in the associated analytical method.
[3] Rinse blank samples will be collected only when nondedicated sampling devices are used. Rinse blanks will be collected at a frequency of one per day of use or one per 20 samples, whichever is less.
QC = quality control
MS = matrix spike
MSB = matrix spike blank
MSD = matrix spike duplicate
TAL = Target Analyte List.
TOC = total organic carbon
TCLP = toxicity characteristic leaching procedure
DNAPL = dense nonaqueous phase liquid

Table 3
Sample Containers, Preservation, and Holding Times Requirements

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Parameter	Container	Preservation	Maximum Holding Time from VTSR
Groundwater Samples			
Volatile Organics	(2) 40-mL Teflon®-lined septa (glass)	Cool 4ºC HCl to pH <2	7 days (unpreserved) 10 days (preserved)
Semivolatile Organics	(2) 1-liter containers (glass)	Cool 4ºC	5 days extraction; 40 days analysis
Nitrate	(1) 500-mL container (plastic/glass)	Cool 4ºC	48 hours (from collection)
Ammonia	(1) 500-mL container (plastic/glass)	H_2SO_4 Cool 4ºC	26 days
Iron	(1) 1,000-mL container (plastic/glass)	HNO_3 Cool 4ºC	6 months
Manganese	(1) 1,000-mL container (plastic/glass)	HNO_3 Cool 4ºC	6 months
Sulfate	(1) 500-ml container (plastic/glass)	Cool 4ºC	26 days
Sulfide	(1) 500-mL container (plastic/glass)	Cool 4ºC Zinc acetate NaOH to pH>12	5 days
Orthophosphate	(1) 500-mL container (plastic/glass)	Cool 4ºC Filter Immediately	48 hours (from collection)
Alkalinity	(1) 500-mL container (plastic/glass)	Cool 4ºC	12 days
Methane	(2) 40-mL Teflon®-lined septa (glass)	Cool 4ºC HCl to pH<2	12 days
Soil Samples			
Volatile Organics	(1) 4-oz container (glass)	Cool 4ºC	10 days
Semivolatile Organics	(1) 4-oz container (glass)	Cool 4ºC	5 days extraction; 40 days analysis
TAL Metals	(1) 250-mL wide mouth container (glass)	Cool 4ºC	180 days; 28 days for mercury; 14 days for cyanide
TOC	(1) 8-oz container (glass)	Cool 4ºC	14 days
Total Sulfur	(1) 10-oz container (glass)	Cool 4ºC	--
Reactive Sulfide	(1) 8-oz container (glass)	Cool 4ºC	5 days
Reactive Cyanide	(1) 8-oz container (glass)	Cool 4ºC	12 days
TCLP Benzene	(1) 4-oz container (glass)	Cool 4ºC	10 days
Chemical Oxygen Demand	(2) 4-oz wide mouth container (glass)	Cool 4ºC	26 days

Table 3
Sample Containers, Preservation, and Holding Times Requirements

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

Notes:
VTSR = Verifiable time of sample receipt. Samples must be delivered to laboratory within 48 hours from day of collection.
mL = milliliters
oz = ounce
^{o}C = degrees Celsius
TOC = total organic carbon
TCLP = toxicity characteristic leaching procedure
H_2SO_4 = sulfuric acid
HNO_3 = nitric acid
NaOH = sodium hydroxide

Table 4
Data Validation Checklist – Laboratory Analytical Data

Generic Quality Assurance Project Plan
Rochester Gas & Electric
Park Street Former MGP Site

REVIEW FOR COMPLETENESS	
1.	Chain of custody forms included.
2.	Sample preparation and analysis summary tables included.
3.	Quality assurance/quality control (QA/QC) summaries of analytical data included.
4.	Relevant calibration data included with analytical data.
5.	Instrument and method performance data included.
6.	Method detection limits documented.
7.	Data report forms of examples for calculations of concentrations.
8.	Raw data used in identification and quantification of the analysis required.
REVIEW OF COMPLIANCE	
1.	Data package completed.
2.	Quality Assurance Project Plan requirements for data met.
3.	QA/QC criteria met.
4.	Instrument type and calibration procedures met.
5.	Initial and continuing calibration met.
6.	Data reporting forms completed.
7.	Problems and corrective actions documented.

ATTACHMENT 1

Sample Chain of Custody Form

ARCADIS
Infrastructure, environment, facilities

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page ___ of ___

Lab Work Order #

Send Results to:

Contact & Company Name:	Telephone:
Address:	Fax:
City State Zip	E-mail Address:
Project Name/Location (City, State):	Project #:
Sampler's Printed Name:	Sampler's Signature:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix

Preservative								
Filtered (✓)								
# of Containers								
Container Information								

PARAMETER ANALYSIS & METHOD

REMARKS

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil | SE - Sediment | NL - NAPL/Oil
W - Water | SL - Sludge | SW - Sample Wipe
T - Tissue | A - Air | Other: _____

Special Instructions/Comments:

☐ **Special QA/QC Instructions(✓):**

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name:	Printed Name:	Printed Name:	Printed Name:
☐ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature:	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm:	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: _____	Date/Time:	Date/Time:	Date/Time:	Date/Time:

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by BBL

Arcadis of New York, Inc.

295 Woodcliff Drive

Third Floor

Suite 301

Fairport, New York 14450

Tel 585 385 0090

Fax 585 385 4198

www.arcadis.com

Appendix G

Generic Health and Safety Plan

ARCADIS Design & Consultancy for natural and built assets

RG&E

APPENDIX G
GENERIC HEALTH AND SAFETY PLAN

Park Street Former MGP Site

Geneseo, New York

June 2018

APPENDIX G GENERIC HEALTH AND SAFETY PLAN

Park Street Former MGP
Geneseo, New York

Prepared for:

RG&E

Prepared by:

Arcadis U.S., Inc.
295 Woodcliff Drive
Third Floor
Suite 301
Fairport
New York 14450
Tel 585 385 0090
Fax 585 385 4198

Our Ref.:

B0013138.0004

Date:

June 2018

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
BTEX	benzene, toluene, ethylbenzene, and xylene
CFR	Code of Federal Regulations
COC	constituent of concern
CPR	cardiopulmonary resuscitation
CRZ	contamination reduction zone
dBA	decibel
DEET	diethyltoluamide
°C	degrees Celsius
°F	degrees Fahrenheit
EMS	Emergency Medical Services
EZ	exclusion zone
FM	Factory Mutual Engineering Corporation
HASP	*Health and Safety Plan*
HSA	hollow-stem auger
HSO	Health and Safety Officer
HSS	Health and Safety Supervisor
II	Incident Investigation
JSA	Job Safety Analysis
kV	kilovolts
LEL	lower explosive limit
LPO	Loss Prevention Observation
LPS™	Loss Prevention System™
MGP	manufactured gas plant
MSDS	material safety data sheet
NEC	National Electrical Code
NESC	National Electrical Safety Code
NIOSH	National Institute for Occupational Safety and Health
NRR	noise reduction rating
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon

PDI	Pre-Design Investigation
PEL	permissible exposure limit
PID	photoionization detector
PO	Project Officer
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride
RD Work Plan	*Remedial Design Work Plan*
RMSF	Rocky Mountain Spotted Fever
SPSA	safe performance self-assessment
SS	Site Supervisor
SSE	Short Service Employee
SZ	support zone
Ta adj	adjusted air temperature
TLV	Threshold Limit Value
UFPO	Underground Facility Protection Organization
UL	Underwriters Laboratory
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

PREFACE

Any field sampling activities and/or intrusive work conducted within the Park Street Former MGP Site located in Geneseo, New York that will potentially encounter or disturb remaining MGP residuals, including any modifications or repairs to the existing monitoring wells or ground surface cover that may disturb MGP-related residuals, will be performed in compliance with a Contractor-prepared task-specific HASP.

The Contractor shall be responsible for preparing a site-specific HASP in compliance with DER-10 and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local rules and regulations. All field work must be performed in accordance with applicable federal, state, and local rules and regulations to protect worker health and safety. The Contractor's HASP will cover all personnel who will be employed by the Contractor to perform the work at the site, including direct employees, as well as Subcontractors. If the Contractor does not wish to include Subcontractors under their HASP, the Subcontractor will be responsible for developing and implementing a HASP that meets all applicable requirements. The Contractor will submit the task-specific HASP to the New York State Department of Environmental Conservation (NYSDEC) for review prior to initiating field activities. The site-specific HASPs will include information on site activities anticipated to be conducted. The Contractor shall be solely responsible for the health and safety of their own employees, subcontractors, agents and invitees, the public, and protection of property.

This Generic Health and Safety Plan (GHASP) presents a general guideline for Contractors preparing the task-specific HASP; however, current site conditions must be considered, and specific site activities defined and evaluated. **Inclusion of this GHASP is for illustrative purposes only; this GHASP may not be used as a substitute for a Contractor-prepared HASP.** All Contractor employees who may come into contact with potentially impacted environmental media will follow the Contractor's site-specific HASP detailing the procedures that will be utilized to comply with applicable regulations. The Contractor has the sole responsibility for confirming that the worksite is safe, neat, and maintained in an orderly condition, and is free from hazards, and work tasks are performed in a safe manner. The Contractor is also solely responsible by law for compliance and regulatory reporting requirements for all workplace and employee safety issues.

Any use or adaptation of any portion of this GHASP by a Contractor will be at the sole risk of the Contractor.

1 INTRODUCTION

1.1 Objective

As described in the Preface, this GHASP has been prepared to serve as a general guidance example document to establish baseline safety activities for Contractors preparing task-specific HASPs prior to performing intrusive work and/or site monitoring and maintenance activities specified in the Site Management Plan (SMP) for the Park Street former MGP site. Inclusion of this GHASP is for illustrative purposes only; this GHASP may not be used as a substitute for a Contractor-prepared HASP. The Contractor performing the work must evaluate specific hazard control methodologies based on the tasks to be performed to minimize the potential of accident or injury. The objective of the Contractor's HASP will be to provide a mechanism for establishing safe working conditions at the site. Specific hazard control methodologies need to be evaluated and selected to minimize the potential for injury, illness, exposure, or other hazardous incident.

1.2 Site and Facility Description

The Park Street former MGP site is located at 4 and 6 Park Street in the Village of Geneseo, Livingston County, New York. The former gas works operations covered approximately ¾ of an acre that was located on what is now the eastern side of the State University of New York (SUNY) Geneseo campus.

The site property, which is owned by SUNY, is bound on the north by commercial buildings and School Street; on the west by a SUNY academic building complex (the Brodie Fine Arts building), by Park Street on the south; and on the east by a SUNY parking lot and commercial buildings along the west side of Main Street. The Park Street site straddles the boundary between the village commercial district and the SUNY campus. Most of the area occupied by the former MGP is either paved or located under buildings. The eastern portion of the site is a paved parking lot (L-Lot), and the western portion is covered by a campus access road, buildings, and small landscaped area. Based on correlation between current campus maps and historical Sanborn Fire Insurance (Sanborn) maps, the east side of the former gas production building was located under the parking lot and access road, and the west side of the gas house and the gas holder was under the east end of the Brodie Fine Arts building.

1.3 Definitions

The following definitions are applicable to this HASP:

- Site – The area where the work is to be performed.
- Project – All on-site work performed under the scope of work.
- Contractor/Subcontractor – Includes contractor personnel hired by RG&E and/or RG&E's Contractor.
- On-Site Personnel – All NYSEG personnel or subcontractor personnel involved with the project.
- Visitor – All other personnel, except the on-site personnel. All visitors must receive approval to enter the site

- Exclusion Zone (EZ) – Any portion of the site where hazardous substances are, or are reasonably suspected to be present in the air, water, or soil.
- Contamination Reduction Zone (CRZ) – Area between the EZ and SZ that provides a transition between contaminated and clean areas. Decontamination stations are located in this zone.
- Support Zone (SZ) – All areas of the site, excluding the EZ and CRZ. The SZ surrounds the immediate area where project activities are under way. Support equipment is located in this zone.
- Work Area – the portion of the site where work areas are actively being performed; this area may change daily as work progresses. The site includes the Exclusion Zone (EZ), Contamination Reduction Zone (CRZ), and Support Zone (SZ)
- Incident - All losses, including first-aid cases, injuries, illnesses, near-misses, spills/leaks, equipment and property damage, motor vehicle accidents, regulatory violations, fires, and business interruptions

2 ROLES AND RESPONSIBILITIES

2.1 All Personnel

All personnel must adhere to the procedures outlined in the Contractor's HASP during the performance of their work at the site. Each person is responsible for completing tasks safely and reporting any unsafe acts or conditions to their supervisor. No person may work in a manner conflicting with those procedures. After due warnings, the Contractor's Project Manager will dismiss from the site any person who violates safety procedures.

All personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in the Contractor's HASP prior to initiating site activities. In addition, all personnel will attend an initial hazard briefing prior to beginning work at the site.

2.2 Personnel Descriptions

2.2.1 Health and Safety Officer

The Health and Safety Officer (HSO) or his/her designee (e.g., the Health and Safety Manager) has overall responsibility for the technical health and safety aspects of the project, including review and approval of the HASP. Inquiries regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The HSO or his/her designee must approve changes or addenda to this HASP.

2.2.2 Project Manager

The Project Manager (PM) is responsible for verifying that project activities are completed in accordance with the requirements of this HASP. The Project Manager is responsible for confirming that the Site Supervisor (SS) has the equipment, materials, and qualified personnel to fully implement the safety requirements of this HASP. It is also the responsibility of the Project Manager to perform the following duties:

- Consult with the HSO on site health and safety issues
- Verify that subcontractors meet health and safety requirements prior to commencing work
- Verify that incidents are thoroughly investigated and reported to the RG&E Project Manager within 24 hours of notification
- Approve, in writing, addenda or modifications to this HASP
- Suspend work or modify work practices, as necessary, for personal safety, protection of property, and regulatory compliance

2.2.3 Health and Safety Supervisor

The Contractor's Health and Safety Supervisor (HSS) is responsible for field health and safety issues, including the execution of this HASP. Questions in the field regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The HSS will advise the PM on health and safety issues, and will establish and coordinate the project air monitoring program if one is deemed necessary (see Section 6.1 – Air and Noise Monitoring). The HSS is the primary site contact on health and safety matters. It is the responsibility of the HSS to perform the following duties:

- Provide on-site technical assistance, if necessary
- Participate in all incident investigations and confirm that they are reported to the HSO, PM, and client within 24 hours
- Coordinate site and personal air monitoring, as required, including equipment maintenance and calibration
- Conduct site safety orientation training and safety meetings
- Verify that site personnel have received the required physical examinations and medical certifications
- Review site activities with respect to compliance with this HASP
- Maintain required health and safety documents and records
- Assist the SS with instructing field personnel on project hazards and protective procedures

2.2.4 Site Supervisor

The Site Supervisor (SS) is responsible for implementing the HASP, including communicating requirements to on-site personnel. The SS will be responsible for informing the PM of changes in the work plan, procedures, or site conditions so that those changes may be addressed in this HASP. Other responsibilities are to perform the following duties:

- Consult with the HSS on site health and safety issues
- Stop work, as necessary, for personal safety, protection of property, and regulatory compliance
- Obtain a site map, determine and post routes to medical facilities, and post emergency telephone numbers
- Notify local public emergency representatives (as appropriate) of the nature of the site operations, and post their telephone contact numbers
- Observe on-site project personnel for signs of ill-health effects
- Investigate and report any incidents to the HSS/PM and RG&E
- Verify that all on-site personnel have completed applicable training

- Verify that on-site personnel are informed of the physical, chemical, and/or biological hazards associated with the site activities and the procedures and protective equipment necessary to control the hazards
- Perform and/or oversee real-time breathing zone air monitoring and monitoring under the Community Air Monitoring Plan (CAMP)

2.3 Subcontractors

Subcontractors and their personnel must understand and comply with applicable regulations and site requirements established in the Contractors task-specific HASP. Subcontractors may prepare their own site-specific HASP that must be compliant with regulatory requirements.

All subcontractor personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this GHASP prior to initiating site activities. All subcontractor personnel will attend an initial hazard briefing prior to beginning work at the site. Additionally, on-site subcontractor personnel must attend and participate in the documented daily safety meetings.

Subcontractors must designate individuals to function as the PM, HSO, HSS, and SS. A subcontractor may designate the same person to perform the duties of both the HSS and the SS. However, depending on the level of complexity of a contractor's scope of work, it may be infeasible for one person to perform both functions satisfactorily.

2.4 All On-Site Personnel

All on-site personnel must read and acknowledge their understanding of this HASP before commencing work and abide by the requirements of the HASP. On-site personnel must sign a HASP Acknowledgement Form after reviewing this HASP; and example is provided as **Attachment A**.

All personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in the Contractor's HASP prior to initiating site activities. In addition, all on-site personnel will attend an initial hazard briefing (prior to beginning work at the site) and the daily safety meetings.

On-site personnel will immediately report the following to the SS/HSS and RG&E:

- personal injuries and illnesses, no matter how minor
- unexpected or uncontrolled release of chemical substances
- symptoms of chemical exposure
- unsafe or hazardous situations
- unsafe or malfunctioning equipment
- changes in site conditions that may affect the health and safety of project personnel
- damage to equipment or property

- situations or activities for which they are not properly trained
- near misses

2.5 Visitors

All visitors to work areas must check in with the SS. Visitors will be cautioned to avoid contact with any materials that may be, or are suspected to be, impacted by constituents of concern (COCs).

Visitors requesting to observe work at the site must don appropriate personal protective equipment (PPE) prior to entering the work area and must have the appropriate training and medical clearances to do so. If respiratory protective devices are necessary, visitors who wish to enter the work area must have been respirator-trained and fit tested for a respirator within the past 12 months. Visitors will be escorted at all times while on site.

2.6 Stop Work Authority

Every employee at the site has the responsibility to stop the work of another co-worker if the working conditions or behaviors are considered unsafe.

3 PROJECT HAZARDS AND CONTROL MEASURES

3.1 Scope of Work

Field activities identified in the FSP are expected to include the following general tasks:

- mobilization
- groundwater gauging, sampling, and monitoring
- decontamination
- demobilization

The following field activities may be required during the project; therefore, are also included in this GHASP:

- installation of soil borings and groundwater monitoring wells/piezometers
- sub-surface soil sampling

3.2 Field Activities, Hazards, and Control Procedures

The Contractor must prepare Job Safety Analyses (JSAs) relevant to the work tasks to be completed. Example JSAs are provided in **Attachment B**, and the text below both identify examples of potential health, safety, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the site to identify hazards that may affect on-site personnel, the community, or the environment. The SS must be aware of these changing conditions and discuss them with the Project Manager whenever these changes impact employee health, safety, the environment, or performance of the project. The SS will keep on-site personnel informed of the changing conditions, and the Project Manager will write and/or approve addenda or revisions to this HASP, as necessary.

High voltage electrical sources represent the primary safety hazards that exist for all site activities. Safety hazards associated with high voltage electrical sources include contact with overhead and underground conductors (e.g., conduits, cables, wires), the possibility of arcs and subsequent fire or explosion, and loud noises associated with automatic switching equipment. No work activities should be conducted in the vicinity of high voltage electrical sources without the direct supervision of an RG&E qualified employee.

The following sections contain generic summaries of several potential hazards and control measures for site activities.

3.2.1 Field Mobilization

Site mobilization, and survey if required, will include determining the location of utilities and other installations and establishing work areas. Mobilization may also include setting up equipment and establishing a temporary site office/work area. Break areas will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel

should walk the site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this GHASP.

Hazards - Potential hazards may be associated with heavy equipment operation (moving onto and around the site), manual materials handling, installation of temporary on-site facilities (e.g., decontamination pads), and site preparation. Manual materials handling and manual site preparation may cause blisters; sore muscles; and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Installation of a temporary field office and support facilities may expose personnel to electrical hazards, underground and overhead utilities, and physical injury due to the manual lifting and moving of materials. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards may include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat- or cold-related illnesses; and pathogens, such as rabies, and Lyme disease.

Controls - General control procedures for these types of hazards are discussed in Section 4 – General Safety Practices.

3.2.2 Drilling Hazards

This example task includes installation of groundwater monitoring wells and soil borings. The primary physical hazards for this activity are associated with the use of drilling equipment. Rig accidents can occur as a result of improperly placing the rig on uneven or unstable terrain or failing to adequately secure the rig prior to the start of operations. Underground and overhead utility lines can create hazardous conditions if contacted by drilling equipment. Tools and equipment, such as elevators, cat lines, and wire rope, have the potential for striking, pinning, or cutting personnel.

Wire Rope – Worn or frayed wire rope presents a laceration hazard if loose wires protrude from the main bundle.

Cat Lines – Cat lines are used on drilling rigs to hoist material. Accidents that occur during cat line operations may injure the employee doing the rigging, as well as injure the operator. Minimal hoisting control causes sudden and erratic load movements, which may result in hand and foot injuries.

Working Surfaces – Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, and slips and falls.

Materials Handling – The most common type of accident that occurs in materials handling operations is the “caught between” situation when a load is being handled and a finger or toe gets caught between two objects. Rolling stock can shift and/or fall from a pipe rack or truck bed.

3.2.2.1 Drilling Safety Procedures

Drill Crews – All drillers must possess required state or local licenses to perform such work. All members of the drill crew shall receive site-specific training prior to beginning work.

The driller is responsible for the safe operation of the drill rig, as well as the crew's adherence to the requirements of this GHASP. The driller must confirm that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions of the driller, wear all PPE, and be aware of all hazards and control procedures. The drill crews must participate in the daily safety meetings and be aware of all emergency procedures.

Rig Inspection – Each day, prior to the start of work, the drill rig and associated equipment must be inspected by the driller and/or drill crew. Inspections must be documented. The following items must be inspected:

- vehicle condition
- proper storage of equipment
- condition of all wire rope and hydraulic lines
- condition of all drill rods and internal threads
- fire extinguisher
- first-aid kit

Drill Rig Set Up – The drill rig must be properly blocked and leveled prior to raising the derrick. The wheels that remain on the ground must be chocked. The leveling jacks shall not be raised until the derrick is lowered. The rig shall be moved only after the derrick has been lowered.

Site Drilling Rules – Before drilling activities commence, the existence and location of underground pipe, electrical equipment, and gas lines shall be determined. Underground Facilities Protection Organization (UFPO) must be contacted at least 3 days, but no more than 2 weeks prior to subsurface activities. The Contractor's SS will meet with electrical and natural gas locators on Site prior to marking out the underground utilities. During this meeting, the SS will provide the electric and natural gas locators with a site figure that shows the locations where drilling activities will be completed. The SS will conduct a Site walkover with the electrical and natural gas locators to visually identify each location where drilling activities are to be completed during site operations. A Subsurface Utility Checklist and its associated Underground Utility Procedure shall be used to document that nearby utilities have been marked on the ground and that the drilling areas have been cleared. An example checklist is included as **Attachment C.** The completed Subsurface Utility Checklist will be in the possession of the SS prior to commencement of any intrusive investigation.

Combustible gas readings of the general work area will be made regularly (see Section 6 – Air Monitoring).

Operations must be suspended and corrective action taken if the airborne flammable concentration reaches 10 percent of lower explosive limit (LEL) in the immediate area (a 1 foot radius) of the point of drilling or near any other ignition sources.

Under no circumstances will personnel be permitted to ride the traveling block or elevators nor will the cat line be used as a personnel carrier.

Overhead Electrical Clearances – If drilling is conducted in the vicinity of overhead power lines, the power to the lines must be shut off or the equipment must be positioned and blocked such that no part, including cables, can come within the minimum clearances as follows:

Table 3-1. Overhead Electrical Clearances*

Nominal System Voltage	Minimum Required Clearance
0 to 50 kV	10 feet
51 to 100 kV	12 feet
101 to 200 kV	15 feet
201 to 300 kV	20 feet
301 to 500 kV	25 feet
501 to 750 kV	35 feet
751 to 1,000 kV	45 feet

kV – kilovolts

- clearances to be confirmed by Contractor

When the drill rig is in transit, with the boom lowered and no load, the equipment clearance must be at least 4 feet for voltages less than 50 kV, 10 feet for voltages of 51 kV to 345 kV, and 16 feet for voltages above 345 kV.

Rig Set Up – All well sites will be inspected by the driller prior to the location of the rig to verify that a stable surface exists. This is especially important in areas where soft, unstable terrain is common.

All rigs will be properly blocked and leveled prior to raising the derrick. Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking confirms that differential settling of the rig does not occur.

When the ground surface is soft or otherwise unstable, wooden blocks, at least 24 inches by 24 inches and 4 inches to 8 inches thick, shall be placed between the jack swivels and the ground. The emergency brake shall be engaged and the wheels that are on the ground shall be chocked.

Hoisting Operations – Drillers should never engage the rotary clutch without watching the rotary table and determining that it is clear of personnel and equipment.

Unless the drawworks is equipped with an automatic feed control, the brake should not be left unattended without first being tied down.

Auger strings or casing should be picked up slowly.

During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor; no one else should be on the rig or derrick.

The brakes on the drawworks of the drill rig should be tested by the driller each day. The brakes should be thoroughly inspected by a competent individual each week.

A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.

Workers should never stand near the borehole whenever any wire line device is being run.

Hoisting control stations should be kept clean and controls labeled as to their functions.

Cat Line Operations – Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the cat line. The cathead area must be kept free of obstructions and entanglements.

The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Personnel should not stand near, step over, or go under a cable or cat line that is under tension.

Employees rigging loads on cat lines shall:

- Keep out from under the load.
- Keep fingers and feet where they will not be crushed.
- Be sure to signal clearly when the load is being picked up.
- Use standard visual signals only and not depend on shouting to co-workers.
- Make sure the load is properly rigged, since a sudden jerk in the cat line will shift or drop the load.

Wire Rope – When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope shall be removed from service or resocketed. Special attention shall be given to the inspection of end fittings on boom support, pendants, and guy ropes.

Wire rope removed from service due to defects shall be cut up or plainly marked as being unfit for further use as rigging.

Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope; the clip nuts shall be retightened immediately after initial load carrying use and at frequent intervals thereafter.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip; the clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, shall consist of one continuous piece without knot or splice.

An eye splice made in any wire rope shall have not less than five full tucks.

Wire rope shall not be secured by knots. Wire rope clips shall not be used to splice rope.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire clips or knots.

Auger Handling – Auger sections shall be transported by cart or carried by two persons. Individuals should not carry auger sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of rolling stock.

When equipment is being hoisted, personnel should not stand where the bottom end of the equipment could whip and strike them.

Augers stored in racks, catwalks, or on flatbed trucks should be secured to prevent rolling.

3.2.3 Soil Sampling

This task consists of collecting soil samples for subsequent analysis and evaluation of either potential impact by COCs or for geotechnical parameters. The physical hazards of these operations are primarily associated with the sample collection methods and procedures utilized. COCs consist of MGP-related benzene, toluene, ethylbenzene, and xylene (collectively referred to as BTEX) and polycyclic aromatic hydrocarbons (PAHs).

Hazards – Inhalation and absorption (contact) of COCs are the primary routes of entry associated with soil sampling due to the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. During the course of this project, several different soil sampling methodologies may be utilized based on equipment accessibility and the types of materials to be sampled. These sampling methods may include the use of hand-auger/sampling probes, sampling spoons, or trowels. The primary hazards associated with these specific sampling procedures are not potentially serious; however, other operations in the area or the conditions under which samples must be collected may present chemical and physical hazards. The hazards directly associated with soil sampling procedures are generally limited to strains/sprains and potential eye hazards. Exposure to soil and water containing COCs is also possible. In addition to the safety hazards specific to sampling operations, hazards associated with the operation of vehicles, especially large vehicles with limited operator visibility, is a concern. Of particular concern will be the backing up of trucks, excavation equipment, and other support vehicles.

The flora and fauna of the site may present hazards of poison ivy, poison oak, ticks, fleas, mosquitoes, wasps, spiders, and snakes. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Freezing-weather hazards include frozen, slick, and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil.

Control – To control dermal exposure during soil sampling activities, a minimum of Modified Level D protection will be worn. Air monitoring may be conducted during soil sampling activities to assess the potential for exposure to airborne COCs. Subsurface soil samples will be collected and screened for volatile organic compounds (VOCs) using a photoionization detector (PID). If the results of air monitoring indicate the presence of organic vapors in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 6 – Air Monitoring for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 5 – Personal Protective Equipment. Personnel will collect samples remotely from outside of excavations when feasible. Control procedures for environmental and general hazards are discussed in Section 4 – General Safety Practices.

3.2.4 Water-Level Measurement Activities

At monitoring well locations, field personnel may obtain depth-to-water measurements using an electronic water-level indicator. The hazards associated with these activities are primarily associated with the working surfaces and contact with the groundwater.

The work area may present slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, and slick walking surfaces and unstable soil. For water-level measurement, Modified Level D protection can be used for dermal protection, unless, based upon air monitoring and conditions during site activities, the HSS determines that a higher or lower protection level is necessary. Air sampling will be conducted to assess the potential for inhalation of potential contaminants. If the results of air monitoring indicate COCs in a concentration causing concern, based on Section 6 –Air Monitoring, personnel will upgrade to Level C protection. Refer to Section 6 for a description of requirements and action levels. A description of each level of PPE protection is included in Section 5 – Personal Protective Equipment.

3.2.5 Groundwater Sampling/Monitoring

Groundwater sampling/monitoring involves uncapping, purging (pumping water out of the well), and sampling/monitoring new and existing monitoring wells. A mechanical pump may be utilized to purge the wells and can be hand-, gas-, or electric-operated. Water samples taken from the wells are then placed in containers and shipped to an analytical laboratory for analysis. The physical hazards of these operations are primarily associated with the sample collection methods and procedures utilized.

Hazards – Inhalation and absorption (contact) of COCs are the primary routes of entry associated with groundwater sampling due to the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. During the course of this project, several different groundwater sampling methodologies may be utilized based on equipment accessibility and the types of materials to be sampled. These sampling methods may include hand or mechanical bailing. The primary hazards associated with these specific sampling procedures are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards directly associated with groundwater sampling procedures are generally limited to strains/sprains from hand bailing and potential eye hazards. Exposure to soil and water containing COCs is also possible.

The flora and fauna of the site may present hazards of poison ivy, poison oak, ticks, fleas, mosquitoes, wasps, spiders, and snakes. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Freezing-weather hazards include frozen, slick, and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil.

Control – To control dermal exposure during groundwater sampling/monitoring activities, a minimum of Modified Level D protection will be worn. Air monitoring will be conducted during groundwater sampling/monitoring activities to assess the potential for exposure to airborne COCs. If the results of air monitoring indicate the presence of organic vapors in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 6 – Air Monitoring for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 5

– Personal Protective Equipment. Control procedures for environmental and general hazards are discussed in Section 4 – General Safety Procedures.

3.2.6 Demobilization

Demobilization involves the removal of all tools, equipment, supplies, and vehicles brought to the site. The hazards of this phase of activity are associated with heavy equipment operation and manual materials handling.

Hazards – Manual materials handling may cause blisters, sore muscles, and joint and skeletal injuries and may present eye, contusion, and laceration hazards. Heavy equipment operation presents noise and vibration hazards and hot surfaces to operators. Personnel in the vicinity of heavy equipment operation may be exposed to physical hazards resulting in fractures, contusions, and lacerations and may be exposed to high noise levels. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat- or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Controls – Control procedures for these hazards are discussed in Section 4 – General Safety Practices.

3.3 Chemical Hazards

The potential chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to soil and groundwater impacted with a number of constituents, primarily the following COCs: MGP-related BTEX and PAHs.

Airborne concentrations of COCs may be measurable during certain intrusive activities and will require monitoring during those activities. Air monitoring requirements for site tasks are outlined in Section 6.

Example Safety Data Sheets (SDSs) for the COCs are included in **Attachment D**.

4 GENERAL SAFETY PRACTICES

4.1 General Safety Rules

General safety rules for site activities include, but are not limited to, the following:

- At least one copy of the Contractor's HASP must be in a location at the site that is readily available to personnel, and all project personnel shall review this HASP prior to starting work.
- Consume or use food, beverages, chewing gum, and tobacco products only in the SZ or other designated area outside the EZ and CRZ. Cosmetics shall not be applied in the EZ or CRZ.
- Wash hands before eating, drinking, smoking, or using toilet facilities.
- Wear all PPE, as required, and stop work and replace damaged PPE immediately.
- Secure disposable coveralls, boots, and gloves at the wrists and legs and confirm closure of the suit around the neck.
- Upon skin contact with materials that may be impacted by COCs, remove contaminated clothing and wash the affected area immediately. Contaminated clothing must be changed. Any skin contact with materials potentially impacted by COCs must be reported to the SS or HSS immediately. If needed, medical attention should be sought.
- Practice contamination avoidance. Avoid contact with surfaces either suspected or known to be impacted by COCs, such as standing water, mud, or discolored soil. Equipment must be stored on elevated or protected surfaces to reduce the potential for incidental contamination.
- Remove PPE, as required, in the CRZ to limit the spread of COC-containing materials.
- At the end of each shift or as required, dispose of all single-use coveralls, soiled gloves, and respirator cartridges in designated receptacles designated for this purpose.
- Removing soil containing site COCs from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited.
- Inspect all non-disposable PPE for contamination in the CRZ. Any PPE found to be contaminated must be decontaminated or disposed of appropriately.
- Recognize emergency signals used for evacuation, injury, and fire.
- Report all injuries, illnesses, near misses, and unsafe conditions or work practices to the SS or HSS.
- Use the "buddy system" during all operations requiring Level C PPE, and when appropriate, during Modified Level D operations.
- Obey all warning signs, tags, and barriers. Do not remove any warnings unless authorized to do so.
- Use, adjust, alter, and repair equipment only if trained and authorized to do so and in accordance with the manufacturer's directions.

- Personnel are to perform only tasks for which they have been properly trained and will advise their supervisor if they have been assigned a task for which they are not trained.
- The presence or consumption of alcoholic beverages or illicit drugs during the workday is strictly prohibited. Notify your supervisor if you must take prescription or over-the-counter drugs that could cause drowsiness or other side effects that could impair judgment.
- Remain upwind during site activities whenever possible.

4.2 Loss Prevention Observation

The SS or the HSS will perform a loss prevention observation (LPO) to identify and correct potential hazards and to positively reinforce behaviors and practices that are correct. The SS or HSS must identify potential deviations from safe work practices that could possibly result in an incident and take prompt corrective action. The LPO process includes the following steps:

- Identify tasks that have the greatest potential for hazardous incidents.
- Be familiar with the proper procedure for completing the task.
- Discuss with the observed employee the task and the SS/HSS role in observing the task.
- Observe the employee completing the task.
- Document positive conditions and actions and identify areas in need of improvement.

Example LPO forms are located at **Attachment E**.

4.2.1 Incident Investigation

An incident is any of the following events: first-aid cases, injuries, illnesses, near misses, spills/leaks, equipment and property damage, motor vehicle accidents, regulatory violations, fires, and business interruptions. All incidents should be investigated within 24 hours and reported to the PM, HSO, and client.

The purpose of an incident investigation is to prevent the recurrence of a similar hazardous event. Incident investigations investigate all incidents in the same manner. Using the information gathered during an investigation, appropriate measures will be taken to protect personnel from the hazard in question. An example Incident Investigation Form is included in **Attachment F**.

4.2.2 Job Safety Analysis

JSA is a tool used to identify potential hazards, and to develop corrective or protective systems to eliminate the hazard. A JSA lists all potential hazards associated with an activity. Hazards may be physical (such as lifting hazards or eye hazards) or environmental (such as weather). After identifying the hazards associated with an activity, control measures are evaluated and protective measures or procedures are then instituted. JSAs should be reviewed periodically so that the procedures and protective equipment specified for each activity are current and technically correct. Any changes in site conditions and/or scope of work may require review of and modification to the JSA in question. During

this review process, comments on the JSA and its procedures should be obtained from personnel associated with the activity being analyzed.

4.3 Buddy System

On-site personnel should use the buddy system, as required by operations. Use of the "buddy system" should be required during all operations requiring Level C to Level A PPE, and when appropriate, during Level D/Modified D operations. Crew members must observe each other for signs of chemical exposure, and heat or cold stress. Indications of adverse effects include, but are not limited to:

- changes in complexion and skin coloration
- changes in coordination
- changes in demeanor
- excessive salivation and pupillary response
- changes in speech pattern

Crew members must also be aware of the potential exposure to possible safety hazards, unsafe acts, or non-compliance with safety procedures.

Field personnel must inform their partners or fellow crewmembers of non-visible effects of exposure to toxic materials that they may be experiencing. The symptoms of such exposure may include, but are not limited to:

- headaches
- dizziness
- nausea
- blurred vision
- cramps
- iritation of eyes, skin, or respiratory tract

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

4.4 Heat Stress

Heat stress is caused by a number of interacting factors, including, but not limited to, environmental conditions, clothing, and workload, as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat rashes are one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much or too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3 percent sodium chloride), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat exhaustion occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat stroke is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors and its occurrence is difficult to predict.

Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature (e.g., a rectal temperature of 41 degrees Celsius [°C] [105.8 degrees Fahrenheit {°F}]). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the

condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first-aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

Heat Stress Safety Precautions

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in Table 4-1.

Table 4-1. Work/Rest Schedule

Adjusted Temperature	Work/Rest Regimen Normal Work Ensemble[b]	Work/Rest Regimen Impermeable Ensemble
90ºF (32.2ºC) or above	After each 45 minutes of work	After each 15 minutes of work
87.5º - 90ºF (30.8º-32.2ºC)	After each 60 minutes of work	After each 30 minutes of work
82.5º - 87.5ºF (28.1º - 30.8ºC)	After each 90 minutes of work	After each 60 minutes of work
77.5º - 82.5ºF (25.3º - 28.1ºC)	After each 120 minutes of work	After each 90 minutes of work
72.5º - 77.5ºF (30.8º - 32.2ºC)	After each 150 minutes of work	After each 120 minutes of work

a. For work levels of 250 kilocalories per hour (Light-Moderate Type of Work).

b. Calculate the adjusted air temperature (ta adj) by using this equation: ta adj oF = ta oF + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

c. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

d. The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

To determine if the work rest cycles are adequate for the personnel and specific site conditions, additional monitoring of individual heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.

Additionally, one or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-site drinking water will be kept cool (50 to 60°F).
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Employees must not be assigned to other tasks during breaks.
- Employees must remove impermeable garments during rest periods. This includes white Tyvek™-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

4.5 Cold Stress

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body that have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at 18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in **Table 4-2.**

Table 4-2. Chill Temperature Chart

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

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH TLVs for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- Frost Nip or Incipient Frostbite – characterized by sudden blanching or whitening of skin.
- Superficial Frostbite – skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- Deep Frostbite – tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first-aid treatment. To avoid cold stress, site personnel must wear protective clothing appropriate for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

Cold Stress Safety Prevention

For air temperatures of 0°F or less, mittens should be used to protect the hands. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.

At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.

If work is done at a normal temperature or in a hot environment before entering the cold, the field personnel must confirm that their clothing is not wet as a consequence of sweating. Field personnel must change into dry clothes prior to entering the cold area.

If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.

Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

Safe Work Practices

Direct contact between bare skin and cold surfaces (less than 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.

Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing.

Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

4.6 Biological Hazards

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, scorpions, and other pests.

4.6.1 Tick Borne Diseases

Lyme disease – The disease commonly occurs in summer and is transmitted by the bite of infected ticks. “Hot spots” in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull’s eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, and swelling and pain in the joints, and eventually, arthritis.

Erlichiosis – The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. Historical “hot spots” in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms,

but there is typically no skin rash. These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Rocky Mountain Spotted Fever (RMSF) – This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for 2 to 3 weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death if untreated, but if identified and treated promptly, death is uncommon.

Control – Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every 3 or 4 hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

4.6.2 Poisonous Plants

Poisonous plants may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

Control – The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water and observed for signs of reddening.

4.6.3 Snakes

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snakebites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control – To minimize the threat of snakebites, all personnel walking through vegetated areas must be aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as, but not limited to, turning over logs. If a snakebite occurs, an attempt should be made to obtain snake markings, size, and color for identification. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

4.6.4 Spiders

Personnel may encounter spiders during work activities.

Two spiders are of concern, the black widow and the brown recluse. Both prefer dark sheltered areas, such as basements, equipment sheds and enclosures, and around woodpiles or other scattered debris. The black widow is shiny black, approximately 1-inch-long, and found throughout the United States. There is a distinctive red hourglass marking on the underside of the black widow's body. The bite of a black widow is seldom fatal to healthy adults, but effects include respiratory distress, nausea, vomiting, and muscle spasms. The brown recluse is smaller than the black widow and gets its name from its brown coloring and behavior. The brown recluse is more prevalent in the southern United States. The brown recluse has a distinctive violin shape on the top of its body. The bite of the brown recluse is painful and the bite site ulcerates and takes many weeks to heal completely.

Control – To minimize the threat of spider bites, all personnel walking through vegetated areas must be aware of the potential for encountering these arachnids. Personnel need to avoid actions that may result in encounters, such as turning over logs, and placing hands in dark places, such as behind equipment or in corners of equipment sheds or enclosures. If a spider bite occurs, the victim must be transported to the nearest hospital as soon as possible; first aid consists of applying ice packs and washing the area around the wound to remove any unabsorbed venom.

4.6.5 Mosquitoes

Personnel may be exposed to mosquitoes during work activities.

Typical exposure to mosquitoes does not present a significant hazard. However, if West Nile virus is prevalent in the area, exposure to this virus is increased. West Nile virus results in flu-like symptoms and can be serious if not treated or in immune-compromised individuals.

Control – To minimize the threat of mosquito bites, all personnel working outside must be aware of the potential for encountering mosquitoes and implement the basic precautions listed below:

- Avoid working at dawn or dusk when mosquitoes are most active.
- Prevent accumulation of standing water at the work-site.
- Apply an insect repellent that contains DEET to exposed skin.
- Wear light colored clothes, preferably with long-sleeves and full-length pants.
- Do not touch any dead birds or animals that you encounter.

If dead birds are detected near the site, report to the local County Health Department. If flu-like symptoms are present, contact your Doctor or the Health and Safety Officer for more information.

4.7 Noise

Exposure to noise over the Occupational Safety and Health Administration (OSHA) action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to

noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

Control – All personnel must wear hearing protection, with a noise reduction rating (NRR) of at least 20 when noise levels exceed 85 decibels (dBA). When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss.

Noise monitoring requirements are discussed in Section 6.2 – Noise Monitoring.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

4.8 Spill Control

All personnel must take every precaution to minimize the potential for spills during site operations. All on-site personnel shall immediately report any discharge, no matter how small, to the SS.

Spill control equipment and materials will be located on the site at locations that present the potential for discharge. All sorbent materials used for the cleanup of spills will be containerized and labeled appropriately. In the event of a spill, the SS will follow the provisions in Section 9 – Emergency Procedures to contain and control released materials and to prevent their spread to off-site areas.

4.9 Sanitation

Site sanitation will be maintained according to appropriate federal, state, and local requirements and the guidance provided below.

4.9.1 Break Area

Breaks must be taken in the SZ, away from the active work area after site personnel go through decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in any area other than the SZ.

4.9.2 Potable Water

The following rules apply to all field operations:

- An adequate supply of potable water will be provided at each project site. Potable water must be kept away from hazardous materials or media and contaminated clothing or equipment.
- Portable containers used to dispense drinking water must be capable of being tightly closed, and must be equipped with a tap dispenser. Water must not be consumed directly from the container (drinking from the tap is prohibited) nor may it be removed from the container by dipping.
- Containers used for drinking water must be clearly marked and shall not be used for any other purpose.

- Disposable drinking cups must be provided. A sanitary container for dispensing cups and a receptacle for disposing of used cups is required.

4.9.3 Sanitary Facilities

Access to facilities for washing before eating, drinking, or smoking, or alternate methods, such as waterless hand-cleaner, and paper towels will be provided.

4.9.4 Lavatory

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided.

This requirement does not apply to mobile crews or to normally unattended site locations so long as employees at these locations have transportation immediately available to nearby toilet facilities.

4.10 Emergency Equipment

Adequate emergency equipment for the activities being conducted on site and as required by applicable sections of 29 Code of Federal Regulation (CFR) 1910 and 29 CFR 1926 will be on site prior to the commencement of project activities. Personnel will be provided with access to emergency equipment, including, but not limited to, the following:

- fire extinguishers of adequate size, class, number, and location, as required by applicable sections of 29 CFR 1910 and 1926
- industrial first-aid kits of adequate size for the number of personnel on site
- emergency eyewash and/or shower, if required by operations being conducted on site

4.11 Lockout/Tagout Procedures

Only fully qualified and trained personnel will perform maintenance procedures. Before maintenance on any electrical equipment (if any) begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 will be followed.

Lockout is the placement of a device that uses a positive means, such as lock, to hold an energy- or material-isolating device such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system shall be used. Tagout is the placement of a warning tag on an energy- or material-isolating device indicating that the equipment controls may not be operated until the tag is removed by the personnel who attached the tag.

4.12 Electrical Safety

Electricity may pose a particular hazard to site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by Underwriters Laboratories (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.
- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or United States Coast Guard (USCG) regulations.
- Portable and semiportable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Tools protected by an approved system of double insulation or its equivalent, need not be grounded. Double-insulated tools must be distinctly marked and listed by UL or FM.
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- All circuits must be protected from overload.
- Temporary power lines, switchboxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension cord outlets must be equipped with ground fault circuit interrupters.
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.
- Extension cords or cables must be inspected prior to each use, and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

4.13 Lifting Safety

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.
- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.

- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees and the back is straight as the object is lowered.

4.14 Ladder Safety

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access, or when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

- Ladders shall be maintained free of oil, grease, and other slipping hazards.
- Ladders shall not be loaded beyond the maximum intended load for which they were built nor beyond their manufacturer's rated capacity.
- Ladders shall be used only for the purpose for which they were designed.
- Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
- Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
- Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces, including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- The area around the top and bottom of ladders shall be kept clear.

- The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
- Ladders shall not be moved, shifted, or extended while occupied.
- Ladders shall have non-conductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment.
- The top, top step, or the step labeled that it or any step above it should not be used as a step.
- Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- Ladders shall be inspected by the HSO for visible defects on a daily basis and after any occurrence that could affect their safe use.
- Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; corroded components; or other faulty or defective components shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with “Do Not Use” or similar language, and shall be withdrawn from service.
- Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; or corroded components; shall be withdrawn from service.
- Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
- Single-rail ladders shall not be used.
- When ascending or descending a ladder, the user shall face the ladder.
- Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- An employee shall not carry any object or load that could cause the employee to lose balance and fall.

4.15 Traffic Safety

The project site is located adjacent to a public roadway/access road where exposure to vehicular traffic is likely. Traffic may be encountered as vehicles enter and exit the area. To minimize the likelihood of project personnel and activities being affected by traffic, the following procedures will be implemented.

If working in the road, cones must be placed along the shoulder of the roadway starting 100 feet from the work area to alert passing motorists to the presence of personnel and equipment. A “Slow” or “Men Working” sign must be placed at the first cone. Barricades with flashing lights should be placed between the roadway and the work area.

During activities along a roadway, equipment will be aligned parallel to the roadway to the extent feasible, facing into the oncoming traffic so as to place a barrier between the work crew and the oncoming traffic. All crewmembers must remain behind the equipment and the traffic barrier.

All site personnel who are potentially exposed to vehicular traffic must wear an outer layer of orange warning garments, such as vests, jackets, or shirts. If work is performed in hours of dusk or darkness, workers will be outfitted with reflective garments either orange, white (including silver-coated reflective coatings or elements that reflect white light), yellow, fluorescent red-orange, or fluorescent yellow-orange.

The flow of traffic into and out of the adjacent business must be assessed, and precautions taken to warn motorists of the presence of workers and equipment. Where possible, vehicles should be aligned to provide physical protection of people and equipment.

4.16 Department of Transportation Dangerous Good Shipping Requirements

Hazardous materials and dangerous goods are those materials that have one or more of the following characteristics: explosives, compressed and liquefied gases, flammable liquids and solids, oxidizing materials, and other substances that are poisonous, infectious, radioactive, or corrosive. It is the handling, loading, packing, or placing of hazardous materials (dangerous goods) in or from a container or vehicle at any facility for the purpose of transportation (including storing) in the course of transportation. This also includes the packing and transporting for air and ground shipment of laboratory analysis samples.

Regulations governing hazardous materials and dangerous goods exist to protect people, the environment, or property when these goods are being transported by road, rail, sea, or air. Given the increased emphasis of federal (i.e., Federal Aviation Administration and United States Department of Transportation, and the Transportation of Dangerous Goods Act) attention to the transport of hazard material-containing goods, it is imperative that all shipments are packaged and transported such that they adhere to all federal requirements, whether shipping via ground or air. Anyone shipping samples should receive training on the appropriate preparation and shipping protocols prior to shipping any material that is, or suspected to be, hazardous. Employees who ship by air must have taken an IATA training course.

5 PERSONAL PROTECTIVE EQUIPMENT

5.1 Levels of Protection

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the levels of COCs and the degree of physical hazard. This section presents examples of the various levels of protection and defines the conditions of use for each level. A summary of the levels is presented in Table 5-1 located at the end of this section. The Contractor's PM shall verify the levels of PPE required before each work task is initiated.

5.1.1 Level D Protection

The minimum level of protection that will be required of personnel at the site will be Level D, which will be worn when no dermal hazard exists and air monitoring indicates no inhalation hazard exists. The following equipment will be used:

- work clothing as prescribed by weather
- steel-toe work boots, meeting American National Standards Institute (ANSI) Z41
- safety glasses or goggles, meeting ANSI Z87
- hi-visibility vest
- hard hat, meeting ANSI Z89, when falling object hazards are present
- hearing protection (if noise levels exceed 85 dBA, then hearing protection with a United States Environmental Protection Agency [USEPA] NRR of at least 20 dBA must be used)

5.1.2 Modified Level D Protection

Modified Level D will be used when airborne contaminants are not present at levels of concern, but site activities present a potential for skin contact with contaminated materials. Modified Level D consists of:

- nitrile gloves worn over nitrile surgical gloves
- latex/polyvinyl chloride (PVC) overboots when contact with COC-impacted media is anticipated
- steel-toe work boots, meeting ANSI Z41
- safety glasses or goggles, meeting ANSI Z87
- hi-visibility vest
- face shield in addition to safety glasses or goggles when projectiles or splash hazards exist
- hard hat, meeting ANSI Z89 when falling object hazards are present
- hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used)

- Tyvek® suit (polyethylene coated Tyvek® suits for handling liquids) when body contact with COC-impacted media is anticipated.

Metatarsal protectors will be worn by those performing saw cutting and jack hammering activities. If possible, cut-resistant gloves will be used in combination with nitrile gloves for cutting activities.

5.1.3 Level C Protection

Level C protection will be required when the airborne concentration of COCs reaches one-half of the OSHA Permissible Exposure Limit (PEL) or ACGIH TLV. The following equipment are examples of Level C protection; the Contractor's HASP will verify and confirm Level C requirements:

- full-face, air-purifying respirator with combination organic vapor and HEPA cartridges
- polyethylene-coated Tyvek® suit, with ankles and cuffs taped to boots and gloves
- nitrile gloves worn over nitrile surgical gloves
- steel-toe work boots, meeting ANSI Z41
- chemical resistant boots with steel toes or latex/PVC overboots over steel toe boots
- hi-visibility vest
- hard hat, meeting ANSI Z89
- hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used)
- Metatarsal protectors will be worn by those performing saw cutting and jack hammering activities. If possible, cut-resistant gloves will be used in combination with nitrile gloves for cutting activities. Workers requiring a respirator will have medical clearance and fit-test documentation available on site.

5.2 Selection of Personal Protection Equipment

Equipment for personal protection will be selected based on the potential for contact, Site conditions, ambient air quality, and the judgment of supervising site personnel and health and safety professionals. The PPE used will be chosen to be effective against the COCs present on the site.

5.3 Site Respiratory Protection Program

Respiratory protection is an integral part of employee health and safety at the Site due to potentially hazardous concentrations of airborne COCs. The site respiratory protection program will consist of the following (as a minimum):

- All on-site personnel who may use respiratory protection will have an assigned respirator.

- All on-site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air-purifying respirator within the past 12 months.
- All on-site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the HSS, prior to commencement of site work.
- Only cleaned, maintained, National Institute for Occupational Safety and Health-approved respirators will be used.
- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn when a respirator is worn.
- All on-site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.
- Respirators will be inspected, and a negative pressure test performed prior to each use.
- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

5.4 Using Personal Protective Equipment

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory if Modified Level D or Level C PPE is used. All personnel entering the EZ must put on the required PPE in accordance with the requirements of this HASP. When leaving the EZ, PPE will be removed in accordance with the procedures listed, to minimize the spread of COCs.

5.4.1 Donning Procedures

Depending on the level of protection selected, specific donning and doffing procedures may be required by the Contractor's HASP. The examples of procedures presented in this section are mandatory if Modified Level D or Level C PPE is used. All personnel entering the EZ must put on the required PPE in accordance with the requirements of the HASP. When leaving the EZ, PPE will be removed in accordance with the procedures listed to minimize the spread of COIs. These procedures are mandatory only if Modified Level D or Level C PPE is used on the site:

- Remove bulky outerwear. Remove street clothes and store in clean location.
- Put on work clothes or coveralls.
- Put on the required chemical protective coveralls.
- Put on the required chemical protective boots or boot covers.
- Tape the legs of the coveralls to the boots with duct tape.

- Put on the required chemical protective gloves.
- Tape the wrists of the protective coveralls to the gloves.
- Don the required respirator and perform appropriate fit check (Level C).
- Put hood or head covering over head and respirator straps and tape hood to facepiece (Level C.
- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, the Contractor's HASP may require one person to remain outside the work area to confirm that each person entering has the proper protective equipment.

5.4.2 Doffing Procedures

The following example of procedures are only mandatory if Modified Level D or Level C PPE is required for the Site. Whenever a person leaves the work area, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots or remove contaminated boot covers.
- Clean reusable protective equipment.
- Remove protective garments, equipment, and respirator (Level C). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels.
- Wash hands, face, and neck (or shower if necessary).
- Proceed to clean area and dress in clean clothing.
- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags and labeled for disposal. See Section 7 – Work Zones and Decontamination for detailed information on decontamination stations.

5.5 Selection Matrix

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the SS and HSS of the potential for skin contact with COCs. An example PPE selection matrix is presented in Table 5-1. This matrix should be based on information available at the time the Contractor's HASP is written. The Airborne Contaminant Action Levels in Table 6-1 should be used to verify that the PPE prescribed in these matrices is appropriate.

Table 5-2. PPE Selection Matrix

Task	Anticipated Level of Protection for Task Initiation
Mobilization	Level D
Soil groundwater sampling	Modified Level D
Soil borings, monitoring well installation	Modified Level D/Level C
Soil vapor surveys	Level D
Decontamination	Level D/Modified Level D
Site demobilization	Level D

6 AIR AND NOISE MONITORING

6.1 Air Monitoring

The NYSDOH Generic CAMP requires that air monitoring will be conducted during all ground-intrusive activity to determine community and employee exposure based on the potential for generation of airborne constituents. The monitoring results will dictate work procedures and the selection of PPE. At a minimum, the monitoring devices to be used are a photoionization detector (PID) (or equivalent), and a particulate monitor. The Contractor's HSS will be responsible for utilizing the air monitoring results to determine appropriate health and safety precautions for Contractor personnel.

Air monitoring will be conducted continuously with the LEL/O_2/CO/H_2S meter if flammable/explosive vapors are suspected and during ground-intrusive activities. Continuous real-time monitoring for organic vapors for the purpose of estimating employee exposure level will be conducted in the breathing zone with the PID during all ground-intrusive activities. If a reading above 1 ppm in the work zone persists for more than 1 minute, the air monitoring and corrective actions outlined in Table 6-1 will be implemented. At a minimum, all readings will be manually recorded on an hourly basis on air monitoring logs (example log included in **Attachment G**) or field notebooks.

All work activity must stop where tests indicate the concentration of flammable vapors exceeds 10 percent of the LEL at a location with a potential ignition source. Such an area must be ventilated to reduce the concentration to an acceptable level.

6.2 Noise Monitoring

Noise monitoring may be conducted, as required by the Contractor's HASP. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

6.3 Monitoring Equipment Maintenance and Calibration

All direct-reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the HSS and maintained by the SS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturers' procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturers' procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the HSS must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The HSS will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

6.4 Action Levels

Table 6-1 presents airborne constituent action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site. The Contractor's HSP should verify these levels.

Table 6-3. Work Zone/Worker Breathing Zone Airborne Constituent Action Levels

Parameter	Reading in Breathing Zone	Action
Total Organic Vapors	0 ppm to < 0.5 ppm	Normal operations; record breathing zone monitoring measurements every hour
	> 0.5 ppm to 5 ppm	Increase recording frequency to at least every 15 minutes and use benzene detector tube to screen for the presence of benzene
	> 5 ppm to 50 ppm	Upgrade to level C PPE, continue screening for benzene
	> 50 ppm	Stop work; evacuate work area, investigate cause of reading, reduce through engineering controls, contact HSO
Benzene (as determined by colorimetric tube)	0.5 ppm to 10 ppm	Upgrade to Level C PPE
	> 10 ppm	Stop work; evacuate confined spaces/work area, investigate cause of reading; contact HSO
Airborne Particulates (During excavation activity)	0 to < 1 mg/m^3	Normal operations; continue hourly breathing-zone monitoring.
	$\geq$1 mg/m^3	Recommend initiation of dust-suppression measures.
Oxygen	< 19.5 %	Stop work; evacuate confined spaces/work area, investigate cause of reading; ventilate area; contact HSO
	> 19.5% to < 23.5 %	Normal operations

Parameter	Reading in Breathing Zone	Action
	> 23.5 %	Stop work; evacuate confined spaces/work area, investigate cause of reading; ventilate area; contact HSO
Carbon Monoxide	0 to 20 ppm	Normal operations
	> 20 ppm	Stop work; evacuate confined spaces/work area, investigate cause of reading; ventilate area; contact HSO
Hydrogen Sulfide	0 to 5 ppm	Normal operations
	> 5 ppm	Stop work; evacuate confined spaces/work area, investigate cause of reading; ventilate area; contact HSO
Flammable Vapors (LEL)	< 10% LEL	Normal operations
	≥ 10% LEL	Stop work; ventilate area; investigate source of vapors

7 WORK ZONES AND DECONTAMINATION

7.1 Work Zones

7.1.1 Authorization to Enter

All personnel who may be potentially exposed to hazardous substances must have completed hazardous waste operations initial training as defined under OSHA Regulation 29 CFR 1910.120, have completed their training or refresher training within the past 12 months, and have been certified by a physician as fit for hazardous waste operations to enter a site area designated as an EZ or CRZ. Personnel without such training or medical certification may enter the designated SZ only. The SS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed within the EZ or CRZ. In the event that it becomes necessary for NYSEG personnel to enter the area designated as the EZ or CRZ (e.g., due to an electrical emergency, control switching), reasonable efforts (e.g., relocating equipment, conducting continuous air monitoring) will be implemented to redesignate the area as a non-restricted access area. If NYSEG personnel are required to enter the EZ or CRZ, the SS will provide direct supervision and conduct continuous air monitoring while NYSEG personnel are within the EZ or CRZ.

7.1.2 Site Orientation and Hazard Briefing

No person will be allowed in the work area during site operations without first being given a Site orientation and hazard briefing. This orientation will be presented by the SS or HSS, and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. Following this initial meeting, daily safety meetings will be held each day before work begins.

All people entering the site work areas, including visitors, must document their attendance at this briefing, as well as the daily safety meetings on the forms included with this HASP.

7.1.3 Certification Documents

A training and medical file may be established for the project and kept on site during all Site operations. Specialty training, such as first-aid/cardiopulmonary resuscitation (CPR) certificates, as well as current medical clearances for all project field personnel required to wear respirators, will be maintained within that file. All personnel must provide their training and medical documentation to the HSS prior to starting work.

7.1.4 Entry Log

A log-in/log-out sheet will be maintained at the site by the SS. Personnel must sign in and out on a log sheet as they enter and leave the work area, and the SS may document entry and exit in the field notebook.

7.1.5 Entry Requirements

In addition to the authorization, hazard briefing, and certification requirements listed above, no person will be allowed in any work area unless they are wearing the minimum PPE, as described in Section 5 – Personal Protective Equipment.

7.1.6 Emergency Entry and Exit

People who must enter the work area on an emergency basis will be briefed of the hazards by the SS. All activities will cease in the event of an emergency. People exiting the work area because of an emergency will gather in a safe area for a head count. The SS is responsible for confirming that all people who entered the work area have exited in the event of an emergency.

7.1.7 Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

7.1.7.1 Exclusion Zone

An EZ may consist of a specific work area or may be the entire area of potential contamination. All employees entering an EZ must use the required PPE, and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or a site diagram will identify the location of each EZ.

7.1.7.2 Contamination Reduction Zone

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the SZ.

7.1.7.3 Support Zone

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to site requirements.

7.1.8 Posting

Work areas will be prominently marked and delineated using cones, caution tape, or a site diagram.

7.1.9 Site Inspections

The SS will conduct a daily inspection of site activities, equipment, and procedures to verify that the required elements are in place. A weekly LPO must also be completed and forwarded to the Project Manager for review.

7.2 Decontamination

7.2.1 Personnel Decontamination

All personnel wearing Modified Level D or Level C protective equipment in the EZ must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations at a minimum:

- Station 1 – Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.
- Station 2 – Personnel will remove their outer garment and gloves and dispose of it in properly labeled containers. Personnel will then decontaminate their hard hats and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.
- Station 3 – Personnel will thoroughly wash their hands and face before leaving the CRZ. Respirators will be sanitized and then placed in a clean plastic bag.

7.2.2 Equipment Decontamination

All vehicles that have entered the EZ will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

7.2.3 Personal Protective Equipment Decontamination

Where and whenever possible, single-use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers. Reusable protective clothing will be rinsed at the site with detergent and water. The rinseate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves, and covers must be thoroughly cleaned at the end of each work shift and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water, or by using a spray disinfectant.

8 TRAINING AND MEDICAL SURVEILLANCE

8.1 Training

8.1.1 General

All onsite project personnel who work in areas where they may be exposed to site contaminants must be trained as required by OSHA Regulation 29 CFR 1910.120 (HAZWOPER). Field employees also must receive a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their initial training more than 12 months prior to the start of the project must have completed an eight-hour refresher course within the past 12 months. The SS must have completed an additional eight hours of supervisory training, and must have a current first-aid/CPR certificate.

8.1.2 Basic 40-Hour Course

The following is a list of the topics typically covered in a 40-hour HAZWOPER training course:

- General safety procedures.
- Physical hazards (fall protection, noise, heat stress, cold stress).
- Names and job descriptions of key personnel responsible for site health and safety.
- Safety, health, and other hazards typically present at hazardous waste sites.
- Use, application, and limitations of PPE.
- Work practices by which employees can minimize risks from hazards.
- Safe use of engineering controls and equipment on site.
- Medical surveillance requirements.
- Recognition of symptoms and signs which might indicate overexposure to hazards.
- Worker right-to-know (Hazard Communication OSHA 1910.1200).
- Routes of exposure to contaminants.
- Engineering controls and safe work practices.
- Components of a health and safety program and a site-specific HASP.
- Decontamination practices for personnel and equipment.
- Confined-space entry procedures.
- General emergency response procedures.

8.1.3 Supervisory Course

Management and supervisors must receive an additional eight hours of training, which typically includes:

- General site safety and health procedures.
- PPE programs.
- Air monitoring techniques.

8.1.4 Site-Specific Training

Site-specific training will be accomplished by onsite personnel reading the Contractor's HASP or through a site briefing by the PM, SS, or HSS on the contents of this HASP before work begins. The review must include a discussion of the chemical, physical, and biological hazards; the protective equipment and safety procedures; and emergency procedures.

8.1.5 Daily Safety Meetings

A minimum of one daily safety meeting will be held to cover the work to be accomplished, the hazards anticipated, the PPE and procedures required to minimize site hazards, and emergency procedures per the Contractor's HASP. The SS or HSS should present these meetings prior to beginning the day's fieldwork and again after lunch, as required. No work will be performed in an EZ before a safety meeting has been held. A safety meeting must also be held prior to new tasks, and repeated if new hazards are encountered. An example Daily Safety Meeting Log is included in **Attachment H**.

8.1.6 First Aid and CPR

At least one employee current in first aid/CPR will be assigned to the work crew and will be on the site during operations. Refresher training in first aid (triennially) and CPR (annually) are required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

8.2 Medical Surveillance

8.2.1 Medical Examination

All personnel who are potentially exposed to site contaminants must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

8.2.2 Pre-Placement Medical Examination

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable regulations. The pre-placement and periodic medical examinations typically include the following elements:

- Medical and occupational history questionnaire.

- Physical examination.
- Complete blood count, with differential.
- Liver enzyme profile.
- Chest X-ray, at a frequency determined by the physician.
- Pulmonary function test.
- Audiogram.
- Electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination.
- Drug and alcohol screening, as required by job assignment.
- Visual acuity.
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project site work.

8.2.3 Other Medical Examinations

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials.
- At the discretion of the HSS, HSO, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials.

8.2.4 Periodic Exam

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 24 months.

8.2.5 Medical Restriction

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the HSS. The terms of the restriction will be discussed with the employee and the supervisor.

9 EMERGENCY PROCEDURES

9.1 General

Prior to the start of operations, the work area will be evaluated for the potential for fire, contaminant release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the SS/HSS immediately.

The SS/HSS will establish evacuation routes and assembly areas for the site. All personnel entering the site will be informed of this route and the assembly area.

9.2 Emergency Response

If an incident occurs, the SS or HS should take the following steps:

- Evaluate the incident and assess the need for assistance and/or evacuation.
- Call for outside assistance as needed.
- Confirm that the Project Manager is notified promptly of the incident.
- Take appropriate measures to stabilize the incident scene.

9.3 Fire

In the case of a fire on site, the SS/HSS will assess the situation and direct firefighting activities. The SS/HSS will confirm that the Project Manager is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that site personnel are unable to safely extinguish with one fire extinguisher, the local fire department will be summoned.

9.4 Contaminant Release

In the event of a contaminant release, the following steps will be taken:

- Notify SS/HSS immediately.
- Evacuate immediate area of release.
- Conduct air monitoring to determine needed level of PPE.
- Don required level of PPE and prepare to implement control procedures.

The SS/HSS has the authority to commit resources as needed to contain and control released material, and to prevent its spread to off-site areas.

9.5 Medical Emergency

All employee injuries must be promptly reported to the HSS/SS, who will:

- Confirm that the injured employee receives prompt first aid and medical attention.
- In emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room).

9.6 Emergency Care Steps

Upon entering an accident area, site personnel must follow these emergency care steps:

- Survey the scene. Determine if it is safe to proceed. Try to determine if the conditions that caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.
- Do a primary survey of the victim. Check for airway obstruction, breathing, and pulse. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- Phone emergency medical services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victim's condition, and help being given.
- Maintain airway and perform rescue breathing as necessary.
- Perform CPR as necessary.
- Do a secondary survey of the victim. Check vital signs and do a head-to-toe exam.
- Treat other conditions as necessary. If the victim can be moved, take him or her to a location away from the work area where EMS can gain access.

9.7 First Aid – General

All persons must report any injury or illness to their immediate supervisor or the SS. Trained personnel will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The SS and HSS must conduct an incident investigation as soon as emergency conditions no longer exist, and first aid and/or medical treatment has been confirmed. Incident investigations must be completed and submitted to the Project Manager within 24 hours after the incident.

If first-aid treatment is required, first-aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured person(s) should be transported to the medical facility. If the injured person is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance and/or paramedic should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

9.7.1 First Aid – Inhalation

Any employee complaining of symptoms of chemical overexposure as described in Section 4, General Safety Practices, will be removed from the work area and transported to the designated medical facility for examination and treatment.

9.7.2 First Aid – Ingestion

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information. If the victim is unconscious, keep them on their side and clear the airway if vomiting occurs.

9.7.3 First Aid – Skin Contact

Project personnel, who have had skin contact with contaminants will, unless the contact is severe, proceed through the CRZ to the wash area. Personnel will remove any contaminated clothing and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he or she shows any sign of skin reddening, irritation, or if he or she requests a medical examination.

9.7.4 First Aid – Eye Contact

Project personnel who have had contaminants splashed in their eyes, or who have experienced eye irritation while in the EZ, must immediately proceed to the eyewash station in the CRZ. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

9.7.5 Reporting Injuries, Illnesses, and Near-Miss Incidents

Injuries and illnesses, however minor, will be reported to the SS immediately. The SS will notify NYSEG immediately upon learning of a near-miss, injury or illness. The SS will complete an injury report and submit it to the Project Manager within 24 hours.

Near-miss incidents are situations in which no injury or property damage occurred, but under slightly different circumstances an injury or property damage could have occurred. Near misses are caused by the same factors as injuries; therefore, they must be reported and investigated in the same manner. An investigation must be done immediately after an injury, illness, near miss, or other incident to determine if it is safe to proceed with the work.

If an injury or illness is life-threatening or an emergency, please seek medical attention immediately. As soon as possible, notify your supervisor.

9.8 Emergency Information

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the daily safety meeting. These agencies are identified in Table 9-1. These contact numbers must be verified/updated in the Contractor's site- and task-specific HASP.

Table 9-4. Emergency Contacts in Case of Emergency Call 911

Agency/Name	Telephone No.
Police	911
Fire	911
Ambulance	911
Hospital: Noyes Memorial Hospital	585.335.6001
Contractor Project Manager	TBD
Contractor Site Supervisor	TBD
RG&E Project Manager: Jeremy Wolf	585.724.8548
NYSDEC Project Manager:	518.402.9662

9.8.1 Directions to Hospital (Non-Emergency)

It is the responsibility of the HSS to verify the directions to the hospital in the Contractor's site- and task-specific HASP.

Directions to: Noyes Memorial Hospital
111 Clara Barton Street
Dansville, New York, 14437

1. Head EAST on Park Street
2. Turn RIGHT onto Main Street 0.7 miles
3. Turn RIGHT onto South Street 0.1 miles
4. South Street bears LEFT and becomes Mt. Morris Road 2.0 miles
5. Continue onto NY-63 SOUTH 1.9 miles
6. Continue onto NY-408 SOUTH 0.3 miles
7. Turn LEFT onto Rt. 390 SOUTH to Corning 16.3 miles
8. Take Exit 4 to NY-36 towards Dansville/Hornell 0.4 miles
9. Turn LEFT onto NY-36 North/Clara Barton Street 0.5 miles
10. Arrive at Noyes Memorial Hospital

Total Distance: 21.5 miles

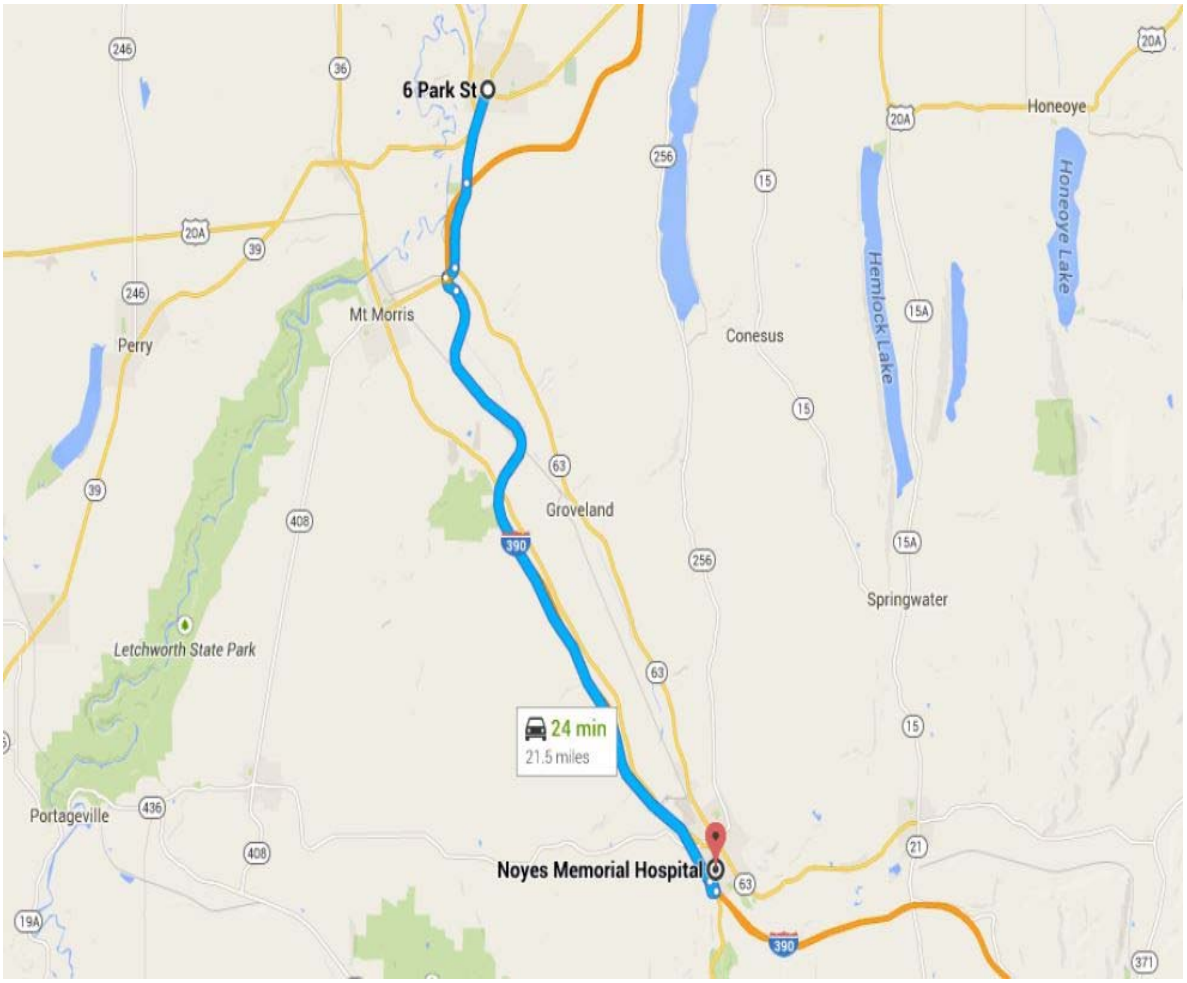


Figure 9-1. Route to Hospital

10 REFERENCES

Standard Operating Safety Guides, USEPA (Publication 9285.1-03, June 1992);

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH, OSHA, USCG, USEPA (86-116, October 1985);

Title 29 of the Code of Federal Regulations (CFR), Part 1910.120;

Title 29 of the Code of Federal Regulations (CFR), Part 1926;

Pocket Guide to Chemical Hazards, DHHS, PHS, CDC, NIOSH (2005);

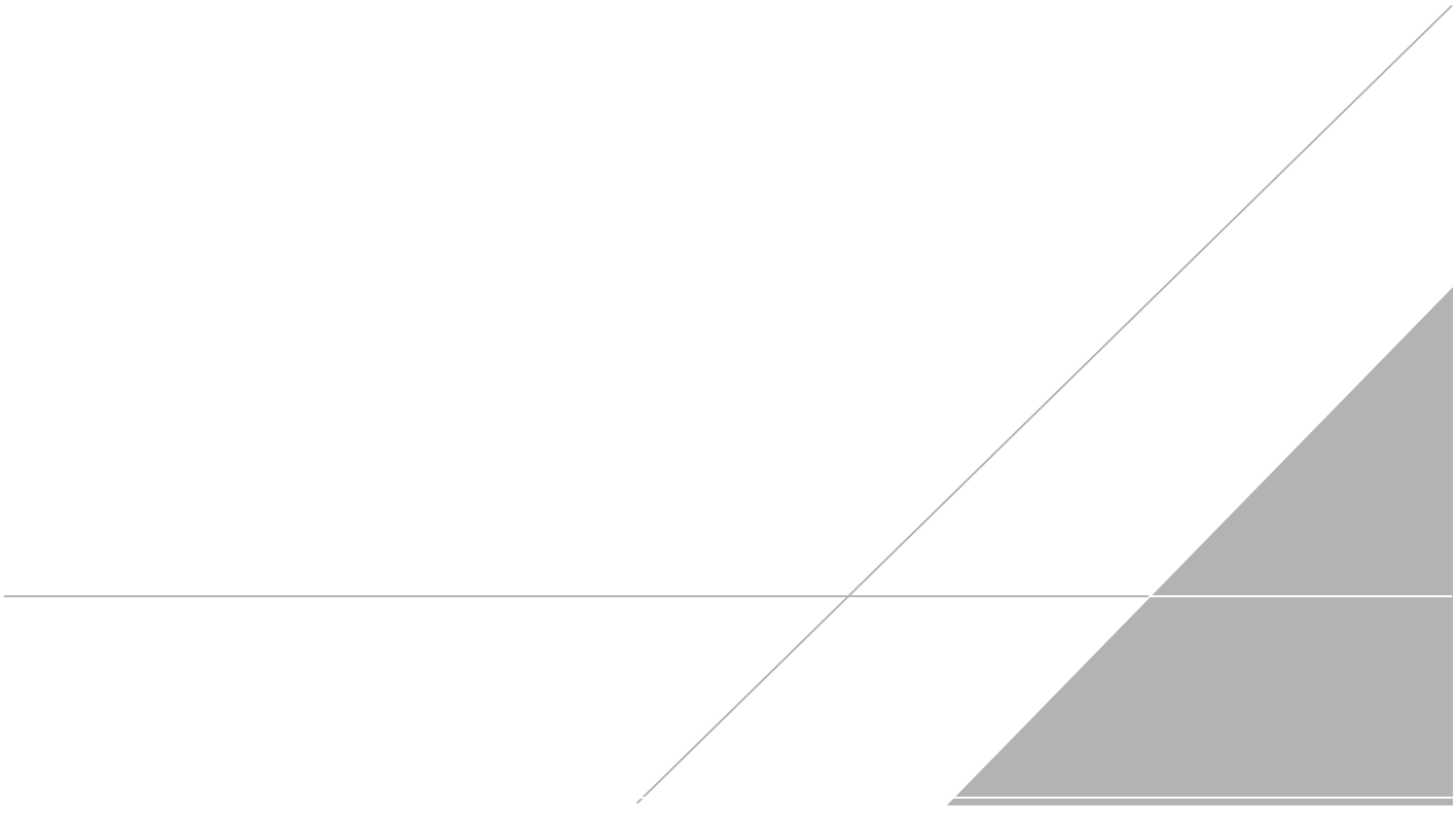
Threshold Limit Values, ACGIH (2008);

Guide to Occupational Exposure Values, ACGIH (2008);

Quick Selection Guide to Chemical Protective Clothing, Forsberg, K. and S.Z. Mansdorf, 5th Ed. (2005);

APPENDIX A

Example Employee Acknowledgement Form



ARCADIS
Infrastructure, environment, facilities

Health and Safety Plan Acknowledgment

I have read the Site-Specific Health and Safety Plan, or its contents have been presented to me, and I understand the contents and I agree to abide by its requirements.

Name (Print)	Signature	Representing	Date

APPENDIX B

Example Job Safety Analyses

Job Safety Analysis

General

JSA ID	7272	**Status**	(3) Completed
Job Name	General Industry-Site inspection/walkover - commercial/manufacturin	**Created Date**	4/9/2012
Task Description	Walkover-building	**Completed Date**	04/18/2012
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Byers, Susan	4/30/2012	4/9/2012	Edwards, Lauren	o
HASP Reviewer	Edwards, Lauren	4/23/2012	4/18/2012	Balcer, Denis	þ

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	PPE verification	1	Lack of adequate PPE at the facility could lead to injury	Prior to traveling to the site, ask the facility representative/escort for information on the types of PPE required. Verify that all necessary PPE is being worn and that PPE is in good working condition.	ARC HSGE015, ARC Field H&S Handbook Sec III-R.
2	Site safety orientation	1	Inability to quickly and safely exit an unfamiliar facility during an emergency	At the start of the site walk, ask the facility representative/escort for information regarding alarms, evacuation routes, and assembly areas.	
		2	Inability to recognize hazards prior to handling chemicals	At the start of the site walk, ask the facility representative/escort for the location of Material Safety Data Sheets.	
3	Building inspection and site walk	1	Slips, trips and falls	Use caution when walking on uneven or wet surfaces. Use proper footwear with good traction. Pay attention to where you are walking-including foot placement. Walk in designated areas and pathways. Maintain a safe distance from open holes and unprotected edges. Use handrails on stairways.	ARC HSIH008, ARC HSGE007, ARC HSFS021, ARC HSFS003, ARC HSIH013, Elevated Heights JSA, FHSB
		2	Acute exposure to hazardous chemicals	Wear appropriate gloves and eye protection when examining containers holding chemicals, wastes, and other potentially hazardous materials. Note the location of nearby eyewash stations and safety showers. Do not handle containers that are unlabeled or that are leaking. Do not open any chemical containers.	
		3	Falling from ladders	Climb ladders slowly, one person at a time. Maintain three points of contact. Do not climb fixed ladders that require fall protection (above 24 feet). Do not use portable ladders	
		4	Falling from elevated heights	Do not walk on elevated areas (greater than 4 feet above lower level) unless protected with a guardrail. Do not walk on scaffolding.	
		5	Falling from roofs	Do not walk on building roofs unless edges are protected with guardrails and skylights are guarded with railing or screens.	
		6	Hearing damage	Wear hearing protection when noise exceeds 85 dBA and in any areas labeled as requiring	ARC Field H&S Handbook Sec III-L

			hearing protection.	
		7	Hazardous atmosphere or entrapment in a confined space	Do not enter confined spaces, crawl spaces, tanks, utility vaults, or trenches.	ARC Field H&S Handbook Sec III-Y
		8	Vehicle / pedestrian accidents	Use caution when walking in areas with vehicle or forklift traffic. Establish eye contact with equipment operators. Maintain a safe distance from moving vehicles and equipment.	
		9	Heat illness	If the site walk involves the inspection of outdoor areas in weather conditions that pose a risk for heat illness (based on temperature, humidity, and sunshine), apply sunscreen and bring drinking water to the site walk.	ARC Field H&S Handbook Sec III-M
		10	Entrapment and pinch points in automatic gates	Do not walk through or underneath automatic gates designed for vehicles or forklifts.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	as appropriate for chemical hazards	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs	In excessive noise areas	Required
Miscellaneous PPE	traffic vest--Class II or III		Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	flashlight		Recommended

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Edwards, Lauren HASP Reviewer Approve 4/18/2012	

Job Safety Analysis

General

JSA ID	4053	**Status**	(3) Completed
Job Name	Infrastructure-Sewer sampling/inspection/measurements	**Created Date**	12/7/2010
Task Description	Confined Space Entry	**Completed Date**	12/08/2010
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Casaletta, Robert	4/23/2012	12/7/2010	Kundert, Brian	o
Developer	Rill, Rick	4/23/2012	12/7/2010	Kirsch, Clair	þ
Developer	Tansey, Jason	4/23/2012	12/7/2010	Stevenson, Robert	o
HASP Reviewer	Cameron, Anya	12/21/2010	12/8/2010	Edwards, Lauren	o
Quality Reviewer	Vogelsong, William	12/8/2010	12/8/2010	Suarez, Gustavo	þ

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Inspect all entry equipment and verify that air monitoring equipment is calibrated and functioning properly.	1	Injury or death	Verify that the multigas monitor is properly calibrated and functioning. The meter must have the ability to measure oxygen, lower explosive limit (LEL),hydrogen sulfide (H2S), and carbon monoxide (CO).	ARCADIS H&S Standard (ARC HSFS003) Confined Space Entry/ ARC Field H&S Handbook Sec III-Y
		2	Injury or death	Verify that all equipment is explosion proof or intrinsically safe.	
		3	Injury or death.	Inspect entry equipment (ladder, tri-pod, winch, harness, and other mechanisms) to assure they are in good working condition.	
2	Check weather forecast and coordinate entry operations with client's employees, police, fire and EMS agencies	1	Rain storm can cause flooding in confined space.	Check the weather forecast and weather history to ensure that there is not a chance of flooding during the entry into the confined space.	ARC Field H&S Handbook Sec III-I
		2	Injury in the confined space, as a result of emergency situations or incidents.	As applicable, contact the client, local safety forces (police & fire) and local EMS for any rescue type situations associated with the Confined Space entry work. Ensure that staff have the necessary training associated with emergency situations in the confined space.	ARC Field H&S Handbook Sec III-Y
3	Pre-entry meeting	1	Injury due to personnel not knowing their job requirements.	Assign the roles of entrants, attendants, and supervisor to employees with the required Confined Space training.	ARCADIS H&S Standard (ARC HSFS003) Confined Space Entry, ARC Field H&S Handbook Sec III-Y
		2	Injury or death	Discuss the emergency procedures and review the names of personnel that will be contacted in the event of an emergency.	
		3	Injury or death	Conduct a Tailgate Meeting to review the planned work activities and associated hazards for the confined space work period.	
		4	Injury or death	Complete the Confined Space Entry Checklist in Section 5 of the ARCADIS H&S	

				Standard (HSFS003 Confined Space Entry).	
4	Prepare site and enter confined space.	1	Traffic hazards	Use the buddy system to set up traffic control equipment and devices. Refer to the STAR plan or Traffic Control Plan to ensure proper setup.	ARCADIS H&S Standard (ARC HSFS003) Confined Space Entry/ ARC Field H&S Handbook Sec III-Y.
		2	Injury, death, and inadequate oxygen levels.	Test the air in confined space with multi gas detector prior to entry. Obtain readings at top, middle, and bottom of confined space to determine atmospheric conditions.	
		3	Injury and death, inadequate oxygen, low lighting conditions.	A multi gas meter will be used to continually monitor the air conditions in the confined space. The attendant and the entrant will be in constant contact throughout the entry. Entrant will proceed slowly and will not lose contact with the attendant for any reason while in the confined space.	
		4	Slips, trips, falls, and pinch points	Wear steel-toe boots and leather gloves when lifting heavy objects. Bend at the knees when lifting and have a clear path to the location before lifting it.Use buddy system if object is too heavy or bulky.	
5	Demobilization	1	Traffic hazards, lifting strain, pinch points.	Use the buddy system while removing traffic controls. Wear leather gloves while handling barricades and confined space equipment. Bend at the knees when lifting heavy objects. Have a clear path and a location to place the objects before moving it. Cleanup entry equipment and work area.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	chemical protective suit (specify type)	Tyvek	Required
	coveralls		Recommended
	long sleeve shirt/pants		Required
Eye Protection	safety glasses		Required
Foot Protection	outer boot covers		Recommended
	steel-toe boots		Required
Hand Protection	work gloves (specify type)	Leather & nitrile	Required
Head Protection	hard hat		Required
Miscellaneous PPE	other	fall arrest rescue harness and tripod	Required
	traffic vest--Class II or III		Required
Respiratory Protection	supplied air		Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
	walkie talkie		Recommended
Miscellaneous	auxilary lighting	Intrinsically safe Headlamp	Required
	fire extinguisher		Required
	first aid kit		Required
	flashlight	Intrinsically safe	Required
	Other	ladder or tripod w/winch	Required
	Other	duct Tape	Required
	Other	Multi Gas meter	Required
Personal	eye wash (specify type)	Eye saline	Required
	insect repellant	deet>90	Recommended

	water/fluid replacement		Recommended
Traffic Control	barricades		Required
	traffic cones		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Cameron, Anya HASP Reviewer Approve 12/8/2010	I would remind staff to complete confined space entry checklists which are mandatory and cover most of this information. Otherwise, this is a great reference guide.
Employee: **Role** **Review Type** **Completed Date**	Vogelsong, William Quality Reviewer NA 12/8/2010	Excellent; suggest advising, discussing, coordinating entry operations with client's H&S Mngr prior to.

Job Safety Analysis

General

JSA ID	45	**Status**	(3) Completed
Job Name	Environmental-Groundwater Sampling and free product recovery	**Created Date**	2/4/2009
Task Description	Groundwater sampling	**Completed Date**	02/06/2009
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Coppola, Mija	6/12/2012	2/4/2009	Mcburney, Lowell	þ
HASP Reviewer	Coppola, Mija	2/6/2009	2/6/2009	Mcburney, Lowell	þ

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Stage at pre-determined sampling location and set up work zone and sampling equipment	1	Personnel could be hit by vehicular traffic	Set up cones and establish work area. Position vehicle so that field crew is protected from site traffic. Unload as close to work area as safely possible.	ARC Field H&S Handbook Sec III-G
		2	Sampling equipment, tools and monitoring well covers can cause tripping hazard	Keep equipment picked up and use TRACK to assess changes.	
2	Open wells to equilibrate and gauge wells	1	When squatting, personnel can be difficult to see by vehicular traffic.	Wear class II traffic vest if wells are located proximal to vehicular traffic. Use tall cones and the buddy system if practicable.	
		2	Pinchpoints on well vault can pinch or lacerate fingers	Use correct tools to open well vault/cap. Wear leather gloves when removing well vault lids, and chemical protective gloves while gauging. Wear proper PPE including safety boots, knee pads and safety glasses.	
		3	Lifting sampling equipment can cause muscle strain	Unload as close to work area as safely possible; use proper lifting and reaching techniques and body positioning; don't carry more than you can handle, and get help moving heavy or awkward objects.	
		4	Pressure can build up inside well causing cap to release under pressure	Keep head away from well cap when removing. If pressure relief valves are on well use prior to opening well	
3	Begin Purging Well and Collecting Parameter Measurements	1	Electrical shock can occur when connecting/disconnecting pump from the battery.	Make sure equipment is turned off when connecting/disconnecting. Wear leather gloves. Use GFCIs when using powered tools and pumps. Do not use in the rain or run electrical cords through wet areas.	ARC Field H&S Handbook Sec III-AA
		2	Purge water can spill or leak from equipment	Stop purging activities immediately, stop leakage and block any drainage grate with absorbent pads. Call PM to notify them of any reportable spill.	
		3	Water spilling on the ground can cause muddy/slippery conditions	Be careful walking in work area when using plastic around well to protect from spillage	
		4	Lacerations can occur when cutting materials such as plastic tubing	When cutting tubing, use tubing cutter. No open fixed blades should ever be used. When possible wear work gloves, leather type.	

		5	Purge water can splash into eyes	Pour water slowly into buckets/drums to minimize splashing. Wear safety glasses.	
4	Collect GW or Free Product Sample	1	Working with bailer rope can cause rope burns on hands.	Slowly raise and lower the rope or string for the bailer. Wear appropriate gloves for the task.	
		2	Sample containers could break or leak preservative	Discard any broken sampleware or glass properly. Do not overtighten sample containers. Wear chemical protective gloves.	
5	Recovery of Free Product from well	1	Exposure to free product	Additional chemical protection may be necessary based on the type of product. Additionally, safety goggles, a faceshield, or respiratory protection may be required. Verify in the HASP.	
6	Staging of Well Purge water and/or Free Product	1	Muscle strains can occur when moving purge water or drums	If using buckets, do not fill buckets up to the top. Always keep lid on buckets when traveling or moving them to another location. Only half fill buckets so when dumping the buckets weigh less. See drum handling JSA for movement of drums.	ARC Field H&S Handbook Sec III-II

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	long sleeve shirt/pants		Recommended
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Recommended
Miscellaneous PPE	other	Knee pads	Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Decontamination	Decon supplies (specify type)	alconox, DI water, spray bottle	Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	flashlight		Required
Personal	eye wash (specify type)	bottle	Required
	insect repellant		Recommended
	sunscreen		Recommended
Traffic Control	barricades		Recommended
	traffic cones		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Coppola, Mija HASP Reviewer Approve 2/6/2009	

Job Safety Analysis

General

JSA ID	6684	**Status**	(3) Completed
Job Name	Environmental-Air Monitoring	**Created Date**	1/24/2012
Task Description	Indoor Air Sampling	**Completed Date**	01/25/2012
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Edwards, Lauren	5/22/2012	1/24/2012	Balcer, Denis	þ
HASP Reviewer	Edwards, Lauren	2/7/2012	1/25/2012	Balcer, Denis	þ
Quality Reviewer	Lee, Johannes	2/6/2012	2/6/2012	Proffitt, David	þ

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Driving to and from sampling locations.	1	Striking or being struck by another object or vehicle	Follow the 5 Keys of Smith System Driving	ARC Field H&S Handbook Sec III-U, Motor Vehicle Safety HS Standard ARCHSGE004
2	Approach residence and communicate with occupant	1	Hostile or agitated occupants. Occupants may be potentially violent.	Use Stop Work Authority. Never approach a residence alone; always use the buddy system. Always have a cell phone. Do not attempt to enter a residence or communicate with it's occupants, if you feel threatened in any way. Leave the property and call 911 if there is clear and present danger. Call PM after contacting the appropriate authorities. Do not attempt to interact with the occupants but leave the area and wait for authorities. Communicate regurlarly with PM, giving addresses of each residence prior to entry.	ARC Field H&S Handbook Sec III-H, Stop Work Authority HS Standard ARCHSGE009
3	Enter home to conduct sampling activities	1	Hostile or agitated occupants. Occupants may be potentially violent. Weapons may be present. Illegal drug use may be occurring.	Use Stop Work Authority. Never approach a residence alone; always use the buddy system. Always have a cell phone. Do not attempt to enter a residence or communicate with its occupants, if you feel threatened in any way. Leave the property and call 911 if there is clear and present danger. Call PM after contacting the appropriate authorities. Do not attempt to interact with the occupants but leave the area and wait for authorities. Communicate regurlary with PM, giving addresses of each residence prior to entry.	Tailgate Meeting HS Standard, PPE HS Standard, Motor Vehicle Safety HS Standard, ARC Field H&S Handbook Sec III-H
		2	Personal hygiene issues in the residence such as extreme filth, animal and/or pet feces, insect infestation.	Use Stop Work Authority. Contact PM and re-evaluate hazards. Do not attempt to communicate with occupants of the residence regarding the conditions of the home. Consult with HR, Legal Department, H&S, project management team, supervisor and client as necessary to determine the safest approach. Re-entry may require additional PPE.	
		3	Visible and excessive rodent feces.	Contact PM and re-evaluate hazards. Do not attempt to communicate with occupants of the residence regarding the conditions of the home. If it is determined the re-entry is	

				possible. Level C PPE must be worn, including a minimum P100 particulate air purifying respirator (APR).	
4	Sample Canister - sampling prep, collection and shipping	1	Heavy Lifting	Use a dolly, when necessary, to move canisters to and from your vehicle. Practice good lifting techniques and keep your back straight. Avoid twisting or awkward movements/positions. Remove canisters from the box and transport individually. If the box or other equipment are too heavy, request assistance in lifting.	ARC Field H&S Handbook Sec III-EE
		2	Cuts or lacerations from opening the box of canisters	Use appropriate cutting tools such as safety knives and cut away from your body when opening the box.	
		3	Pinch points	Use proper tools for adjusting canister valves. Wear gloves when necessary	
		4	Limited visibility - evening hours	Have a flashlight available or a head lamp for hands free light. Try and schedule work during daylight hours and end sampling events early enough to allow for clean up before dusk.	
5	Sub-Slab soil vapor sampling	1	Slips, trips, falls. Pinch points. Eye injury from debris. Injury from lifting and carrying equipment.	Wear work gloves when handling equipment/materials. Practice good housekeeping. Unload equipment as close to work area as possible. Keep equipment and supplies organized. Wear work gloves when handling equipment/materials. Use correct size wrenches when assembling sampling train. Use safety goggles. Practice good lifting techniques and keep your back straight. Avoid twisting or awkward movements/positions. Use two people to lift items heavier than 50 pounds.	ARC Field H&S Handbook Sec III--AA,CC,L.
		2	Electrical shock from the improper use of power tools (electric hammer drill)	Wear appropriate gloves. Do not remove any safety guards from power tools. Inspect power cords for damage/wear. Be aware of potential for hidden electric sources. Make sure your power source is rated appropriately for the equipment being used. Always unplug equipment before peforming any repairs.	
		3	Lacerations from cutting of sample tubing	Use appropriate cutting device and wear gloves when handling blades. Collect purged soil vapor in a Tedlar bag. Discharge purged soil vapor outside building.	
		4	Exposure to constituents in soil vapor	Collect purged soil vapor in a Tedlar bag. Discharge purged soil vapor outside building. Perform air monitoring to monitor exposure.	
		5	Excessive noise generated by hammer drill operation	During drilling operations, hearing protection should be used.	

PPE	**Personal Protective Equipment**		
Type	**Personal Protective Equipment**	**Description**	**Required**
Eye Protection	faceshield		Required
	safety glasses		Required
	safety goggles	When using electric hammer drill	Required
Foot Protection	boots		Required
	steel-toe boots	w/ steel shank	Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	Leather	Required
Head Protection	hard hat	If wearing does not cause hazard	Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	other	Fall protection when working at heights	Required

Respiratory Protection	full face respirator	When sampling friable asbestos	Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	flashlight		Recommended
Personal	eye wash (specify type)		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Edwards, Lauren HASP Reviewer Approve 1/25/2012	
Employee: **Role** **Review Type** **Completed Date**	Lee, Johannes Quality Reviewer NA 2/6/2012	1. Reads like the possibility exists for the building structure to be unsound. If so, beware of trip and fall hazards that may be presented by poor flooring/floor cover conditiion. 2. If sampling involves access to attic spaces, will need to have adequate load-supporting temporary stepping platforms between ceiling joists. 3. Operations requiring climbing/crawling with hands would indicte the need for hands-free illumination (head/hat-mounted lamps).

Job Safety Analysis

General

JSA ID	166	**Status**	(3) Completed
Job Name	Environmental-Sample cooler handling	**Created Date**	5/1/2009
Task Description	Sample cooler handling	**Completed Date**	05/13/2009
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Coppola, Mija	12/19/2011	5/11/2009	Mcburney, Lowell	þ
HASP Reviewer	Moyers, Sam	5/25/2009	5/13/2009	Kundert, Brian	þ

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Transfer field samples to sample packing area	1	Lifting heavy coolers may result in muscle strain especially to lower back.	Use proper lifting techniques and keep back straight. Use buddy system for large coolers, Use mechanical aids like hand trucks if readily available to move coolers. Do not over fill coolers with full sample containers for temporary movement to the sample prep area. Ensure an adequate supply of sample coolers are in field.	
		2	Hazards to hands from broken glass caused by over tightening lids or improper placement in cooler	Inspect all bottles and bottle caps for cracks/leaks before and after filling container. Do not over tighten sample lids. Clean up any broken bottles immediately, avoid contact with sample preservatives. Wear leather gloves when handling broken glass.	
		3	Exposure to chemicals (acid preservatives or site contaminants) on the exterior of sample bottles after filling.	Wear protective gloves for acid preservatives and safety glasses with side shields during all sample container handling activities (before and after filling), Once filled follow project specific HASP PPE requirements for skin and eye protection.	
		4	Samples containing hazardous materials may violate DOT/IATA HazMat shipping regulations	All persons filling a sample bottle or preparing a cooler for shipment must have complete ARCADIS DOT HazMat shipping training. Compare the samples collected to the materials described in the Shipping Determination for the Project and ensure consistent. Re-perform all Shipping determinations if free product is collected and not anticipated during planning.	
2	Sample cooler selection	1	Sample coolers with defective handles, lid hinges, lid hasps cracked or otherwise damaged may result in injury (cuts to hands, crushing of feet if handle breaks etc)	Only use coolers that are new or in like new condition, No rope handled coolers unless part of the manufacturer's handle design.	ARCADIS Shipping Guide US-001
		2	Selection of excessively large coolers introduces lifting hazards once the cooler is filled.	Select coolers and instruct lab to only provide coolers of a size appropriate for the material being shipped. For ordinary sample shipping sample coolers should be 48 quart capacity or smaller to reduce lifting hazards.	
3	Pack Samples	1	Pinch points and abrasions	Beware that lid could slam shut; block/brace	

			to hands from cooler lid closing unexpectedly	if needed; be wary of packing in strong winds. New coolers may be more prone to self closing, tilt cooler back slightly to facilitate keeping lid open.	
		2	Awkward body positions and contact stress to legs and knees when preparing coolers on irregular or hard ground surfaces.	Plan cooler prep activities. Situate cooler where neutral body positions can be maintained if practical, like truck tailgate. Avoid cooler prep on rough gravel surfaces unless knees and legs protected during kneeling.	
		3	Frostbite or potential for oxygen deficiency when packing with dry ice. Contact cold stress to fingers handling blue ice or wet ice	Dry ice temperature is -109.30F. Wear thermal protective gloves. DO NOT TOUCH with bare skin! Dry ice sublimates at room temp and could create oxygen deficiency in closed environment. Maintain adequate ventilation! Do not keep dry ice in cab of truck. Wear gloves when handling blue ice or gaging wet ice. Dry Ice is DOT regulated for air shipping, follow procedures in Shipping Determination.	
4	Sealing, labeling and Marking Cooler	1	Cuts to hands and forearms from strapping tape placement or removing old tape and labels	Do not use a fixed, open-blade knife to remove old tags/labels, USE SCISSORS or other safety style cutting device. Only use devices designed for cutting. Do not hurry through task.	
		2	Lifting and awkward body position hazards from taping heavy coolers, dropping coolers on feet during taping.	Do not hurry through the taping tasks, ensure samples in cooler are evenly distributed in cooler to reduce potential for overhanging cooler falling off edge of tailgate/table when taping.	
		3	Improper labeling and marking may result in violation of DOT/IATA HazMat shipping regulations delaying shipment or resulting in regulatory penalty	Do not deviate from ARCADIS Shipping Guide or Shipping Determination marking or labeling requirements.	
5	Offering sample cooler to a carrier or lab courier for shipment.	1	Lifting heavy coolers may result in muscle strain especially to lower back.	See lifting hazard controls above.	
		2	Carrier refusal to accept cooler may cause shipping delay and/or result in violation of DOT HazMat shipping regulations.	Promptly report all rejected and refused shipments to the ARCADIS DOT Program Manager. Do Not re-offer shipment if carrier requires additional labels markings or paperwork inconsistent with your training or Shipping Determination without contacting the ARCADIS DOT Compliance Manager.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Hand Protection	chemical resistant gloves (specify type)	nitrile	Required
	work gloves (specify type)	leather	Required

Supplies

Type	Supply	Description	Required
Miscellaneous	Other	Scissors	Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Moyers, Sam HASP Reviewer Revise 5/11/2009	Kevlar is required? Leather work gloves are listed. i suggest just leather gloves.

Employee:	Moyers, Sam	
Role	HASP Reviewer	
Review Type	Approve	
Completed Date	5/13/2009	

Job Safety Analysis

General

JSA ID	44	**Status**	(3) Completed
Job Name	Environmental-Drilling, soil sampling, well installation	**Created Date**	2/4/2009
Task Description	Drilling, soil sampling, and well installation	**Completed Date**	02/04/2009
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Coppola, Mija	6/28/2012	2/4/2009	Mcburney, Lowell	þ
HASP Reviewer	Coppola, Mija	2/6/2009	2/2/2009	Mcburney, Lowell	þ

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Set up necessary traffic and public access controls	1	Struck by vehicle due to improper traffic controls	Use a buddy system for placing site control cones and/or signage. Position vehicle so that you are protected from moving traffic. Wear Class II traffic vest	ARC Field H&S Handbook Sec III-G
2	Utility Clearance	1	Potential to encounter underground or above ground utilities while drilling.	Complete utility clearance in accordance with the ARCADIS Utility Clearance H&S Standard.	ARCADIS H&S Standard ARCHSFS019, ARC Field H&S Handbook Sec III-MM
3	General drill rig operation	1	Excessive noise is generated by rig operation.	When the engine is used at high RPMs or soil samples are being collected, use hearing protection.	ARC Field H&S Handbook Sec III-L
		2	During drill rig operation, surfaces will become hot and cause burns if touched, and COCs in the soils more readily vaporize generating airborne contaminates.	Due to friction and lack of a drilling fluid, heat will be produced during this method. Mainly drill augers. Be careful handling split spoons. Wear proper work gloves. When soils and parts become heated, the COC could volatilize. Air monitoring should always be performed in accordance with the HASP.	
		3	Moving parts of the drilling rig can pull you in causing injury. Pinch points on the rig and auger connections can cause pinching or crushing of body parts.	Stay at least 5 feet away from moving parts of the drill rig. Know where the kill switch is, and have the drillers test it to verify that it is working. Do not wear loose clothing, and tie long hair back. Avoid wearing jewelry while drilling. Cone off the work area to keep general public away from the drilling rig.	
		4	Dust and debris can cause eye injury and soil cuttings and/or water could contain COCs.	Wear safety glasses and stay as far away from actual drilling operation as practicable. Wear appropriate gloves to protect from COCs.	ARC Field H&S Handbook Sec III-R
		5	Drilling equipment laying on the ground (i.e. augers, split spoons, decon equipment, coolers, etc), create a tripping hazard. Water from decon buckets generate mud and cause a slipping hazard.	Keep equipment and trash picked up, and store away from the primary work area.	ARC Field H&S Handbook Sec III-F
		6	The raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the	

				Utility Clearance H&S Standard for guidance.	
4	Mudd rotary drilling	1	The raised derrick can strike overhead utilities, tree limbs or other elevated items.	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
		2	This technology uses fluid, which collects with sediments in large basin. Fluid can splash out and cause slipping/mud hazard. Liquid mixture can splash into your eyes.	Wear rubber boots if needed, and keep clear of muddy/wet area as much as practicable. If area becomes excessively muddy, consider mud spikes or covering the area with a material that improves traction. Wear safety glasses.	
5	Hollow stem auger drilling	1	All hazards in step 3 apply. Additionally,The raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
		2	Hands or fingers can get caught and crushed if trying to clean by hand or with tools while the auger is still turning.	Auger should always be stopped and clutch disengaged prior to cleaning.	
6	Air Rotary Drilling	1	This drilling method works with high air pressure and can generate flying debris that can strike your body or get in your eyes.	When the drill rig is being driven into media, it will produce flying debris. The flaps behind the drill rig should stay closed whenever possible to reduce the risk of flying debris. Safety glasses and hard hat should always be worn when the drill rig is operating. When penetrating asphalt, protect surrounding cars that may be present to avoid damage to pain or windshields.	
		2	The raise derrick can strike overhead utilities, tree limbs or other elevated items.	Never move this rig with the derrick up. Ensure there is proper clearance to raise the derrick and that you are far enough away from overhead power lines. See the Utility clearance H&S Standard for guidance.	
		3	When drilling through bedrock prior to groundwater, dust can be produced from pulverization. Inhalation of dusts/powder can occur.	Supplemental water should be used to manage dust and/or dust masks should be used if necessary.	
7	Reverse rotary drilling	1	This method will use fresh water to pump out drill cuttings through the center of the casing. Water/sediment mixture is generated and could cause contact with impacted soils or groundwater.	Ensure the pit construction can hold the amount of cuttings that are anticipated. Air monitoring should also be used of pit area.	
		2	Fire hydrants are often used for water source. Hydrants deliver water at high pressure. Pressurized water can cause flying parts/debris and excessive slipping hazards.	Water usage from fire hydrants should be cleared with local municipalities prior to use. Only persons that know how to use the hydrant should be performing this task. Ensure all connections are tight, and hose line is not run over to cut by traffic. Any leaks from the hydrant should be reported immediately.	
		3	Settling pit construction can cause tripping hazard from excavated soils, and plastic sheeting can cause slipping.	Cone off the area to keep the general public/visitors away from the settling pit. Ensure proper sloping of excavation.	
		4	The raised derrick can strike overhead utilities, tree limbs or other elevated items.	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	

8	Rotosonic drilling	1	Fire hydrants are often used for water source. Hydrants deliver water at high pressure. Pressurized water can cause flying parts/debris and excessive slipping hazards.	Water usage from fire hydrants should be cleared with local muncipalities prior to use. Only persons that know how to use the hydrant should be performing this task. Ensure all connections are tight, and hose line is not run over to cut by traffic. Any leaks from the hydrant should be reported immediately.	
		2	This method requires a lot of clearance. The drill head can turn 90 degrees to attach to the next drill flight or casing. This usually requires a large support truck to park directly behind the rig. As the drill head raises the new casing flight is angled down at the same time until it can be turned completely vertical.	Ensure sufficient overhead clearance.	
		3	Heavy lifting of cores can cause muscle strain.	Always use 2 people to move core containers. Use caution moving core samples to layout area. Plan layout area to ensure adequate aisle space between core runs for logging. Keep back straight and use job rotation.	
		4	The rotosonic drill head can move very quickly up and down while working on a borehole. Moving parts can strike someone or catch body parts.	The operator and helper must communicate and stay clear of the path of the drill head. The drill utilizes two large hydraulic clamps to continuously hold casings while load/unloading previous casings. Do not wear loose clothing.	
9	Direct push drilling	1	The drill rods will be handled by workers most of the time rather than the rig doing it, therefore pinch points can cause lacerations and crushing of fingers/body parts.	Keep a minimum of 5 feet away from drill rig operation and moving parts.	
		2	The direct push rigs are usually meant to fit in spaces where larger rig can't. Tight spaces can pin workers.	Do not put yourself between the rig and a fixed object. Use Spotters or a tape measure to ensure clearances in tight areas. Pre-plan equipment movement from one location to the next.	
		3	Some direct push equipment is controlled by wireless devices. These controls can fail and equipment can strike workers or cause damage to property.	The drill rig should be used in a large open area to test wireless controls prior to moving to boring locations. The operator of the rig will test the kill switch with wireless remote prior to use. Operator will stay in range of rig while moving so that wireless signal will not be too weak and cause errors to the controls.	
		4	Sampling sleeves must be cut to obtain access to soil. Cutting can cause lacerations.	It's preferable to let the driller cut the sleeves open. Many drillers have holders for the sleeve to allow for stability when cutting. If you cut the sleeves, use a hook blade, change blade regularly, and cut away from the body.	
		5	Soil cores may contain contaminated media.	Wear nitrile gloves and saftey glasses for protection from contaminated media when logging soil borings.	
10	Rock coring	1	Flying debris can hit workers or cause debris to get in eyes.	Rock chips or overburden may become airborne from drilling method. Wear safety glasses and hard hat and remain at a safe distance from back of drill rig.	
		2	Heavy lifting of cores can cause muscle strain.	Always use 2 people to move core containers. Use caution moving core samples to layout area. Plan layout area to ensure adequate aisle space between core runs for logging. Keep back straight and use job rotation.	
11	Sample collection and processing	1	Injuries can result from pinch points on sampling	Care should be taken when opening sampling equipment. Look at empty	Sample Cooler Handling JSA

			equipment, and from breakage of sample containers.	containers before picking them up, and do not over-tighten container caps. Use dividers to store containers in the cooler so they do not break.	
		2	Lifting heavy coolers can cause back injuries.	Use two people to move heavy coolers. Use proper lifting techniques.	
12	Monitoring well installation	1	Same hazards as in Step 3 with general drill rig operation	See step 3	
		2	Monitoring well construction materials can clutter the work area causing tripping hazards.	Well construction materials should be picked up during the well installation process.	
		3	Heavy lifting can cause muscle strains, and cutting open bags can cause lacerations.	Well construction materials are usually 50 lbs or greater. Team lift or use drill rig to hoist bags. Always use work gloves while cutting open bags.	
		4	Well pack material (i.e. sand, grout, bentonite) can become airborne and get in your eyes.	Wear safety glasses for protection from airborne sand and dust.	
		5	Cutting the top of the well to size can cause jagged/sharp edges on the top of the well casing.	Wear gloves when working with the top of the well casing, and file any sharp jagged edges that resulted from cutting to size.	
13	Soil cutting and purge water management	1	Moving full drums can cause back injury, or pinching/crushing injury.	Preferably have the drilling contractor move full drums with their equipment. If this is not practicable, use lift assist devices such as drum dollies, lift gates, etc. Employ proper lifting techniques, and perfrom TRACK to identify pinch/crush points. Wear leather work gloves, and clear all walking and work areas of debris prior to moving a drum.	ARC Field H&S Handbook Sec III-II

PPE **Personal Protective Equipment**

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	traffic vest--Class II or III		Required
Respiratory Protection	dust mask		Recommended

Supplies

Type	Supply	Description	Required

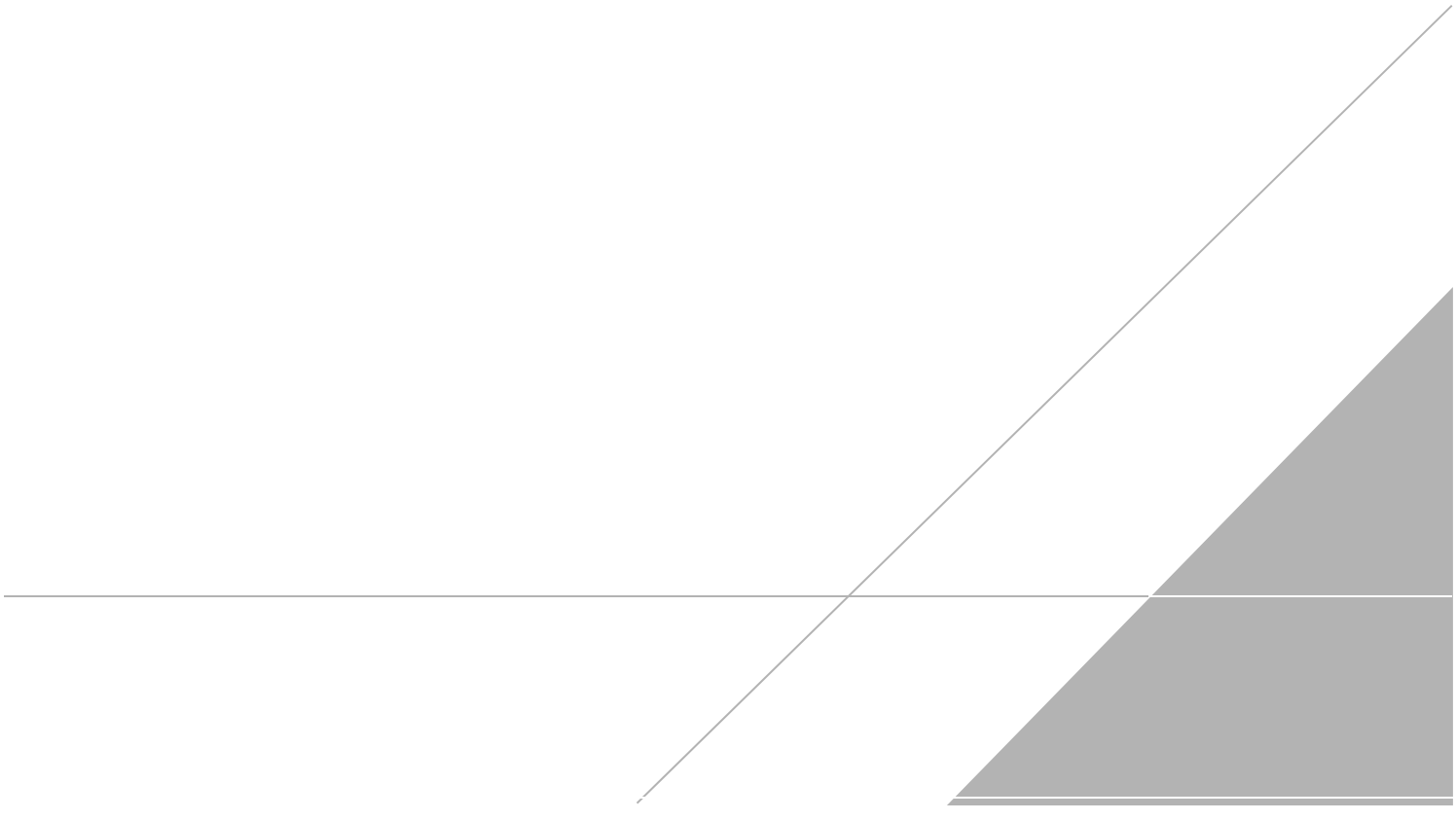
Communication Devices	mobile phone		Required
Decontamination	Decon supplies (specify type)	Driller to provide and manage	Recommended
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
Personal	eye wash (specify type)	bottle	Required
	water/fluid replacement		Recommended
Traffic Control	traffic cones		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Coppola, Mija HASP Reviewer Approve 2/2/2009	

APPENDIX C

Example Utility and Structure Checklist



Example Utilities and Structures Checklist

Project: _____
Project Number: _____
Date: _____

Work locations applicable to this clearance checklist **(Photo Document Work Locations)**:

THIS FORM MUST BE COMPLETED IN ENTIRETY PRIOR TO BEGINNING ANY INTRUSIVE WORK

Pre-Field Work

One Call or "811" notified 48-72 hours in advance of work? ☐ Yes ☐ No
Utility companies notified during the One Call process ☐ See attached ticket

_____ _____ _____ _____
_____ _____ _____ _____

List any other utilities requiring notification: ☐ None

_____ _____ _____ _____

Private Locator Contacted ☐ Yes ☐ No

Plan private utility clearance subcontractor assignments, areas, required clearance equipment, depth of clearance needed, types of utilities

Client provided utility maps or "as built" drawings showing utilities? ☐ Yes ☐ No

Field Work - This must be completed on site, by staff who have a minimum of one year of field experience in identifying utilities

Lines of Evidence - Must have **3 Reliable Lines of Evidence** Prior to Starting any Intrusive Work

☐ One Call/"811"
Utility Markings Present: ☐ Paint ☐ Pin flags/stakes ☐ Other ☐ None
☐ Client Provided Maps/Drawings **OR** ☐ Maps/Drawings requested but not provided
☐ Client Clearance Name(s)/Affiliation(s) _____
☐ Interview(s): Name(s)/Affiliation(s) _____
_____
_____

Did person(s) interviewed indicate depths of any utilities in the subsurface?
☐ Yes, depths provided:
☐ Did not know or refused to answer
Additional Comments:

☐ Site Inspection & Complete Site Sketch **(Photo Document Marked Utilities & Utility Structures)**
☐ GPR
☐ Air-Knife
☐ Hydro-Knife
☐ Public Records/Maps
☐ Radiofrequency
☐ Metal Detector
☐ Handauger
☐ Potholing
☐ Probing
☐ Private Locator: Name and Company: _____
☐ Marine Locator: Name and Company: _____
☐ Other: _____
_____

Tips for Successful Utility Location:
1. Don't forget to look up
2. Be on site when utilizing private utility locators
3. Select alternate/backup locations during clearance process
4. Mark out all known utilities. Leave nothing to question
5. No hammering- no pickaxes-no digging bars-no hurrying or shortcutting
6. No excessive turning or downward force of handaugers/shovels, etc.
7. Utilities may run directly under asphalt/concrete or be > 5 ft. in depth

T R A C K
Site Inspection

Example Utilities and Structures Checklist

During the site inspection look for the following **("YES" requires additional investigation and must be marked properly prior to performing intrusive work)**:

		Utility Color Codes		
a)	Natural gas line present (evidence of a gas meter)?	Yellow	☐ Yes	☐ No
b)	Evidence of electric lines:	Red		
	i) Conduits to ground from electric meter or along wall?		☐ Yes	☐ No
	ii) Light poles, electric devices with no overhead lines?		☐ Yes	☐ No
	iii) Overhead electric lines present?		☐ Yes	☐ No
c)	Evidence of sewer drains:	Green		
	i) Restrooms or kitchen on site?		☐ Yes	☐ No
	ii) Sewer cleanouts present?		☐ Yes	☐ No
	iii) Combined sewer /storm lines or multiple sewer lines?		☐ Yes	☐ No
d)	Evidence of water lines:	Blue		
	i) Water meter on site or multiple water lines?		☐ Yes	☐ No
	ii) Fire hydrants in vicinity of work?		☐ Yes	☐ No
	iii) Irrigation systems? (Sprinkler heads, valve boxes, controls in building)		☐ Yes	☐ No
e)	Evidence of storm drains:	Green		
	i) Open curbside or slotted grate storm drains		☐ Yes	☐ No
	ii) Gutter down spouts going into ground		☐ Yes	☐ No
f)	Evidence of telecommunication lines:	Orange		
	i) Fiber optic warning signs in areas?		☐ Yes	☐ No
	ii) Lines from cable boxes running into ground?		☐ Yes	☐ No
	iii) Conduits from power poles running into ground?		☐ Yes	☐ No
	iv) Aboveground boxes or housings or wires in work area?		☐ Yes	☐ No
g)	Underground storage tanks:			
	i) Tank pit present?		☐ Yes	☐ No
	ii) Product lines running to dispensers/buildings?		☐ Yes	☐ No
	iii) Vent present away from tank pit?		☐ Yes	☐ No
h)	Do utilities enter or exit existing structures/buildings?		☐ Yes	☐ No
	If Yes, confirm the utility markings outside of structure/building match up.			
i)	Proposed excavation marked in white?	White	☐ Yes	☐ No
j)	Overhead Utilities/Communication Lines **Look Up**:			
	i) Overhead electrical conduit, pipe chases, cable trays ?		☐ Yes	☐ No
	ii) Overhead fire sprinkler system?		☐ Yes	☐ No
	iii) Other overhead lines/utilities, product lines, AC condenser lines?		☐ Yes	☐ No
k)	Aboveground Power lines in or near the work area:			
	i) < 50 kV within 10 ft. of work area?		☐ Yes	☐ No
	ii) >50 - 200 kV within 15 ft. of work area?		☐ Yes	☐ No
	iii) >200-350 kV within 20 ft. of work area?		☐ Yes	☐ No
	iv) >350-500 kV within 25 ft. of work area?		☐ Yes	☐ No
	v) >500-750 kV within 35 ft. or work area?		☐ Yes	☐ No
	vi) >750-1000 kV within 45 ft. of work area?		☐ Yes	☐ No
l)	Other:			
	i) Evidence of linear asphalt or concrete repair?		☐ Yes	☐ No
	ii) Evidence of linear ground subsidence or change in vegetation?		☐ Yes	☐ No
	iii) Unmarked manholes or valve covers in work area?		☐ Yes	☐ No
	iv) Warning signs ("Call Before you Dig", etc.) on or adjacent to site?		☐ Yes	☐ No
	v) Utility color markings not illustrated in this checklist?		☐ Yes	☐ No

Do not initiate intrusive work if utilities are suspected to be present in area and are not located, if markings are over 14 days old, or if clearance methods provide incomplete or conflicting information. Do not perform intrusive work within 30 inches of a utility marking without receiving pre-approval by Corporate H&S .

Name and Signature of person completing the checklist: _____

Date: _____ _____

APPENDIX D

Example Safety Data Sheets

Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Isopropyl Alcohol
ISO5300

Issue Date: 2006-06

Section 1 - Chemical Product and Company Identification 61

Material Name: Isopropyl Alcohol **CAS Number:** 67-63-0
Chemical Formula: C_3H_8O
Structural Chemical Formula: $(CH_3)_2CHOH$
EINECS Number: 200-661-7
ACX Number: X1001458-1
Synonyms: ALCOJEL; ALCOOL ISOPROPILICO; ALCOOL ISOPROPYLIQUE; ALCOSOLVE; ALCOSOLVE 2; AVANTIN; AVANTINE; CHROMAR; COMBI-SCHUTZ; (COMPONENT OF) HIBISTAT; DIMETHYL CARBINOL; DIMETHYLCARBINOL; EPA PESTICIDE CHEMICAL CODE 047501; HARTOSOL; 2-HYDROXYPROPANE; IMSOL A; IPA; ISOHOL; ISOPROPANOL; ISOPROPYL ALCOHOL; ISO-PROPYLALKOHOL; LUTOSOL; 1-METHYLETHANOL; 1-METHYLETHYL ALCOHOL; PETROHOL; PRO; 2-PROPANOL; I-PROPANOL; N-PROPAN-2-OL; PROPAN-2-OL; PROPOL; 2-PROPYL ALCOHOL; I-PROPYL ALCOHOL; SEC-PROPYL ALCOHOL; I-PROPYLALKOHOL; SECONDARY PROPYL ALCOHOL; SPECTRAR; STERISOL HAND DISINFECTANT; TAKINEOCOL; VISCO 1152
Derivation: Treating propylene with sulfuric acid and then hydrolyzing or direct hydration of propylene using superheated steam. Most commonly available as rubbing alcohol (70% IPA).
General Use: As a solvent for gums, shellac, and essential oils, chemical intermediate, dehydrating agent, vehicle for germicidal compounds, de-icing agent for liquid fuels; for denaturing ethyl alcohol, preserving pathological specimens; in extraction of alkaloids, quick-drying inks and oils, and an ingredient of skin lotions, cosmetics, window cleaner, liquid soaps, and pharmaceuticals.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
Isopropyl alcohol	67-63-0	100% vol.

Most commonly sold as 70% isopropyl alcohol (rubbing alcohol).

OSHA PEL
TWA: 400 ppm; 980 mg/m^3.

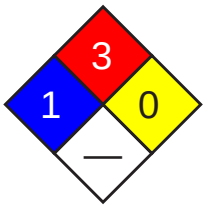
NIOSH REL
TWA: 400 ppm (980 mg/m^3); STEL: 500 ppm (1225 mg/m^3).

DFG (Germany) MAK
TWA: 200 ppm; PEAK: 400 ppm.

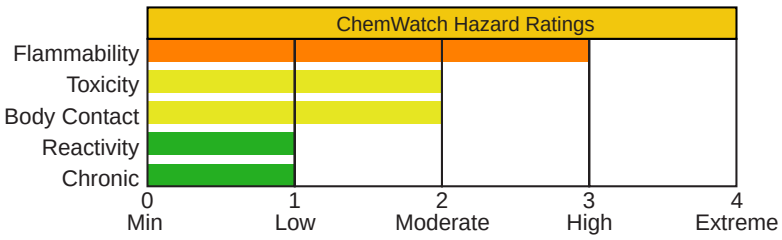
ACGIH TLV
TWA: 200 ppm; STEL: 400 ppm.

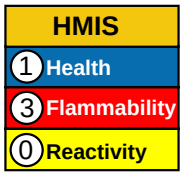
IDLH Level
2000 ppm (10% LEL).

Section 3 - Hazards Identification



Fire Diamond





ANSI Signal Word

Warning!


Flammable

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Volatile liquid. Irritating to eyes/respiratory tract. Other Acute Effects: CNS depression, possible dermatitis, systemic toxicity. Flammable

Potential Health Effects

Target Organs: Eyes, skin, respiratory system.
Primary Entry Routes: Inhalation, ingestion, skin contact/absorption.

Acute Effects

Inhalation: Vapor inhalation is irritating to the respiratory tract and can cause central nervous system depression at high concentrations. Volunteers exposed to 400 ppm for 3 to 5 min experienced mild eye and respiratory irritation. At 800 ppm, irritation was not severe, but most people found the air uncomfortable to breathe.

Eye: Exposure to the vapor or direct contact with the liquid causes irritation and possible corneal burns.

Skin: Some irritation may occur after prolonged exposure.

Ingestion: Accidental ingestions have provided the most information on isopropyl alcohol toxicity. Symptoms include nausea and vomiting, headache, facial flushing, dizziness, lowered blood pressure, mental depression, hallucinations and distorted perceptions, difficulty breathing, respiratory depression, stupor, unconsciousness, and coma. Kidney insufficiency including oliguria (reduced urine excretion), anuria (absent urine excretion), nitrogen retention, and edema (fluid build-up in tissues) may occur. One post-mortem examination in a case of heavy ingestion showed extensive hemorrhagic tracheobronchitis, broncho pneumonia, and hemorrhagic pulmonary edema. Death can occur in 24 to 36 h post-ingestion due to respiratory paralysis.

Carcinogenicity: NTP - Not listed; IARC - Group 3, Not classifiable as to carcinogenicity to humans; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.

Medical Conditions Aggravated by Long-Term Exposure: Dermatitis or respiratory or kidney disorders.

Chronic Effects: Repeated skin contact can cause drying of skin and delayed hypersensitivity reactions in some individuals.

Section 4 - First Aid Measures

See DOT ERG

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Eye Contact: *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.

Skin Contact: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. For reddened or blistered skin, consult a physician.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have the *conscious and alert* person drink 1 to 2 glasses of water to dilute. Vomiting may be contraindicated because of the rapid onset of central nervous system depression. Gastric lavage is preferred.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Diagnostic test: acetone in urine. Isopropyl alcohol is oxidized in the body to acetone where it is excreted by the lungs or kidneys. Some acetone may be further metabolized to acetate, formate, and finally carbon dioxide. Probable oral lethal dose is 240 mL.

Section 5 - Fire-Fighting Measures

See DOT ERG

Flash Point: 53 °F (12 °C), Closed Cup

Burning Rate: 2.3 mm/min.

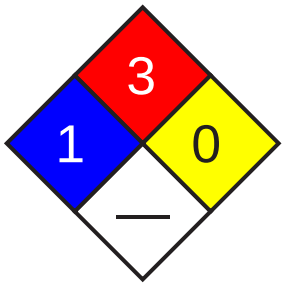
Autoignition Temperature: 750°F (399°C)

LEL: 2 % v/v

UEL: 12.7 % v/v at 200 °F

Flammability Classification: Class 1B Flammable Liquid

Extinguishing Media: Carbon dioxide, dry chemical, water *spray* (solid streams can spread fire), alcohol- resistant foam, or fog.



Fire Diamond

General Fire Hazards/Hazardous Combustion Products: Carbon oxides and acrid smoke. Container may explode in heat of fire. Vapors may travel to an ignition source and flash back. Isopropyl alcohol poses an explosion hazard indoors, outdoors, and in sewers.

Fire-Fighting Instructions: If possible without risk, move container from fire area. Apply cooling water to container side until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use monitor nozzles or unmanned hose holders; if impossible, withdraw and let fire burn. Withdraw immediately if you hear a rising sound from venting safety device or notice any tank discoloration due to fire. *Do not* release runoff from fire control methods to sewers or waterways. Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Structural firefighters' protective clothing provides only limited protection.

Section 6 - Accidental Release Measures

See DOT ERG

Spill/Leak Procedures: Notify safety personnel, isolate and ventilate area, deny entry, and stay upwind. Shut off ignition sources. Cleanup personnel should protect against vapor inhalation and skin/eye contact. Water spray may reduce vapor, but may not prevent ignition in closed spaces.

Small Spills: Take up with earth, sand, vermiculite, or other absorbent, noncombustible material and place in suitable containers.

Large Spills: For large spills, dike far ahead of liquid spill for later disposal. Do not release into sewers or waterways.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Use non-sparking tools to open containers.
Never eat, drink, or smoke in work areas. Practice good personal hygiene after using isopropyl alcohol, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Recommended Storage Methods: Store in a cool, dry, well-ventilated area away from heat, ignition sources, and incompatibles (Sec 10). Install electrical equipment of Class 1, Group D.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: To prevent static sparks, electrically ground and bond all equipment used with and around IPA. Provide general or local exhaust ventilation systems to maintain airborne levels below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls: Consider preplacement and periodic medical exams of exposed workers with emphasis on the skin, kidneys, and respiratory system. Be extra cautious when using IPA concurrently with carbon tetrachloride because animal studies have shown it enhances carbon tetrachloride's toxicity.

Personal Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Nitrile rubber (breakthrough time > 8 hr), Neoprene and Teflon (breakthrough time > 4 hr) are suitable materials for PPE. Do not use PVA, PVC or natural rubber (breakthrough time < 1 hr). Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy.

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. For < 1000 ppm, use any powered, air purifying respirator with organic vapor cartridges or any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s). For < 10,000 ppm, use any supplied-air respirator (SAR) operated in continuous-flow mode. For < 12,000 ppm, use any air- purifying, full facepiece respirator (gas mask) with a chin-style, front-or back-mounted organic vapor canister or any SCBA or SAR with a full facepiece. For emergency or entrance into unknown concentrations, use any SCBA or SAR (with auxiliary SCBA) with a full facepiece and operated in pressure-demand or other positive-pressure mode. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Other: Separate contaminated work clothes from street clothes. Launder before reuse. Remove isopropyl alcohol from your shoes and clean personal protective equipment. Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Colorless with a slight odor and bitter taste.

Physical State: Liquid
Odor Threshold: 7.84 to 490 mg/m^3
Vapor Pressure (kPa): 44 mm Hg at 25 °F (77 °C)
Formula Weight: 60.09
Density: 0.78505 at 68°F (20 °C)
Refractive Index: 1.375 at 68 °F (20 °C)
Boiling Point: 180.5 °F (82.5 °C)
Freezing/Melting Point: -129.1 °F (-89.5 °C)
Viscosity: 2.1 cP at 77 °F (25 °C)
Surface Tension: 20.8 dyne/cm at 77 °F (25 °C)
Ionization Potential (eV): 10.10 eV
Critical Temperature: 455 °F (235 °C)
Critical Pressure: 47 atm
Water Solubility: > 10 %
Other Solubilities: Soluble in alcohol, ether, chloroform, and benzene. Insoluble in salt solutions.

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Isopropyl alcohol is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization does not occur. Exposure to heat, ignition sources, and incompatibles.

Storage Incompatibilities: Include acetaldehyde, chlorine, ethylene oxide, acids and isocyanates, hydrogen + palladium, nitroform, oleum, phosgene, potassium *t*-butoxide, oxygen (forms unstable peroxides), trinitromethane, barium perchlorate, tetrafluoroborate, chromium trioxide, sodium dichromate + sulfuric acid, aluminum, aluminum triisopropoxide, and oxidizers. Will attack some forms of plastic, rubber, and coatings.

Hazardous Decomposition Products: Thermal oxidative decomposition of isopropyl alcohol can produce carbon oxides and acrid smoke.

Section 11 - Toxicological Information

Acute Oral Effects:

Rat, oral, LD_{50}: 5045 mg/kg caused a change in righting reflex, and somnolence (general depressed activity).

Human, oral, TD_{Lo}: 223 mg/kg caused hallucinations, distorted perceptions, lowered blood pressure, and a change in pulse rate.

Human, oral, LD_{Lo}: 3570 mg/kg caused coma, respiratory depression, nausea, and vomiting.

Irritation Effects:

Rabbit, eye: 100 mg caused severe irritation.

Rabbit, skin: 500 mg caused mild irritation.

Other Effects:

Rat, inhalation: 3500 ppm/7 hr given from 1 to 19 days of pregnancy caused fetotoxicity.

See *RTECS* NT8050000, for additional data.

Section 12 - Ecological Information

Environmental Fate: On soil, IPA will volatilize or leach into groundwater. Biodegradation is possible but rates are not found in available literature. It will volatilize (est. half-life = 5.4 days) or biodegrade in water. It is not expected to bioconcentrate in fish. In the air, it reacts with photochemically produced hydroxyl radicals with a half-life of one to several days. Because it is soluble, removal by rain, snow or other precipitation is possible.

Ecotoxicity: Guppies (*Poecilia reticulata*) LC_{50} = 7,060 ppm/7 days; fathead minnow (*Pimephales promelas*) LC_{50} = 11,830 mg/L/1 hr. BOD = 133 %/5 days.

Octanol/Water Partition Coefficient: log K_{ow} = 0.05

Section 13 - Disposal Considerations

Disposal: Microbial degradation is possible by oxidizing isopropyl alcohol to acetone by members of the genus *Desulfovibrio*. Spray waste into incinerator (permit-approved facilities only) equipped with an afterburner and scrubber. Isopropyl alcohol can be settled out of water spills by salting with sodium chloride. Note: Salt may harm aquatic life, so weigh the benefits against possible harm before application. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations. Triple rinse containers.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Shipping Name and Description: Isopropanol *or* Isopropyl alcohol
ID: UN1219
Hazard Class: 3 - Flammable and combustible liquid
Packing Group: II - Medium Danger
Symbols:
Label Codes: 3 - Flammable Liquid
Special Provisions: IB2, T4, TP1
Packaging: **Exceptions:** 150 **Non-bulk:** 202 **Bulk:** 242
Quantity Limitations: **Passenger aircraft/rail:** 5 L **Cargo aircraft only:** 60 L
Vessel Stowage: **Location:** B **Other:**

Section 15 - Regulatory Information

EPA Regulations:

RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Not listed
SARA 40 CFR 372.65: Listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Group, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Issue Date: 2006-06

Section 1 - Chemical Product and Company Identification 61

Material Name: Isobutene **CAS Number:** 115-11-7
Chemical Formula: C_4H_8
Structural Chemical Formula: $(CH_3)_2C=CH_2$
EINECS Number: 204-066-3
ACX Number: X1003822-9
Synonyms: Isobutene; ISOBUTYLENE; ASYM-DIMETHYLETHYLENE; GAMMA-BUTYLENE; 1,1-DIMETHYLETHYLENE; ISO-BUTENE; ISOBUTENE; ISOPROPYLIDENEMETHYLENE; LIQUEFIED PETROLEUM GAS; 2-METHYL-1-PROPENE; 2-METHYLPROPENE; 2-METHYLPROPYLENE; 1-PROPENE,2-METHYL-; PROPENE,2-METHYL-; UNSYM. DIMETHYLETHYLENE
General Use: Production of butene polymers used as adhesives, tackifiers, oil additives.
Butyl rubbers, copolymer resins with butadiene, acrylates and methacrylates.
Also to produce anti-oxidants for foods, food supplements, plastics and in production of isooctane and high-octane aviation gasoline.
Used in closed pressurized systems, fitted with safety relief valve.
Vented gas is flammable, denser than air and will spread. Vent path must not contain ignition sources, pilot lights, bare flames.

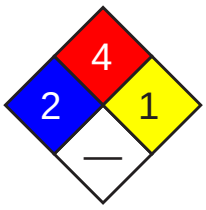
Section 2 - Composition / Information on Ingredients

Name	CAS	%
isobutene	115-11-7	>99

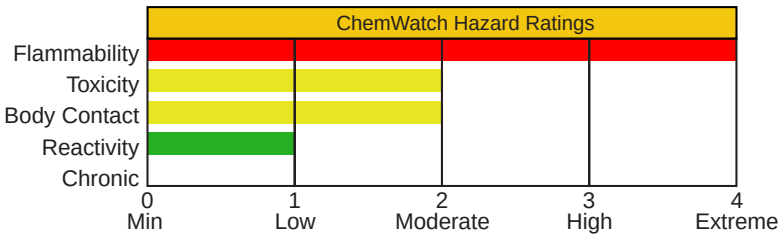
OSHA PEL **NIOSH REL**

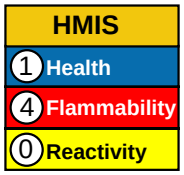
ACGIH TLV

Section 3 - Hazards Identification



Fire Diamond





ANSI Signal Word

Danger!


Flammable

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Colorless gas. Acute Effects: Simple asphyxiant which can displace available oxygen; initial symptoms: rapid respiration, air hunger, diminished mental alertness, impaired muscular coordination. Can form explosive mixtures in air. Flammable.

Potential Health Effects

Target Organs: None reported
Primary Entry Routes: inhalation
Acute Effects
Inhalation: The gas is a simple asphyxiant (precludes access to oxygen) and is harmful if exposure is prolonged and inhalation may cause loss of consciousness.

Acute effects from inhalation of high concentrations of gas / vapor are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterized by headache and dizziness, increased reaction time, fatigue and loss of coordination.
If exposure to highly concentrated atmosphere of gas is prolonged this may lead to narcosis, unconsciousness, even coma, and unless resuscitated, death.
Iso-butene is a simple asphyxiant and may have a narcotic action.
Material is highly volatile and may quickly form concentrated atmosphere in confined or unventilated area. Vapor is heavier than air and may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.
Hydrocarbons may sensitize the heart to adrenalin and other circulatory catecholamines; as a result cardiac arrhythmias and ventricular fibrillation may occur. Abrupt collapse may produce traumatic injury.
Central nervous system (CNS) depression may be evident early. Symptoms of moderate poisoning may include giddiness, headache, dizziness and nausea.
Serious poisonings may result in respiratory depression and may be fatal.
The paraffin gases C1-4 are practically non-toxic below their lower flammability limits (18000-50000 ppm). Above this level, incidental effects include CNS depression and irritation but these are reversible upon cessation of the exposure. The C3 and iso-C5 hydrocarbons show increasing narcotic properties; branching of the chain also enhances the effect.
The C4 hydrocarbons appear to be more highly neurotoxic than the C3 and C5 members. Several fatalities due to voluntary inhalation of butane have been reported, possibly due to central, respiratory and circulatory effects resulting from anesthesia, laryngeal edema, chemical pneumonia or the combined effects of cardiac toxicity and increased sympathomimetic effects.
Inhalation of petroleum gases may produce narcosis, due in part to olefinic impurities. Displacement of oxygen in the air may cyanosis.
If present in sufficient quantity these gases may reduce the oxygen level to below 18% producing asphyxiation.
Symptoms include rapid respiration, mental dullness, lack of coordination, poor judgement, nausea and vomiting.
The onset of cyanosis may lead to unconsciousness and death.

Eye: The liquid is highly discomforting and may cause severe cold burns and is capable of causing pain and severe conjunctivitis.
Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.
The gas is regarded as non-irritating to the eyes.

Skin: Vaporizing liquid causes rapid cooling and contact may cause cold burns, frostbite.The liquid is discomforting to the skin and may rapidly cause severe cold burns.
Bare unprotected skin should not be exposed to this material.
There is no evidence of skin absorption but contact may cause frostbite,

Ingestion: Overexposure is unlikely in this form.
Considered an unlikely route of entry in commercial/industrial environments.
The liquid is highly discomforting if swallowed and may cause severe cold burns.

Carcinogenicity: NTP - Not listed; IARC - Not listed; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.

Chronic Effects: Chronic overexposure may produce dermatitis.

Section 4 - First Aid Measures

Inhalation: Avoid becoming a casualty and remove to fresh air.
Lay patient down. If breathing is shallow or has stopped, ensure clear airway and apply resuscitation.
If available, medical oxygen should be administered by trained personnel.
Transport to hospital or doctor, without delay.

Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.
Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: In case of cold burns (frost-bite): Bathe the affected area immediately in cold water for 10 to 15 minutes, immersing if possible and without rubbing.
Do not apply hot water or radiant heat. Apply a clean, dry dressing.
Transport to hospital or doctor.

Ingestion: Contact a Poison Control Center. DO NOT induce vomiting. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. Give water (or milk) to rinse out mouth. Then provide liquid slowly and as much as casualty can comfortably drink. Transport to hospital or doctor without delay.

After first aid, get appropriate in-plant, paramedic, or community medical support.

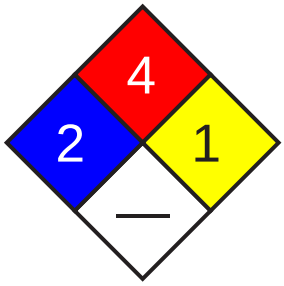
Note to Physicians: For acute or short-term repeated exposures to petroleum distillates or related hydrocarbons:
1.Primary threat to life from pure petroleum distillate ingestion and/or inhalation is respiratory failure.

2.Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO_2 <50 mm Hg or pCO_2 >50 mm Hg) should be intubated.
3.Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
4.A chest x-ray should be taken immediately after stabilization of breathing and circulation to document aspiration and detect the presence of pneumothorax.
5.Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitization to catecholamines.
Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
6.Lavage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients.

Section 5 - Fire-Fighting Measures

Flash Point: -76.111 °C
Autoignition Temperature: 465 °C
LEL: 1.8% v/v
UEL: 9.6% v/v
Extinguishing Media: Water spray or fog; dry chemical powder.
Carbon dioxide.
Foam.

See DOT ERG



Fire Diamond

General Fire Hazards/Hazardous Combustion Products: Flammable gas. Liquid and vapor are highly flammable.
Dangerous hazard when exposed to heat, flame and oxidizers.
Gas may form explosive mixtures with air over a wide area.
Decomposes on heating and produces toxic fumes of carbon monoxide (CO) and carbon dioxide (CO_2).
Fire Incompatibility: Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.
Fire-Fighting Instructions: Contact fire department and tell them location and nature of hazard.
May be violently or explosively reactive. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways. Consider evacuation.
Do not extinguish burning gas. If safe to do so, stop flow of gas.
If flow of gas cannot be stopped, leave gas to burn.
Cool fire-exposed containers with water spray from a protected location.
Do not approach cylinders suspected to be hot.
If safe to do so, remove containers from path of fire.
Fight fire from a safe distance, with adequate cover.

Section 6 - Accidental Release Measures

Small Spills: Avoid breathing vapor and any contact with liquid or gas. Protective equipment including respirator should be used. Do NOT enter confined spaces where gas may have accumulated. Shut of all sources of possible ignition and increase ventilation. Clear area of personnel. Stop leak only if safe to so do. Remove leaking cylinders to safe place. Release pressure under safe controlled conditions by opening valve. Keep area clear of personnel until gas has dispersed.

See DOT ERG

Large Spills: DO NOT touch the spill material. Shut off all possible sources of ignition and increase ventilation. Restrict access to area. Clear area of personnel and move upwind.
May be violently or explosively reactive. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways. Consider evacuation.
Avoid spraying water onto liquid pools.
Use extreme caution to avoid a violent reaction.
Stop leak if safe to do so.
DO NOT enter confined places where gas may have collected. Remove leaking cylinders to a safe place. Fit vent pipes. Release pressure under safe, controlled conditions by opening valve. Burn issuing gas at vent pipes.
Do not exert excessive pressure on valve; do not attempt to operate damaged valve.
Keep area clear of personnel until gas has dispersed
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Use good occupational work practices. Use in a well-ventilated area.

Obtain a work permit before attempting any repairs.
Do not attempt repair work on lines, vessels under pressure.
Atmospheres must be tested and O.K. before work resumes after leakage.
Wear protective clothing and gloves when handling containers.
No smoking, bare lights, heat or ignition sources.
Use spark-free tools when handling. Ground all lines and equipment.
Prevent concentration in hollows and sumps. DO NOT enter confined spaces until atmosphere has been checked.
Gas may travel a considerable distance to source of ignition.
Vapor may ignite on pumping or pouring due to static electricity.
Avoid physical damage to containers.
DO NOT transfer gas from one cylinder to another.
Natural gases contain a contaminant, radon-222, a naturally occurring radioactive gas. During subsequent processing, radon tends to concentrate in liquified petroleum streams and in product streams having similar boiling points.
Industry experience indicates that the commercial product may contain small amounts of radon-222 and its radioactive decay products (radon daughters). The actual concentration of radon-222 and radioactive daughters in process equipment (IE lines, filters, pumps and reactor units) may reach significant levels and produce potentially damaging levels of gamma radiation. A potential external radiation hazard exists at or near any pipe, valve or vessel containing a radon enriched stream or containing internal deposits of radioactive material. Field studies, however, have not shown that conditions exist that expose the worker to cumulative exposures in excess of general population limits. Equipment containing gamma-emitting decay products should be presumed to be internally contaminated with alpha- emitting decay products which may be hazardous if inhaled or ingested.
During maintenance operations that require the opening of contaminated process equipment, the flow of gas should be stopped and a four hour delay enforced to allow gamma-radiation to drop to background levels. Protective equipment (including high efficiency particulate respirators (P3) suitable for radionucleotides or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination or inhalation of any residue containing alpha-radiation.
Airborne contamination may be minimized by handling scale and/or contaminated materials in a wet state.

Recommended Storage Methods: Packaging as recommended by manufacturer.
Check that containers are clearly labeled.
Cylinder fitted with valve protector cap.
Ensure the use of equipment rated for cylinder pressure.
Ensure the use of compatible materials of construction.
Cylinder valve must be closed when not in use or when empty.
Cylinder must be properly secured either in use or in storage.
WARNING: Suckback into cylinder may result in rupture.
Use back-flow preventive device in piping.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use in a well-ventilated areaIf gas concentrations are high: or If risk of overexposure exists, wear NIOSH-approved respirator.
Correct fit is essential to obtain adequate protection.
Used in closed pressurized systems; fitted with temperature and pressure safety relief valves which are vented to allow safe dispersal.
Provide adequate ventilation in warehouse or closed storage areas.

Personal Protective Clothing/Equipment:

Eyes: Safety glasses with side shields; or as required, chemical goggles.
Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Protective gloves eg. leather gloves or gloves with leather facing. Neoprene rubber gloves.
Safety footwear.

Other: Operators should be trained in correct use & maintenance of respirators Ensure that there is ready access to breathing apparatus.
Protective overalls, closely fitted at neck and wrist. Eye-wash unit.
IN CONFINED SPACES:
1. Non-sparking protective boots.
2. Static-free clothing.
3. Ensure availability of lifeline.
Staff should be trained in all aspects of rescue work.
Ensure there is ready access to an emergency shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Easily liquified flammable gas or colorless highly volatile liquid. Packed as liquid under pressure and remains liquid only under pressure. Sudden release of pressure or leakage may result in rapid vaporization with generation of large volume of highly flammable / explosive gas. Strong gasoline odor. Floats and boils on water giving a flammable / explosive, visible cloud. Soluble in alcohol, ether, benzene and sulphuric acid.

Physical State: Liquefied gas
Odor Threshold: 1.3 to 3.0 mg/m^3
Vapor Pressure (kPa): 182 kPa at 10 °C
Vapor Density (Air=1): 2.01
Formula Weight: 56.11
Specific Gravity (H_2O=1, at 4 °C): 0.59
Evaporation Rate: Very rapid
pH: Not applicable
pH (1% Solution): Not applicable.
Boiling Point: -6.9 °C (20 °F)
Freezing/Melting Point: -140.35 °C (-220.63 °F)
Volatile Component (% Vol): 100
Water Solubility: Practically insoluble in water

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Product is considered stable. Hazardous polymerization will not occur.
Storage Incompatibilities: Avoid contact with oxidizing agents.

The interaction of alkenes and alkynes with nitrogen oxides and oxygen may produce explosive addition products; these may form at very low temperatures and explode on heating to higher temperatures (the addition products from 1,3-butadiene and cyclopentadiene form rapidly at -150 °C and ignite or explode on warming to -35 to -15 C). These derivatives ("pseudo- nitrosites") were formerly used to characterize terpene hydrocarbons.

Exposure to air must be kept to a minimum so as to limit the build-up of peroxides which will concentrate in bottoms if the product is distilled.

The product must not be distilled to dryness if the peroxide concentration is substantially above 10 ppm (as active oxygen) since explosive decomposition may occur. Distillate must be immediately inhibited to prevent peroxide formation. The effectiveness of the antioxidant is limited once the peroxide levels exceed 10 ppm as active oxygen. Addition of more inhibitor at this point is generally ineffective.

Prior to distillation it is recommended that the product should be washed with aqueous ferrous ammonium sulfate to destroy peroxides; the washed product should be immediately re-inhibited.

A range of exothermic decomposition energies for double bonds is given as 40-90 kJ/mol. The relationship between energy of decomposition and processing hazards has been the subject of discussion; it is suggested that values of energy released per unit of mass, rather than on a molar basis (J/g) be used in the assessment. For example, in "open vessel processes" (with man-hole size openings, in an industrial setting), substances with exothermic decomposition energies below 500 J/g are unlikely to present a danger, whilst those in "closed vessel processes" (opening is a safety valve or bursting disk) present some danger where the decomposition energy exceeds 150 J/g.

Avoid reactions with oxidizing agents, organic acids, inorganic acids halogenated compounds, polymerizable esters, oxygen, cyanohydrins and molten sulphur.

Section 11 - Toxicological Information

Toxicity
Inhalation (rat) LC_{50}: 620000 mg/m^3/4h

Irritation
Nil reported

See *RTECS* UD 0890000, for additional data.

Section 12 - Ecological Information

Environmental Fate: No data found.
Ecotoxicity: No data found.
BCF: no food chain concentration potential
Biochemical Oxygen Demand (BOD): none

Section 13 - Disposal Considerations

Disposal: Consult manufacturer for recycling options.
Discharge to burning flare. Return empty cylinders to supplier.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Note: This material has multiple possible HMT entries. Choose the appropriate one based on state and condition of specific material when shipped.

Shipping Name and Description: Isobutylene *see also* Petroleum gases, liquefied
ID: UN1055
Hazard Class: 2.1 - Flammable gas
Packing Group:
Symbols:
Label Codes: 2.1 - Flammable Gas
Special Provisions: 19, T50
Packaging: **Exceptions:** 306 **Non-bulk:** 304 **Bulk:** 314, 315
Quantity Limitations: **Passenger aircraft/rail:** Forbidden **Cargo aircraft only:** 150 kg
Vessel Stowage: **Location:** E **Other:** 40

Shipping Name and Description: Petroleum gases, liquefied *or* Liquefied petroleum gas
ID: UN1075
Hazard Class: 2.1 - Flammable gas
Packing Group:
Symbols:
Label Codes: 2.1 - Flammable Gas
Special Provisions: T50
Packaging: **Exceptions:** 306 **Non-bulk:** 304 **Bulk:** 314, 315
Quantity Limitations: **Passenger aircraft/rail:** Forbidden **Cargo aircraft only:** 150 kg
Vessel Stowage: **Location:** E **Other:**

Section 15 - Regulatory Information

EPA Regulations:

RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Not listed
SARA 40 CFR 372.65: Not listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Group, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Catalog Numbers: CS7000-A, CS7000-B, CS7000-C, CS7000-D, CS7000-P, CS7000-Q, CS7000-G, CS7000-T
Product Identity: Conductivity Std., 7000 umho/cm

Chemical Family: Not Applicable
Synonyms: Not Applicable
Recommended Use: Laboratory chemicals

Manufacturer's Name: AquaPhoenix Scientific, Inc., 9 Barnhart Dr., Hanover, PA 17331, (866) 632-1291
Emergency Contact Number (24hr): Chemtel (800) 255-3924

Issue Date: 01/08/07
Revision Date: 06/05/08, 05/12/10, 02/19/12

Section 2 – Hazard Identification

Emergency Overview: Non-flammable, non-corrosive, non-toxic. Does not present significant health hazards. Wash areas of contact with water.
Appearance: Clear, colorless liquid **Odor:** Odorless
Target Organs: Eyes, skin
Potential Health Effects/ Routes of Exposure:
Eyes: May cause slight irritation.
Skin: May cause slight irritation.
Ingestion: Large doses may cause upset stomach.
Inhalation: Not likely to be a hazard.
Chronic Effect / Carcinogenicity: None (IARC, NTP, OSHA)
Aggravated Medical Conditions No information available
These chemicals are not considered hazardous by OSHA.
See section 11 for toxicological information. See section 12 for potential environmental effects.

Section 3 – Composition, Information on Ingredients

Potassium Chloride, CAS# 7447-40-7, < 0.5% w/v
Water, purified, CAS# 7732-18-5, >99% w/v

Section 4 – First Aid

Eyes: Immediately flush eyes with water for at least 15 minutes. Immediately get medical assistance.
Skin: Flush with water for 15 minutes. Get medical assistance if irritation develops.
Ingestion: DO NOT induce vomiting. Dilute with water or milk. Get medical assistance.
Inhalation: Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
Notes to Physician Treat symptomatically.

Section 5 – Fire Fighting Measures

Flash Point: Not Applicable **Autoignition Temperature** No information available.
Explosion Limits Upper No data available **Lower** No data available
Extinguishing Media: Use means suitable to extinguishing surrounding fire.
Unsuitable Extinguishing Media: No information available
Fire & Explosion Hazards: Not considered to be a fire or explosion hazard.
Fire Fighting Instructions / Equipment: Use normal procedures. Use protective clothing. Use NIOSH-approved breathing equipment.

Hazardous Combustion Products: No information Available
Sensitivity to mechanical impact No information available.
Sensitivity to static discharge No information available.
Specific Hazards Arising from the Chemical: No information available
NFPA Rating: (estimated) Health: 1; Flammable: 0; Reactivity: 0

Section 6 – Accidental Release Measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.
Environmental Precautions Not relevant considering the small amounts used.
Methods for Containment and Clean Up Absorb with suitable material. Always obey local regulations. Always obey local regulations.

Section 7 – Handling and Storage

Handling: Wash hands after handling. Avoid contact with skin and eyes.
Storage: Protect from freezing and physical damage.

Section 8 – Exposure Controls, Personal Protection

Potassium Chloride, CAS# 7447-40-7, ACGIH TLV: NA, OSHA PEL: NA
Water, purified, CAS# 7732-18-5, ACGIH TLV: NA, OSHA PEL: NA

Engineering Measures/ General Hygiene: Normal ventilation is adequate. Ensure eyewash and safety showers are available.
Personal Protection Equipment: Skin Protection: Chemical resistant gloves.
Eye/Face Protection: Safety Glasses or goggles. **Respiratory Protection:** Normal ventilation is adequate

Section 9 – Physical and Chemical Properties

Appearance/Physical State: Clear, colorless liquid
Odor: Odorless
Boiling Point: Approx 100.1C
Melting Point: Approx (-6)-0 C
Vapor Density: No Information Available
Evaporation Rate: No Information Available
pH: Not Available
Flammability: No Information Available
Solubility: Infinite
Relative Density: No Information Available
% Volatility: No Information Available
Specific Gravity: 1-1.01
Vapor Pressure: No Information Available
Flash Point: Not Applicable
Coefficient of water/oil distribution: Not Available
Odor Threshold: Not Available
Decomposition Temperature: No Information Available
Partition Coefficient n-octanol/water: No data available
Molecular Weight: Not available

Section 10 – Stability and Reactivity

Chemical Stability: Stable under normal conditions of use and storage.
Incompatible Materials Strong Oxidizing agents, Lithium, Bromine, Trifluoride.
Conditions to Avoid: No Information Available.
Hazardous Decomposition Products: Oxides of Sodium and fumes of Chloride.
Hazardous Polymerization: Does not occur
Hazardous Reactions: None under normal processing.

Section 11 – Toxicological Information

Routes of Exposure/Symptoms/Corrosiveness – See Section 2
LD50 orl-rat: 3020 mg/kg LC50 inhalation-rat: Not Available
Irritation: No Information Available
Toxicologically Synergistic: No Information Available
Chronic Exposure

Carcinogenicity No Information Available
Sensitization No information available.
Mutagenic Effects No information available.
Reproductive Effects No information available.
Developmental Effects (Immediate/Delayed) No information available.
Teratogenicity No information available.
Other Adverse Effects No Information Available.
Endocrine Disruptor Information No information available

Section 12 – Ecological Information

Ecotoxicity: Not Available.
Persistence and Degradability: No Information Available **Mobility:** No Information Available
Bioaccumulation/ Accumulation: No Information Available

Section 13 – Disposal Considerations

Waste Disposal/Waste Disposal of Packaging: Dilute with water.
All chemical waster generators must determine whether a discarded chemical is classified as hazardous waste. Comply with all local, state, and federal regulations.

Section 14 – Transport Information

DOT - Not Regulated

Section 15 – Regulatory Information (not meant to be all inclusive)

OSHA Status: These chemicals are not considered hazardous by OSHA.
Canada DSL: These chemicals are listed on the Canada DSL list.
TSCA: The components of this solution are listed on the TSCA Inventory
SARA Title III Section 313: Not Applicable
RCRA Status: Not Applicable
CERCLA Reportable Quantity: Not Applicable
WHMIS: Not Applicable.
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR

Section 16 – Additional Information

Disclaimer: The information on this MSDS applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to determine the suitability and completeness of this information for his own particular use. No warranty is implied regarding the accuracy of the data or the results to be obtained from the products use.

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Catalog Numbers: BU5004-A, BU5004-B, BU5004-C, BU5004-D, BU5004-P, BU5004-Q, BU5004-G, BU5004-T

Product Identity: Buffer Solution, pH 4.00

Chemical Family: Not Applicable
Synonyms: Not Applicable
Recommended Use: Laboratory chemicals

Manufacturer's Name: AquaPhoenix Scientific, Inc., 9 Barnhart Dr., Hanover, PA 17331, (866) 632-1291
Emergency Contact Number (24hr): Chemtel (800) 255-3924

Issue Date: 12/28/06
Revision Date: 6/5/08, 02/25/10, 09/14/10, 02/19/12

Section 2 – Hazard Identification

Emergency Overview: Non-flammable, non-corrosive, non-toxic. Does not present significant health hazards. Wash areas of contact with water.
Appearance: Clear, reddish liquid **Odor:** Odorless
Target Organs: Eyes, skin
Potential Health Effects/ Routes of Exposure:
Eyes: May cause slight irritation.
Skin: May cause slight irritation.
Ingestion: May cause diarrhea, nausea, vomiting, and cramps.
Inhalation: Not likely to be a hazard.
Chronic Effect / Carcinogenicity: None (IARC, NTP, OSHA)
Aggravated Medical Conditions No information available
These chemicals are not considered hazardous by OSHA.
See section 11 for toxicological information. See section 12 for potential environmental effects.

Section 3 – Composition, Information on Ingredients

Potassium Acid Phthalate, CAS# 877-24-7, <1% w/v
Water, purified, CAS# 7732-18-5, >98% w/v

Section 4 – First Aid

Eyes: Immediately flush eyes with water for at least 15 minutes. Immediately get medical assistance.
Skin: Flush with water for 15 minutes. Get medical assistance if irritation develops.
Ingestion: DO NOT induce vomiting. Dilute with water or milk. Get medical assistance.
Inhalation: Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
Notes to Physician Treat symptomatically.

Section 5 – Fire Fighting Measures

Flash Point: Not Applicable **Autoignition Temperature** No information available.
Explosion Limits Upper No data available **Lower** No data available
Extinguishing Media: Use means suitable to extinguishing surrounding fire.
Unsuitable Extinguishing Media: No information available
Fire & Explosion Hazards: Not considered to be a fire or explosion hazard.

Fire Fighting Instructions / Equipment: Use normal procedures. Use protective clothing. Use NIOSH-approved breathing equipment.
Hazardous Combustion Products: No information Available
Sensitivity to mechanical impact No information available.
Sensitivity to static discharge No information available.
Specific Hazards Arising from the Chemical: No information available
NFPA Rating: (estimated) Health: 1; Flammable: 0; Reactivity: 0

Section 6 – Accidental Release Measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.
Environmental Precautions No information available.
Methods for Containment and Clean Up Absorb with suitable material. Always obey local regulations.

Section 7 – Handling and Storage

Handling: Wash hands after handling. Avoid contact with skin and eyes.
Storage: Protect from freezing and physical damage.

Section 8 – Exposure Controls, Personal Protection

Potassium Acid Phthalate, CAS# 877-24-7, ACGIH TLV: NA, OSHA PEL: NA
Water, purified, CAS# 7732-18-5, ACGIH TLV: NA, OSHA PEL: NA

Engineering Measures/ General Hygiene: Normal ventilation is adequate. Ensure eyewash and safety showers are available.
Personal Protection Equipment: Skin Protection: Chemical resistant gloves.
Eye/Face Protection: Safety Glasses or goggles. **Respiratory Protection:** Normal ventilation is adequate

Section 9 – Physical and Chemical Properties

Appearance/Physical State: Clear, reddish liquid

Odor: Odorless	**% Volatility:** No Information Available
Boiling Point: Approx 100C	**Specific Gravity:** Approx 1
Melting Point: Approx 0 C	**Vapor Pressure:** No Information Available
Vapor Density: No Information Available	**Flash Point:** Not Applicable
Evaporation Rate: No Information Available	**Coefficient of water/oil distribution:** Not Available
pH: 4.0	**Odor Threshold:** Not Available
Flammability: No Information Available	**Decomposition Temperature:** No Information Available
Solubility: Infinite	**Partition Coefficient n-octanol/water:** No data available
Relative Density: No Information Available	**Molecular Weight:** Not available

Section 10 – Stability and Reactivity

Chemical Stability: Stable under normal conditions of use and storage.
Incompatible Materials Nitric Acid.
Conditions to Avoid: No Information Available.
Hazardous Decomposition Products: Oxides of potassium and carbon.
Hazardous Polymerization: Does not occur
Hazardous Reactions: None under normal processing.

Section 11 – Toxicological Information

Routes of Exposure/Symptoms/Corrosiveness – See Section 2
LD50 orl-rat: 3200 mg/kg (Potassium Acid Phthalate) LC50 inhalation-rat: NA
Irritation: No Information Available
Toxicologically Synergistic: No Information Available

Chronic Exposure
Carcinogenicity No Information Available
Sensitization No information available.
Mutagenic Effects No information available.
Reproductive Effects No information available.
Developmental Effects (Immediate/Delayed) No information available.
Teratogenicity No information available.
Other Adverse Effects No Information Available.
Endocrine Disruptor Information No information available

Section 12 – Ecological Information

Ecotoxicity: Not Available.
Persistence and Degradability: No Information Available **Mobility:** No Information Available
Bioaccumulation/ Accumulation: No Information Available

Section 13 – Disposal Considerations

Waste Disposal/Waste Disposal of Packaging: Dilute with water.
All chemical waster generators must determine whether a discarded chemical is classified as hazardous waste. Comply with all local, state, and federal regulations.

Section 14 – Transport Information

DOT - Not Regulated

Section 15 – Regulatory Information (not meant to be all inclusive)

OSHA Status: These chemicals are not considered hazardous by OSHA.
Canada DSL: These chemicals are listed on Canada's DSL list.
TSCA: The components of this solution are listed on the TSCA Inventory
SARA Title III Section 313: Not Applicable
RCRA Status: Not Applicable
CERCLA Reportable Quantity: Not Applicable
WHMIS: Not Applicable.
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR

Section 16 – Additional Information

Disclaimer: The information on this MSDS applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to determine the suitability and completeness of this information for his own particular use. No warranty is implied regarding the accuracy of the data or the results to be obtained from the products use.

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Catalog Numbers: BU5010-A, BU5010-B, BU5010-C, BU5010-D, BU5010-P, BU5010-Q, BU5010-G, BU5010-T

Product Identity: Buffer Solution, pH 10.00

Chemical Family: Not Applicable
Synonyms: Not Applicable
Recommended Use: Laboratory chemicals

Manufacturer's Name: AquaPhoenix Scientific, Inc., 9 Barnhart Dr., Hanover, PA 17331, (866) 632-1291
Emergency Contact Number (24hr): Chemtel (800) 255-3924

Issue Date: 12/28/06
Revision Date: 6/5/08, 06/03/10, 02/19/12

Section 2 – Hazard Identification

Emergency Overview: Non-flammable, non-corrosive, non-toxic. Does not present significant health hazards. Wash areas of contact with water.
Appearance: Clear, blue liquid **Odor:** Odorless
Target Organs: Eyes, skin
Potential Health Effects/ Routes of Exposure:
Eyes: May cause slight irritation.
Skin: May cause slight irritation.
Ingestion: May cause diarrhea, nausea, vomiting, and cramps.
Inhalation: Not likely to be a hazard.
Chronic Effect / Carcinogenicity: None (IARC, NTP, OSHA)
Aggravated Medical Conditions No information available
These chemicals are not considered hazardous by OSHA.
See section 11 for toxicological information. See section 12 for potential environmental effects.

Section 3 – Composition, Information on Ingredients

Sodium Bicarbonate, CAS# 144-55-8, <0.5% w/v
Sodium Carbonate, CAS# 497-19-8, <0.5% w/v
Water, purified, CAS# 7732-18-5, >99% w/v

Section 4 – First Aid

Eyes: Immediately flush eyes with water for at least 15 minutes. Immediately get medical assistance.
Skin: Flush with water for 15 minutes. Get medical assistance if irritation develops.
Ingestion: DO NOT induce vomiting. Dilute with water or milk. Get medical assistance.
Inhalation: Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
Notes to Physician Treat symptomatically.

Section 5 – Fire Fighting Measures

Flash Point: Not Applicable **Autoignition Temperature** No information available.
Explosion Limits Upper No data available **Lower** No data available
Extinguishing Media: Use means suitable to extinguishing surrounding fire.
Unsuitable Extinguishing Media: No information available
Fire & Explosion Hazards: Not considered to be a fire or explosion hazard.

Fire Fighting Instructions / Equipment: Use normal procedures. Use protective clothing. Use NIOSH-approved breathing equipment.
Hazardous Combustion Products: No information Available
Sensitivity to mechanical impact No information available.
Sensitivity to static discharge No information available.
Specific Hazards Arising from the Chemical: No information available
NFPA Rating: (estimated) Health: 1; Flammable: 0; Reactivity: 0

Section 6 – Accidental Release Measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.
Environmental Precautions No information available.
Methods for Containment and Clean Up Absorb with suitable material. Always obey local regulations.

Section 7 – Handling and Storage

Handling: Wash hands after handling. Avoid contact with skin and eyes.
Storage: Protect from freezing and physical damage.

Section 8 – Exposure Controls, Personal Protection

Sodium Bicarbonate, CAS# 144-55-8, ACGIH TLV: NA, OSHA PEL: NA
Sodium Carbonate, CAS# 497-19-8, ACGIH TLV: NA, OSHA PEL: NA
Water, purified, CAS# 7732-18-5, ACGIH TLV: NA, OSHA PEL: NA

Engineering Measures/ General Hygiene: Normal ventilation is adequate. Ensure eyewash and safety showers are available.
Personal Protection Equipment: Skin Protection: Chemical resistant gloves.
Eye/Face Protection: Safety Glasses or goggles. **Respiratory Protection:** Normal ventilation is adequate

Section 9 – Physical and Chemical Properties

Appearance/Physical State: Clear, blue liquid

Odor: Odorless
Boiling Point: Approx 100C
Melting Point: Approx 0 C
Vapor Density: No Information Available
Evaporation Rate: No Information Available
pH: 10.0
Flammability: No Information Available
Solubility: Infinite
Relative Density: No Information Available

% Volatility: No Information Available
Specific Gravity: Approx 1
Vapor Pressure: No Information Available
Flash Point: Not Applicable
Coefficient of water/oil distribution: Not Available
Odor Threshold: Not Available
Decomposition Temperature: No Information Available
Partition Coefficient n-octanol/water: No data available
Molecular Weight: Not available

Section 10 – Stability and Reactivity

Chemical Stability: Stable under normal conditions of use and storage.
Incompatible Materials None identified.
Conditions to Avoid: No Information Available.
Hazardous Decomposition Products: Oxides of sodium.
Hazardous Polymerization: Does not occur
Hazardous Reactions: None under normal processing.

Section 11 – Toxicological Information

Routes of Exposure/Symptoms/Corrosiveness – See Section 2
LD50 orl-rat: 4090 mg/kg (Sodium Carbonate), 4220 mg/kg (Sodium Bicarbonate) LC50 inhalation-rat: NA
Irritation: No Information Available

Toxicologically Synergistic: No Information Available
Chronic Exposure
Carcinogenicity No Information Available
Sensitization No information available.
Mutagenic Effects No information available.
Reproductive Effects No information available.
Developmental Effects (Immediate/Delayed) No information available.
Teratogenicity No information available.
Other Adverse Effects No Information Available.
Endocrine Disruptor Information No information available

Section 12 – Ecological Information

Ecotoxicity: Not Available.
Persistence and Degradability: No Information Available **Mobility:** No Information Available
Bioaccumulation/ Accumulation: No Information Available

Section 13 – Disposal Considerations

Waste Disposal/Waste Disposal of Packaging: Dilute with water.
All chemical waster generators must determine whether a discarded chemical is classified as hazardous waste. Comply with all local, state, and federal regulations.

Section 14 – Transport Information

DOT - Not Regulated

Section 15 – Regulatory Information (not meant to be all inclusive)

OSHA Status: These chemicals are not considered hazardous by OSHA.
Canada DSL: These chemicals are listed on Canada's DSL list.
TSCA: The components of this solution are listed on the TSCA Inventory
SARA Title III Section 313: Not Applicable
RCRA Status: Not Applicable
CERCLA Reportable Quantity: None Reported
WHMIS: Not Applicable.
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR

Section 16 – Additional Information

Disclaimer: The information on this MSDS applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to determine the suitability and completeness of this information for his own particular use. No warranty is implied regarding the accuracy of the data or the results to be obtained from the products use.

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Catalog Numbers: BU5007-A, BU5007-B, BU5007-C, BU5007-D, BU5007-P, BU5007-Q, BU5007-G, BU5007-T

Product Identity: Buffer Solution, pH 7.00

Chemical Family: Not Applicable
Synonyms: Not Applicable
Recommended Use: Laboratory chemicals

Manufacturer's Name: AquaPhoenix Scientific, Inc., 9 Barnhart Dr., Hanover, PA 17331, (866) 632-1291
Emergency Contact Number (24hr): Chemtel (800) 255-3924

Issue Date: 12/28/06
Revision Date: 06/24/09, 08/26/10, 02/19/12, 08/02/12

Section 2 – Hazard Identification

Emergency Overview: Non-flammable, non-corrosive, non-toxic. Does not present significant health hazards. Wash areas of contact with water.
Appearance: Clear, yellowish liquid **Odor:** Odorless
Target Organs: Eyes, skin
Potential Health Effects/ Routes of Exposure:
Eyes: May cause slight irritation.
Skin: May cause slight irritation.
Ingestion: May cause diarrhea, nausea, vomiting, and cramps.
Inhalation: Not likely to be a hazard.
Chronic Effect / Carcinogenicity: None (IARC, NTP, OSHA)
Aggravated Medical Conditions No information available
These chemicals are not considered hazardous by OSHA.
See section 11 for toxicological information. See section 12 for potential environmental effects.

Section 3 – Composition, Information on Ingredients

Sodium Hydroxide, CAS# 1310-73-2, <1% v/v
Potassium Phosphate, Monobasic, CAS# 7778-77-0, <1% w/v
Sorbic Acid, CAS# 110-44-1, <1% w/v
Water, purified, CAS# 7732-18-5, >99% w/v

Section 4 – First Aid

Eyes: Immediately flush eyes with water for at least 15 minutes. Get medical assistance immediately.
Skin: Flush with water for 15 minutes. Get medical assistance if irritation develops.
Ingestion: DO NOT induce vomiting. Dilute with water or milk. Get medical assistance.
Inhalation: Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
Notes to Physician Treat symptomatically.

Section 5 – Fire Fighting Measures

Flash Point: Not Applicable **Autoignition Temperature:** No information available.
Explosion Limits Upper No data available **Lower** No data available
Extinguishing Media: Use means suitable to extinguishing surrounding fire.
Unsuitable Extinguishing Media: No information available

Fire & Explosion Hazards: Not considered to be a fire or explosion hazard.
Fire Fighting Instructions / Equipment: Use normal procedures. Use protective clothing. Use NIOSH-approved breathing equipment.
Hazardous Combustion Products: No information Available
Sensitivity to mechanical impact No information available.
Sensitivity to static discharge No information available.
Specific Hazards Arising from the Chemical: No information available
NFPA Rating: (estimated) Health: 1; Flammable: 0; Reactivity: 0

Section 6 – Accidental Release Measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.
Environmental Precautions No information available.
Methods for Containment and Clean Up Absorb with suitable material. Always obey local regulations.

Section 7 – Handling and Storage

Handling: Wash hands after handling. Avoid contact with skin and eyes.
Storage: Protect from freezing and physical damage.

Section 8 – Exposure Controls, Personal Protection

Sodium Hydroxide, CAS# 1310-73-2, ACGIH TLV: 2 mg/m3, OSHA PEL: 2mg/m3
Potassium Phosphate, Monobasic, CAS# 7778-77-0, ACGIH TLV: NA, OSHA PEL: NA
Sorbic Acid, CAS# 110-44-1, ACGIH TLV: NA, OSHA PEL: NA
Water, purified, CAS# 7732-18-5, ACGIH TLV: NA, OSHA PEL: NA

Engineering Measures/ General Hygiene: Normal ventilation is adequate. Ensure eyewash and safety showers are available.
Personal Protection Equipment: Skin Protection: Chemical resistant gloves.
Eye/Face Protection: Safety Glasses or goggles. **Respiratory Protection:** Normal ventilation is adequate

Section 9 – Physical and Chemical Properties

Appearance/Physical State: Clear, yellow liquid
Odor: Odorless
Boiling Point: Approx 100C
Melting Point: Approx 0 C
Vapor Density: No Information Available
Evaporation Rate: No Information Available
pH: 7.0
Flammability: No Information Available
Solubility: Infinite
Relative Density: No Information Available
% Volatility: No Information Available
Specific Gravity: Approx 1
Vapor Pressure: No Information Available
Flash Point: Not Applicable
Coefficient of water/oil distribution: Not Available
Odor Threshold: Not Available
Decomposition Temperature: No Information Available
Partition Coefficient n-octanol/water: Not Available
Molecular Weight: Not available

Section 10 – Stability and Reactivity

Chemical Stability: Stable under normal conditions of use and storage.
Incompatible Materials None identified.
Conditions to Avoid: No Information Available.
Hazardous Decomposition Products: Oxides of phosphorus.
Hazardous Polymerization: Does not occur.
Hazardous Reactions: None under normal processing.

Section 11 – Toxicological Information

Routes of Exposure/Symptoms/Corrosiveness – See Section 2

LD50 orl-rat: 1350mg/kg (Sodium Hydroxide) 1700mg/kg (Potassium Phosphate, Monobasic)
LC50 inhalation-rat: NA
Irritation: No Information Available.
Toxicologically Synergistic: No information available.
Chronic Exposure
Carcinogenicity No information available
Sensitization No information available.
Mutagenic Effects No information available.
Reproductive Effects No information available.
Developmental Effects (Immediate/Delayed) No information available.
Teratogenicity No information available.
Other Adverse Effects No information available.
Endocrine Disruptor Information No information available

Section 12 – Ecological Information

Ecotoxicity: Not Available.
Persistence and Degradability: No Information Available **Mobility:** No Information Available
Bioaccumulation/ Accumulation: No Information Available

Section 13 – Disposal Considerations

Waste Disposal/Waste Disposal of Packaging: Dilute with water.
All chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. Comply with all local, state, and federal regulations.

Section 14 – Transport Information

DOT - Not Regulated

Section 15 – Regulatory Information (not meant to be all inclusive)

OSHA Status: These chemicals are not considered hazardous by OSHA.
Canada DSL: These chemicals are listed on Canada's DSL list.
TSCA: These chemicals are listed on the TSCA Inventory.
SARA Title III Section 313: Not Applicable
RCRA Status: Not Applicable
CERCLA Reportable Quantity: Sodium Hydroxide – 1000lb
WHMIS: Not Applicable.
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR

Section 16 – Additional Information

Disclaimer: The information on this MSDS applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to determine the suitability and completeness of this information for his own particular use. No warranty is implied regarding the accuracy of the data or the results to be obtained from the products use.

RUST-OLEUM CORP -- LABOR SAVER MARKING PAINTS, 2533 -- 8010-00N021794

========== Product Identification ==========

Product ID:LABOR SAVER MARKING PAINTS, 2533
MSDS Date:09/29/1987
FSC:8010
NIIN:00N021794
MSDS Number: BLRYV
=== Responsible Party ===
Company Name:RUST-OLEUM CORP
Address:11 HAWTHORN PARKWAY
City:VERNON HILLS
State:IL
ZIP:60061
Country:US
Info Phone Num:312-367-7700
Emergency Phone Num:312-864-8200
Preparer's Name:MJS
CAGE:08882
=== Contractor Identification ===
Company Name:RUST-OLEUM CORP
Address:11 HAWTHORN PARKWAY
Box:City:VERNON HILLS
State:IL
ZIP:60061-1583
Country:US
Phone:847-367-7700
CAGE:08882

========== Composition/Information on Ingredients ==========

Ingred Name:PROPANE
CAS:74-98-6
RTECS #:TX2275000
Fraction by Wt: 16-18%
OSHA PEL:1000 PPM
ACGIH TLV:ASPHYXIANT; 9192

Ingred Name:PROPANE, 2-METHYL-; (ISOBUTANE). VP: 40 PSIA. LEL: 1.9%
CAS:75-28-5
RTECS #:TZ4300000
Fraction by Wt: 10-12%

Ingred Name:TITANIUM DIOXIDE
CAS:13463-67-7
RTECS #:XR2275000
Fraction by Wt: 0-8%
OSHA PEL:15 MG/M3 TDUST
ACGIH TLV:10 MG/M3 TDUST; 9293

Ingred Name:SUPP DATA:CAUSE BLINDNESS IF INGESTED.
RTECS #:9999999ZZ

Ingred Name:METHYL ALCOHOL (METHANOL) (SARA III)
CAS:67-56-1
RTECS #:PC1400000
Fraction by Wt: 0-4%
OSHA PEL:S,200PPM/250STEL
ACGIH TLV:S,200PPM/250STEL; 93
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

Ingred Name:TOLUENE (SARA III)
CAS:108-88-3
RTECS #:XS5250000
Fraction by Wt: 0-18%
OSHA PEL:200 PPM/150 STEL
ACGIH TLV:50 PPM; 9293
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:HEXANE (N-HEXANE)
CAS:110-54-3
RTECS #:MN9275000
Fraction by Wt: 6-10%
OSHA PEL:500 PPM

ACGIH TLV:50 PPM; 9293
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:XYLENES (O-,M-,P- ISOMERS) (SARA III)
CAS:1330-20-7
RTECS #:ZE2100000
Fraction by Wt: 5-20%
OSHA PEL:100 PPM/150 STEL
ACGIH TLV:100 PPM/150STEL;9192
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:ETHYLENE GLYCOL (SARA III)
CAS:107-21-1
RTECS #:KW2975000
Fraction by Wt: 0-4%
OSHA PEL:C 50 PPM
ACGIH TLV:C 50 PPM,VAPOR; 9192
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:VM&P NAPHTHA. VP: 2 @ 20C. LEL: 0.9%
CAS:64742-89-8
Fraction by Wt: 1-3%
OSHA PEL:300 PPM;400 PPM STEL
ACGIH TLV:300 PPM

========== Hazards Identification ==========

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:(ACUTE) INHAL: ANESTHETIC, IRRIT OF RESP TRACT/ACUTE NERV SYS DEPRESS CHARACT BY HDCH, DIZZ, STAG, CONFUSN, UNCON/ COMA. SKIN/EYE: PRIMARY IRRITANT WHICH DEFATS SKIN & CAN LEAD TO DERMAT W/ RPTD OVERE XP. INGEST: GI IRRIT, NAUS, VOMIT & DIARR. (CHRONIC) RPTS HAVE SHOWN RPTD & PRLNGD OCCUP OVEREXP TO (SEE EFTS OF OVEREXP
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ: SOLV W/PERM BRAIN & NERV SYS DMG. OVEREXP TO XYLOL & TOLUENE IN LAB ANIMALS HAS SHOWN LIVER, KIDNEY, SPLEEN & EYE DMG AS WELL AS ANEMIA. IN HUMANS, OVEREXP HAS BEEN FOUND TO CAUSE LIVER & CA RDIAC ABNORMALITIES. OVEREXP TO HEXANE IN HIGH VAP CONC (1000-1500 PPM) OVER A PERIOD OF SEV MONTHS HAS BEEN (SUPP DATA)
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

========== First Aid Measures ==========

First Aid:INHAL: REMOVE FROM EXPOS, RESTORE BRTHG & NOTIFY MD. EYE: FLUSH IMMED W/LRG AMTS OF WATER FOR AT LEAST 15 MIN. NOTIFY MD. SKIN: WASH AFFECTED AREA W/SOAP & WATER, REMOVE CONTAM CLTHG & WASH BEFORE REU SE. WASH HANDS BEFORE EATING/SMOKING. INGEST: DO NOT INDUCE VOMIT. KEEP PERSON WARM, QUIET & GET MD. ASPIR OF MATL IN LUNGS CAN CAUSE CHEM PNEUM WHICH CAN BE FATAL.

========== Fire Fighting Measures ==========

Flash Point Method:TCC
Flash Point:<0F,<-18C
Lower Limits:SEE INGRED
Extinguishing Media:NFPA CLASS B EXTINGUISHERS (CO2, DRY CHEMICAL OR FOAM).
Fire Fighting Procedures:WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP . WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CLSD CNTNRS TO PVNT PRESS BUILDUP (SUPP DATA)
Unusual Fire/Explosion Hazard:KEEP CNTNRS TIGHTLY CLSD. ISOLATE FROM HEAT, ELEC EQUIP, SPARKS & OPEN FLAME. CLSD CNTNRS MAY EXPLODE WHEN EXPSD TO EXTREME HEAT. DO NOT APPLY TO HOT SURFACES.

========== Accidental Release Measures ==========

Spill Release Procedures:REMOVE ALL SOURCES OF IGNITION, VENTILATE AREA AND REMOVE WITH INERT ABSORBENT AND NONSPARKING TOOLS.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

========== Handling and Storage ==========

Handling and Storage Precautions:DO NOT STORE ABOVE 120F. DO NOT PUNCTURE.
Other Precautions:INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

========== Exposure Controls/Personal Protection ==========

Respiratory Protection:USE NIOSH/MSHA APPROVED CHEMICAL CARTRIDGE RESPIRATOR (TC23C) TO REMOVE SOLID AIRBORNE PARTICLES OF OVERSPRAY AND ORGANIC VAPORS DURING SPRAY APPLICATION. IN CONFINED AREAS: USE NIOSH/MSHA APPROVED SU PPLIED-AIR RESPIRATOR OR HOODS (TC19C).
Ventilation:PROVIDE GENERAL OR LOCAL EXHAUST VENT IN VOLUME & PATTERN TO KEEP TLV OF MOST HAZ INGREDS BELOW ACCEPTABLE LIMIT.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices:WASH HANDS BEFORE EATING OR SMOKING.
Supplemental Safety and Health
FIRE FIGHT PROC: AND POSSIBLE AUTOIGNITION OR EXPLOSION. IF WATER IS USED, FOG NOZZLES ARE PREFERRED. EFTS OF OVEREXP: SHOWN TO CAUSE PERIPHERAL POLYNEUROPATHY WHICH HAS THE POTENTIAL OF BECOMING IRRE VERSIBLE. OVEREXP TO METHYL ALCOHOL HASBEEN SHOWN TO AFFECT CNS, ESPECIALLY OPTIC NERVE. MAY BE FATAL OR (SEE ING 10)

========== Physical/Chemical Properties ==========

HCC:F2
Boiling Pt:B.P. Text:<0F,<-18C
Vapor Pres:SEE INGRED
Vapor Density:HVR/AIR
Evaporation Rate & Reference:SLOWER THAN ETHER
Appearance and Odor:NONE SPECIFIED BY MANUFACTURER.

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:BY OPEN FLAME - CO AND CO2.

========== Disposal Considerations ==========

Waste Disposal Methods:DISPOSE OF ACCORDING TO LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT INCINERATE CLOSED CONTAINERS.

Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Methanol
MET1440

Issue Date: 2006-06

Section 1 - Chemical Product and Company Identification 61

Material Name: Methanol **CAS Number:** 67-56-1
Chemical Formula: CH_4O
Structural Chemical Formula: CH_3OH
EINECS Number: 200-659-6
ACX Number: X1001287-2
Synonyms: ALCOHOL,METHYL; ALCOOL METHYLIQUE; ALCOOL METILICO; CARBINOL; X-CIDE 402 INDUSTRIAL BACTERICIDE; COAT-B1400; COLONIAL SPIRIT; COLONIAL SPIRITS; COLUMBIAN SPIRIT; COLUMBIAN SPIRITS; EPA PESTICIDE CHEMICAL CODE 053801; EUREKA PRODUCTS CRIOSINE DISINFECTANT; EUREKA PRODUCTS,CRIOSINE; FREERS ELM ARRESTER; IDEAL CONCENTRATED WOOD PRESERVATIVE; METANOL; METANOLO; METHANOL; METHYL ALCOHOL; METHYL HYDRATE; METHYL HYDROXIDE; METHYLALKOHOL; METHYLOL; METYLOWY ALKOHOL; MONOHYDROXYMETHANE; PMC REJEX-IT F-40ME; PYROLIGNEOUS SPIRIT; PYROXYLIC SPIRIT; PYROXYLIC SPIRITS; SURFLO-B17; WILBUR-ELLIS SMUT-GUARD; WOOD ALCOHOL; WOOD NAPHTHA; WOOD SPIRIT
Derivation: Prepared by wood pyrolysis; non-catalytic oxidation of hydrocarbons; as a by-product in the fisher-tropsch synthesis; or by reduction of carbon monoxide.
General Use: Used as an industrial solvent; starting material for organic synthesis; antifreeze for windshield washer fluid; in fuel antifreezes; gasoline octane booster; fuel for stoves; extractant for oils; denaturing ethanol; softening agent; food additive; in paint, varnish removers, and embalming fluids; in the manufacture of photographic film, celluloid, textile soap, wood stains, coated fabrics, shatterproof glass, paper coating, waterproofing formulations, artificial leather, dyes.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
Methanol	67-56-1	ca 100% vol

Trace Impurities: (Grade A): Acetone and aldehydes < 30 ppm, acetic acid < 30 ppm

OSHA PEL
TWA: 200 ppm; 260 mg/m^3.

ACGIH TLV
TWA: 200 ppm; STEL: 250 ppm; skin.

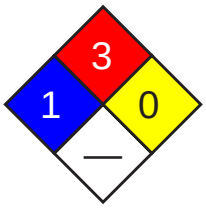
EU OEL
TWA: 260 mg/m^3 (200 ppm).

NIOSH REL
TWA: 200 ppm (260 mg/m^3); STEL: 250 ppm (325 mg/m^3); skin.

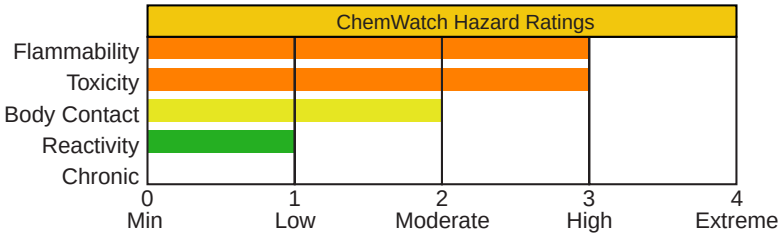
IDLH Level
6000 ppm.

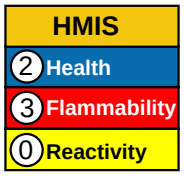
DFG (Germany) MAK
TWA: 200 ppm; PEAK: 800 ppm; skin.

Section 3 - Hazards Identification



Fire Diamond





ANSI Signal Word
Warning!


Flammable

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Colorless liquid; slight alcohol odor when pure or disagreeably pungent odor. Irritating to eyes/skin/respiratory tract. Other Acute Effects: headache, visual disturbance, blindness, respiratory failure. Chronic Effects: reproductive effects reported in animal testing. Flammable; moderate explosion hazard.

Potential Health Effects

Target Organs: Eyes, skin, central nervous system (CNS), gastrointestinal (GI) tract, respiratory system
Primary Entry Routes: Inhalation, ingestion, skin and/or eye contact/absorption
Acute Effects
Inhalation: Irritation, breathing difficulty, headache, drowsiness, vertigo, light-headedness, nausea, vomiting, acidosis (decreased blood alkalinity), visual disturbance, and at high concentrations, CNS damage, convulsions, circulatory collapse, respiratory failure, coma and blindness can result from inhalation of methanol vapor. Concentration >= 200 ppm may cause headache; 50,000 ppm can cause death within 1-2 hrs.
Eye: Contact with liquid may result in irritation, inflamed lids, light sensitization, and superficial lesions.
Skin: Contact may cause irritation, dermatitis, swelling, scaling, and systemic effects.
Ingestion: GI irritation and systemic effects. Symptoms may be delayed 18-48 hours. Fatal dose - 2 to 8 ounces.
Carcinogenicity: NTP - Not listed; IARC - Not listed; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.
Medical Conditions Aggravated by Long-Term Exposure: None reported.
Chronic Effects: Exposure to methanol vapors has caused conjunctivitis, headache, giddiness, insomnia, GI disturbance, impaired vision. CNS damage is also likely. Methanol is slowly eliminated from the body; exposure is considered cumulative over the short term.

Section 4 - First Aid Measures

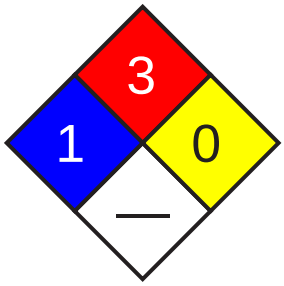
See DOT ERG

Inhalation: Remove exposed person to fresh air and support breathing as needed.
Eye Contact: *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water for at least 15 minutes. Consult a physician or ophthalmologist if pain or irritation develops.
Skin Contact: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. For reddened or blistered skin, consult a physician.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have the *conscious and alert* person drink 1 to 2 glasses of water, then induce vomiting.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: Follow emesis with rehydration, correction of acidosis, and folate to enhance formate oxidation. Consider IV administration of ethanol (if blood methanol >20 mg/dL) to show metabolic oxidation of methanol. Assay formic acid in urine, blood pH and plasma bicarbonate.

Section 5 - Fire-Fighting Measures

See DOT ERG

Flash Point: 54 °F (12 °C), Closed Cup
Burning Rate: 1.7 mm/min
Autoignition Temperature: 867 °F (464 °C)
LEL: 6.0% v/v
UEL: 36% v/v
Flammability Classification: OSHA Class IB Flammable Liquid.
Extinguishing Media: Use dry chemical, carbon dioxide, water spray, fog or alcohol-resistant foam. A water spray may be used to cool fire-exposed containers, and flush spills away from ignition sources.



Fire Diamond

General Fire Hazards/Hazardous Combustion Products: Heating methanol to decomposition can produce carbon oxides (CO_x), formaldehyde, acrid smoke, and irritating fumes. Can form explosive mixtures in the air. The heavier-than-air vapors of methanol may travel along low-lying surfaces to distant sources of ignition and flash back to the material source. Containers may explode in heat of fire.
Fire-Fighting Instructions: *Do not* scatter material with any more water than needed to extinguish fire. *Do not* release runoff from fire control methods to sewers or waterways. Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

Section 6 - Accidental Release Measures

See DOT ERG

Spill/Leak Procedures: Isolate spill area for at least 330-660 feet (100-200 m) in all directions. Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Ground all equipment used when handling this product. *Do not* touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors.
Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

Use clean non-sparking tools to collect absorbed material.

Large Spills: Dike far ahead of liquid spill for later disposal. *Do not* release into sewers or waterways. Ground all equipment. Use non-sparking tools.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid vapor inhalation, and skin and eye contact. Use only with ventilation sufficient to reduce airborne concentrations to non-hazardous levels (see Sec. 2). Wear protective gloves, goggles, and clothing (see Sec. 8). Keep away from heat and ignition sources. Ground and bond all containers during transfers to prevent static sparks. Use non-sparking tools to open and close containers.

Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Recommended Storage Methods: Store in tightly closed container in cool, well-ventilated area, away from heat, ignition sources and incompatibles (see Sec. 10). Equip drums with self-closing valves, pressure vacuum bungs, and flame arrestors.

Regulatory Requirements: Follow applicable OSHA regulations. Also 29 CFR 1910.106 for Class 1B Flammable Liquids.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations. Provide general or local exhaust ventilation systems to maintain airborne concentrations as low as possible. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls: Enclose operations and/or provide local explosion-proof exhaust ventilation at the site of chemical release. Where possible, transfer methanol from drums or other storage containers to process containers. Minimize sources of ignition in surrounding areas.

Personal Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets of butyl rubber, Teflon, Viton, Saranex, 4H, Responder, Trellchem HPS, or Tychem 10000 (Breakthrough Time (BT) >8 hr) to prevent skin contact. Natural rubber, neoprene, nitrile rubber, polyethylene, polyvinyl alcohol and CPF 3 may degrade after contact and are not recommended. Wear splash-proof chemical safety goggles, and face shield, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/ NIOSH-approved respirator. For concentrations <= 2000 ppm, use a supplied air respirator; <= 5000 ppm, supplied air (SA) respirator in continuous flow mode; <= 6000 ppm, SA respirator with tight-fitting face mask operated in continuous flow mode, or SCBA with full facepiece, or SA respirator with full facepiece; > IDLH/unknown/emergency, SCBA with full facepiece operated in pressure-demand or other positive-pressure mode, or SA respirator with full facepiece operated in pressure-demand or other positive-pressure mode in combination with auxiliary SCBA operated in pressure-demand or other positive-pressure mode. For escape, use an appropriate escape-type SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen- deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Other: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment. Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Colorless; slight alcohol odor when pure, disagreeably pungent odor when crude.

Physical State: Liquid

Odor Threshold: 13.1150 to 26840 mg/m^3

Vapor Pressure (kPa): 127 mm Hg at 77 °F (25 °C)

Vapor Density (Air=1): 1.11

Bulk Density: 6.59 lbs/gal at 68 F (20 °C)

Formula Weight: 32.04

Density: 0.796 g/mL at 59 °F (15 °C)

Specific Gravity (H_2O=1, at 4 °C): 0.81 at 0 °C/4 °C

Refractive Index: 1.3292 at 68 °F (20 °C)

pH: Slightly acidic

Boiling Point: 148 °F (64.7 °C) at 760 mm Hg

Freezing/Melting Point: -144.04 °F (-97.8 °C)

Viscosity: 0.614 mPa sec

Surface Tension: 22.61 dynes/cm

Ionization Potential (eV): 10.84 eV

Water Solubility: Miscible

Other Solubilities: Ethanol, acetone, benzene, chloroform, DMSO, ether, ketones, most organic solvents.

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Methanol is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur. Vapor inhalation, oxidizers.

Storage Incompatibilities: Include beryllium dihydride, metals (potassium, magnesium), oxidants (barium perchlorate, bromine, chlorine, hydrogen peroxide, sodium hypochlorite, phosphorus trioxide), potassium tertbutoxide, carbon tetrachloride and metals, chloroform and heat, diethyl zinc, alkyl aluminum salts, acetyl bromide, chloroform and sodium hydroxide, cyanuric chloride, nitric acid, chromic anhydride, lead perchlorate.

Hazardous Decomposition Products: Thermal oxidative decomposition of methanol can produce carbon oxides (CO_x), formaldehyde, acrid smoke, and irritating fumes.

Section 11 - Toxicological Information

Acute Oral Effects:

Rat, oral, LD_{50}: 5628 mg/kg.

Human, oral, LD_{Lo}: 428 mg/kg produced toxic effects: behavioral - headache; lungs, thorax, or respiration - other changes.

Human, oral, LD_{Lo}: 143 mg/kg produced optic nerve neuropathy, dyspnea, nausea or vomiting.

Acute Inhalation Effects:

Rat, inhalation, LC_{50}: 64000 ppm/4 hr.

Human, inhalation, TC_{Lo}: 300 ppm produced visual field changes, headache; lungs, thorax, or respiration - other changes.

Acute Skin Effects:

Rabbit, skin, LD_{50}: 15800 mg/kg.

Monkey, skin, LD_{Lo}: 393 mg/kg.

Irritation Effects:

Rabbit, standard Draize test: 100 mg/24 hr resulted in moderate irritation.

Rabbit, standard Draize test: 20 mg/24 hr resulted in moderate irritation.

Other Effects:

Rat, oral: 10 µmol/kg resulted in DNA damage.

Rat, inhalation: 50 mg/m^3/12 hr/13 weeks intermittently produced degenerative changes to brain and coverings; muscle contraction or spasticity.

Rat, inhalation: 2610 ppm/6 hr/4 weeks intermittently produced toxic effects: endocrine - changes in spleen weight.

Multiple Dose Toxicity Effects - Rat, oral: 12 g/kg/8 weeks intermittently produced toxic effects: behavioral - ataxia; behavioral - alteration of operant conditioning.

Human, lymphocyte: 300 mmol/L resulted in DNA inhibition.

Rat (female), oral: 7500 mg/kg, administered during gestational days 17-19 produced effects on newborn - behavioral.

Rat (female), oral: 35295 mg/kg administered during gestational days 1-15 produced effects on the fertility index; pre implantation mortality; and post-implantation mortality.

Rat (female), inhalation: 20000 ppm/7 hr, administered during gestational days 1-22 produced specific developmental abnormalities - musculoskeletal system; cardiovascular (circulatory) system; urogenital system.

Rat (male), oral: 200 ppm/20 hr, 78 weeks prior to mating produced paternal effects - testes, epididymis, sperm duct.

See *RTECS* PC1400000, for additional data.

Section 12 - Ecological Information

Environmental Fate: Bioconcentration (BCF, estimated at 0.2) is not expected to be significant. Physical removal from air can occur via rainfall. Relatively rapid evaporation from dry surfaces is likely to occur. If released to the atmosphere, it degrades via reaction with photochemically produced hydroxyl radicals with an approximate half-life of 17.8 days. If released to water or soil, biodegradation is expected to occur. A low K_{oc} indicates little sorption and high mobility in the soil column.

Ecotoxicity: Trout, LC_{50}: 8,000 mg/L/48 hr; *Pimephales promelas* (fathead minnow) LC_{50}: 29.4 g/L/96 hr.

Henry's Law Constant: 4.55 $x10^{-6}$ atm-m^3/mole at 77 °F (25 °C)

Octanol/Water Partition Coefficient: log K_{ow} = -0.77

Soil Sorption Partition Coefficient: K_{oc} = 0.44

Section 13 - Disposal Considerations

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Note: This material has multiple possible HMT entries. Choose the appropriate one based on state and condition of specific material when shipped.

Shipping Name and Description: Methanol
ID: UN1230
Hazard Class: 3 - Flammable and combustible liquid
Packing Group: II - Medium Danger
Symbols: + I

Label Codes: 3 - Flammable Liquid, 6.1 - Poison *or* Poison Inhalation Hazard *if inhalation hazard, Zone A or B*
Special Provisions: IB2, T7, TP2
Packaging: **Exceptions:** 150 **Non-bulk:** 202 **Bulk:** 242
Quantity Limitations: **Passenger aircraft/rail:** 1 L **Cargo aircraft only:** 60 L
Vessel Stowage: **Location:** B **Other:** 40

Shipping Name and Description: Methanol
ID: UN1230
Hazard Class: 3 - Flammable and combustible liquid
Packing Group: II - Medium Danger
Symbols: D - Domestic transportation

Label Codes: 3 - Flammable Liquid
Special Provisions: IB2, T7, TP2
Packaging: **Exceptions:** 150 **Non-bulk:** 202 **Bulk:** 242
Quantity Limitations: **Passenger aircraft/rail:** 1 L **Cargo aircraft only:** 60 L
Vessel Stowage: **Location:** B **Other:**

Section 15 - Regulatory Information

EPA Regulations:

RCRA 40 CFR: Listed U154 Ignitable Waste
CERCLA 40 CFR 302.4: Listed per RCRA Section 3001 5000 lb (2268 kg)
SARA 40 CFR 372.65: Listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Group, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Issue Date: 2006-06

Section 1 - Chemical Product and Company Identification 61

Material Name: Nitric Acid **CAS Number:** 7697-37-2
Chemical Formula: HNO_3
Structural Chemical Formula: HNO_3
EINECS Number: 231-714-2
ACX Number: X1002177-5
Synonyms: ACIDE NITRIQUE; ACIDO NITRICO; AQUA FORTIS; AZOTIC ACID; AZOTOWY KWAS; ENGRAVER'S ACID; ENGRAVERS ACID; HYDROGEN NITRATE; KYSELINA DUSICNE; NITAL; NITRIC ACID; NITRIC ACID OTHER THAN RED FUMING WITH >70% NITRIC ACID; NITRIC ACID OTHER THAN RED FUMING WITH NOT >70% NITRICACID; NITROUS FUMES; NITRYL HYDROXIDE; RED FUMING NITRIC ACID (RFNA); SALPETERSAURE; SALPETERZUUROPLOSSINGEN; WHITE FUMING NITRIC ACID (WFNA)
General Use: Manufacture of organic and inorganic nitrates and nitro compounds for fertilizers, dye intermediates and many organic chemicals.
Used for etching and cleaning metals.
Operators should be trained in procedures for safe use of this material.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
nitric acid	7697-37-2	>95

OSHA PEL
TWA: 2 ppm; 5 mg/m^3.

ACGIH TLV
TWA: 2 ppm; STEL: 4 ppm.

EU OEL
STEL: 2.6 mg/m^3 (1 ppm).

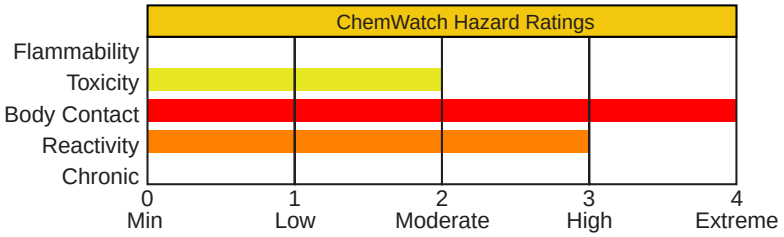
NIOSH REL
TWA: 2 ppm (5 mg/m^3); STEL: 4 ppm (10 mg/m^3).

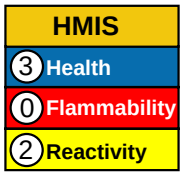
IDLH Level
25 ppm.

DFG (Germany) MAK
TWA: 2 ppm; PEAK: 2 ppm.

Section 3 - Hazards Identification

Fire Diamond





ANSI Signal Word

Danger!


Corrosive

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Clear to yellow fuming liquid; acrid, suffocating odor. Corrosive. Other Acute Effects: lung damage. Chronic Effects: tooth erosion, bronchitis. Strong oxidizer.

Potential Health Effects

Target Organs: eyes, skin, respiratory system, teeth
Primary Entry Routes: inhalation, ingestion, skin contact, eye contact
Acute Effects
Inhalation: The vapor is extremely discomforting and corrosive to the upper respiratory tract and lungs and the material presents a hazard from a single acute exposure or from repeated exposures over long periods.
Inhalation hazard is increased at higher temperatures.
Reactions may occur following a single acute exposure or may only appear after repeated exposures.

Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later.
The material may produce respiratory tract irritation which produces an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system. Unlike most organs the lung can respond to a chemical insult or agent by first trying to remove or neutralize the irritant and then repairing the damage. The repair process, which initially developed to protect mammalian lungs from foreign matter and antigens, may however, cause further damage the lungs when activated by hazardous chemicals. The result is often the impairment of gas exchange, the primary function of the lungs.
Inhalation of nitric acid mist or fumes at 2 to 25 ppm over an 8 hour period may cause pulmonary irritation and symptoms of lung damage.
Only several minutes of exposure to concentrated atmosphere i.e. 200 ppm may cause severe pulmonary damage and even fatality. Death may be delayed for several days.
Exposure to nitric acid fumes (with concurrent inhalation of nitrogen dioxide and nitric oxide) may elicit prompt irritation of the upper respiratory tract leading to coughing, gagging, chest pain, dyspnea, cyanosis if concentrations are sufficiently high and duration of exposure sufficiently long, pulmonary edema.

Eye: The liquid is extremely corrosive to the eyes and contact may cause rapid tissue destruction and is capable of causing severe damage with loss of sight.
The vapor is extremely discomforting to the eyes and is capable of causing pain and severe conjunctivitis.
Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.
The material may produce moderate eye irritation leading to inflammation.
Repeated or prolonged exposure to irritants may produce conjunctivitis.
Eye contact with concentrated acid may give no pain, whilst diluted solution causes intense pain and both can cause permanent eye damage or blindness. Burns may result in shrinkage of the eyeball, symblepharon (adhesions between tarsal and bulbar conjunctivae), permanent corneal opacification, and visual impairment leading to blindness.

Skin: The liquid is extremely corrosive to the skin and contact may cause tissue destruction with severe burns.
Bare unprotected skin should not be exposed to this material.
The vapor is highly discomforting to the skin.
The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterized by skin redness (erythema) and swelling (edema) which may progress to vesiculation, scaling and thickening of the epidermis. Histologically there may be intercellular edema of the spongy layer (spongiosis) and intracellular edema of the epidermis.
Skin contact causes yellow discoloration of the skin, blisters and scars that may not heal. The skin may be stained bright-yellow or yellowish brown due to the formation of xanthoproteic acid. Dilute solutions may harden the epithelium without producing overt corrosion.

Ingestion: Considered an unlikely route of entry in commercial/industrial environments.
The material is extremely corrosive if swallowed and is capable of causing burns to mouth, throat, esophagus, with extreme discomfort, pain and may be fatal.
Even a small amount causes severe corrosion of the stomach, burning pain, vomiting and shock, possibly causing non-healing scarring of the gastrointestinal tract and stomach. Death may be delayed 12 hours to 14 days or to several months. Such late fatalities are attributed to a chemical lobular pneumonitis secondary to aspiration. Survivors show stricture of the gastric mucosa and subsequent pernicious anemia.

Carcinogenicity: NTP - Not listed; IARC - Not listed; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.

Chronic Effects: Prolonged or repeated overexposure to low concentrations of vapor may cause chronic bronchitis, corrosion of teeth, even chemical pneumonitis.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air.
Lay patient down. Keep warm and rested.
If available, administer medical oxygen by trained personnel.
If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital or doctor, without delay.

Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.
Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Immediately transport to hospital or doctor. DO NOT delay.

Skin Contact: Immediately flush body and clothes with large amounts of water, using safety shower if available.
Quickly remove all contaminated clothing, including footwear.
Wash affected areas with water (and soap if available) for at least 15 minutes. Transport to hospital or doctor. DO NOT delay.

Ingestion: Contact a Poison Control Center.
Do NOT induce vomiting. Give a glass of water.
Immediately transport to hospital or doctor. DO NOT delay.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: For acute or short-term repeated exposures to strong acids:

1.Airway problems may arise from laryngeal edema and inhalation exposure.
Treat with 100% oxygen initially.
2.Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.
3. Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
4.Strong acids produce a coagulation necrosis characterized by formation of a coagulum (eschar) as a result of the desiccating action of the acid on proteins in specific tissues.

INGESTION:

1.Immediate dilution (milk or water) within 30 minutes post-ingestion is recommended.
2.Do not attempt to neutralize the acid since exothermic reaction may extend the corrosive injury.
3.Be careful to avoid further vomiting since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
4.Charcoal has no place in acid management.
5.Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

1.Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
2.Deep second-degree burns may benefit from topical silver sulfadiazine.

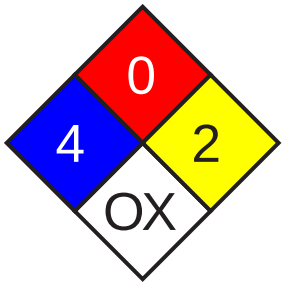
EYE:

1.Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. Do not use neutralizing agents or any other additives. Several liters of saline are required.
2.Cycloplegic drops (1% cyclopentolate for short-term use or 5% homatropine for longer term use), antibiotic drops, vasoconstrictive agents, or artificial tears may be indicated dependent on the severity of the injury.
3.Steroid eye drops should only be administered with the approval of a consulting ophthalmologist.

Section 5 - Fire-Fighting Measures

Flash Point: Nonflammable
Autoignition Temperature: Not applicable
LEL: Not applicable
UEL: Not applicable
Extinguishing Media: Water spray or fog; foam, dry chemical powder, or BCF (where regulations permit).
Carbon dioxide.

See DOT ERG



Fire Diamond

General Fire Hazards/Hazardous Combustion Products: Will not burn but increases intensity of fire.
Heating may cause expansion or decomposition leading to violent rupture of containers.
Heat affected containers remain hazardous.
Contact with combustibles such as wood, paper, oil or finely divided metal may cause ignition, combustion or violent decomposition.
May emit irritating, poisonous or corrosive fumes.
Decomposes on heating and produces toxic fumes of nitrogen oxides (NO_x) and nitric acid.

Fire Incompatibility: Oxidizing agents as a class are not necessarily combustible themselves, but can increase the risk and intensity of fire in many other substances.
Reacts vigorously with water and alkali.
Avoid reaction with organic materials/compounds, powdered metals, reducing agents and hydrogen sulfide (H_2S) as ignition may result.
Reacts with metals producing flammable/explosive hydrogen gas.

Fire-Fighting Instructions: Contact fire department and tell them location and nature of hazard.
May be violently or explosively reactive. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways. Consider evacuation.
Fight fire from a safe distance, with adequate cover.
Extinguishers should be used only by trained personnel.
Use water delivered as a fine spray to control fire and cool adjacent area.
Avoid spraying water onto liquid pools.
Do not approach containers suspected to be hot.
Cool fire-exposed containers with water spray from a protected location.
If safe to do so, remove containers from path of fire.
If fire gets out of control withdraw personnel and warn against entry.
Equipment should be thoroughly decontaminated after use.

Section 6 - Accidental Release Measures

Small Spills: Dangerous levels of nitrogen oxides may form during spills of nitric acid.
Wear fully protective PVC clothing and breathing apparatus.
Clean up all spills immediately. No smoking, bare lights, ignition sources.
Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result.
Avoid breathing dust or vapors and all contact with skin and eyes.
Control personal contact by using protective equipment.
Contain and absorb spill with dry sand, earth, inert material or vermiculite. DO NOT use sawdust as fire may result.
Scoop up solid residues and seal in labeled drums for disposal.
Neutralize/decontaminate area.
Use soda ash or slaked lime to neutralize.

Large Spills: DO NOT touch the spill material. Restrict access to area.
Clear area of personnel and move upwind. Contact fire department and tell them location and nature of hazard.
May be violently or explosively reactive. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways. Consider evacuation.
No smoking, flames or ignition sources. Increase ventilation.
Contain spill with sand, earth or other clean, inert materials.
NEVER use organic absorbents such as sawdust, paper, cloth; as fire may result. Avoid any contamination by organic matter.
Use spark-free and explosion-proof equipment.
Collect any recoverable product into labeled containers for possible recycling. DO NOT mix fresh with recovered material.
Collect residues and seal in labeled drums for disposal.
Wash area and prevent runoff into drains. Decontaminate equipment and launder all protective clothing before storage and reuse.
If contamination of drains or waterways occurs advise emergency services.
DO NOT USE WATER OR NEUTRALIZING AGENTS INDISCRIMINATELY ON LARGE SPILLS.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid generating and breathing mist. Do not allow clothing wet with material to stay in contact with skin.
Avoid all personal contact, including inhalation.
Wear protective clothing when risk of exposure occurs.
Use in a well-ventilated area.
WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
Avoid smoking, bare lights or ignition sources.
Avoid contact with incompatible materials.
When handling, DO NOT eat, drink or smoke.
Keep containers securely sealed when not in use. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately.
Launder contaminated clothing before reuse.
Use good occupational work practices. Observe manufacturer's storing and handling recommendations. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Recommended Storage Methods: Stainless steel drum. Check that containers are clearly labeled.
Packaging as recommended by manufacturer.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use in a well-ventilated area.
Local exhaust ventilation may be required for safe working, i. e. , to keep exposures below required standards; otherwise, PPE is required.
If risk of overexposure exists, wear NIOSH-approved respirator.
Correct fit is essential to obtain adequate protection.
In confined spaces where there is inadequate ventilation, wear full-face air supplied breathing apparatus.

Personal Protective Clothing/Equipment:

Eyes: Chemical goggles. Full face shield.
DO NOT wear contact lenses. Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Bare unprotected skin should not be exposed to this material. Impervious, gauntlet length gloves i.e., butyl rubber gloves or Neoprene rubber gloves or wear chemical protective gloves, e.g. PVC.

Wear safety footwear or safety gumboots, e.g. Rubber.

Respiratory Protection:

Exposure Range >2 to <25 ppm: Supplied Air, Constant Flow/Pressure Demand, Half Mask

Exposure Range 25 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face

Other: Operators should be trained in procedures for safe use of this material.

Acid-resistant overalls or Rubber apron or PVC apron.

Ensure there is ready access to an emergency shower.

Ensure that there is ready access to eye wash unit.

Ensure that there is ready access to breathing apparatus.

Glove Selection Index:

BUTYL ..... Best selection
HYPALON ..... Best selection
NEOPRENE..... Best selection
NEOPRENE/NATURAL..... Best selection
PE/EVAL/PE ..... Best selection
SARANEX-23 ..... Best selection
NATURAL RUBBER..... Satisfactory; may degrade after 4 hours continuous immersion
NATURAL+NEOPRENE..... Satisfactory; may degrade after 4 hours continuous immersion
PVC..... Poor to dangerous choice for other than short-term immersion
NITRILE+PVC..... Poor to dangerous choice for other than short-term immersion

Section 9 - Physical and Chemical Properties

Appearance/General Info: Clear, colorless to slightly yellow liquid. Sharp strong odor.
CAUTION: exothermic dilution hazard.
HIGHLY CORROSIVE. Corrosive to most metals. Powerful oxidizing agent.
Darkens to brownish color on aging and exposure to light.

Physical State: Liquid
Odor Threshold: 0.75 to 2.50 mg/m^3
Vapor Pressure (kPa): 8.26
Vapor Density (Air=1): 1.5
Formula Weight: 63.02
Specific Gravity (H_2O=1, at 4 °C): 1.3-1.42
pH: < 1

pH (1% Solution): 1
Boiling Point: 83 °C (181 °F) at 760 mm Hg
Freezing/Melting Point: -42 °C (-43.6 °F)
Volatile Component (% Vol): 100 (nominal)
Decomposition Temperature (°C): Not applicable
Water Solubility: Soluble in all proportions

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Presence of heat source and direct sunlight. Storage in unsealed containers. Hazardous polymerization will not occur.

Storage Incompatibilities: Segregate from reducing agents, finely divided combustible materials, combustible materials, sawdust, metals and powdered metals.

Avoid contamination of water, foodstuffs, feed or seed.

Segregate from alkalies, oxidizing agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

Section 11 - Toxicological Information

Toxicity

Oral (human) LD_{Lo}: 430 mg/kg
Inhalation (rat) LC_{50}: 2500 ppm/1 hr
Unreported (man) LD_{Lo}: 110 mg/kg

Irritation

Nil reported

See *RTECS* QU 5775000, for additional data.

Section 12 - Ecological Information

Environmental Fate: No data found.

Ecotoxicity: LC_{50} Starfish 100-300 mg/l/48 hr /Aerated water conditions; LC_{50} Shore crab 180 mg/l/48 hr /Static, aerated water conditions; LC_{50} Cockle 330-1000 mg/l/48 hr /Aerated water conditions

BCF: no food chain concentration potential

Biochemical Oxygen Demand (BOD): none

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible. Special hazards may exist - specialist advice may be required.
Consult manufacturer for recycling options.
Follow applicable federal, state, and local regulations.
Treat and neutralize at an approved treatment plant.
Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
Puncture containers to prevent reuse and bury at an authorized landfill.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Note: This material has multiple possible HMT entries. Choose the appropriate one based on state and condition of specific material when shipped.

Shipping Name and Description: Nitric acid *other than red fuming, with more than 70 percent nitric acid*

ID: UN2031
Hazard Class: 8 - Corrosive material
Packing Group: I - Great Danger
Symbols:
Label Codes: 8 - Corrosive, 5.1 - Oxidizer
Special Provisions: B47, B53, T10, TP2, TP12, TP13
Packaging: **Exceptions:** None **Non-bulk:** 158 **Bulk:** 243
Quantity Limitations: **Passenger aircraft/rail:** Forbidden **Cargo aircraft only:** 2.5 L
Vessel Stowage: **Location:** D **Other:** 44, 66, 89, 90, 110, 111

Shipping Name and Description: Nitric acid *other than red fuming, with not more than 70 percent nitric acid*

ID: UN2031
Hazard Class: 8 - Corrosive material
Packing Group: II - Medium Danger
Symbols:
Label Codes: 8 - Corrosive
Special Provisions: B2, B47, B53, IB2, T8, TP2, TP12
Packaging: **Exceptions:** None **Non-bulk:** 158 **Bulk:** 242
Quantity Limitations: **Passenger aircraft/rail:** Forbidden **Cargo aircraft only:** 30 L
Vessel Stowage: **Location:** D **Other:**

Shipping Name and Description: Nitric acid, red fuming

ID: UN2032
Hazard Class: 8 - Corrosive material
Packing Group: I - Great Danger
Symbols: + - Override definitions
Label Codes: 8 - Corrosive, 5.1 - Oxidizer, 6.1 - Poison *or* Poison Inhalation Hazard *if inhalation hazard, Zone A or B*
Special Provisions: 2, B9, B32, B74, T20, TP2, TP12, TP13, TP38, TP45
Packaging: **Exceptions:** None **Non-bulk:** 227 **Bulk:** 244
Quantity Limitations: **Passenger aircraft/rail:** Forbidden **Cargo aircraft only:** Forbidden
Vessel Stowage: **Location:** D **Other:**

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Listed per CWA Section 311(b)(4) 1000 lb (453.5 kg)
SARA 40 CFR 372.65: Listed
SARA EHS 40 CFR 355: Listed
RQ: 1000 lb
TPQ: 1000 lb
TSCA: Listed

Section 16 - Other Information

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Group, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

1 Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· **Trade name: ALCONOX**

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.

· **Application of the substance / the mixture:** Cleaning material/ Detergent

· **1.3 Details of the supplier of the Safety Data Sheet**
· **Manufacturer/Supplier:**
Alconox, Inc.
30 Glenn St., Suite 309
White Plains, NY 10603
Phone: 914-948-4040
· **Further information obtainable from:** Product Safety Department

· **1.4 Emergency telephone number:**
ChemTel Inc.
(800)255-3924, +1 (813)248-0585

2 Hazards identification

· **2.1 Classification of the substance or mixture**
· **Classification according to Regulation (EC) No 1272/2008**

GHS05 corrosion
Eye Dam. 1; H318: Causes serious eye damage.

GHS07
Skin Irrit. 2; H315: Causes skin irritation.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Xi; Irritant
R38-41: Irritating to skin. Risk of serious damage to eyes.
· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.
The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.

(Contd. on page 2)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 1)

· **Hazard pictograms**

GHS05

· **Signal word:** Danger

· **Hazard-determining components of labelling:**
sodium dodecylbenzene sulfonate

· **Hazard statements**
H315: Causes skin irritation.
H318: Causes serious eye damage.

· **Precautionary statements**
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P264: Wash thoroughly after handling.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.
P321: Specific treatment (see on this label).
P362: Take off contaminated clothing and wash before reuse.
P332+P313: If skin irritation occurs: Get medical advice/attention.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.

· **Hazard description:**

· **WHMIS-symbols:**
D2B - Toxic material causing other toxic effects

· **NFPA ratings (scale 0 - 4)**

Health = 1
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 1
Fire = 0
Reactivity = 0

· **HMIS Long Term Health Hazard Substances**
None of the ingredients is listed.

· **2.3 Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

(Contd. on page 3)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 2)

3 Composition/information on ingredients

· **3.2 Mixtures**
· **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**		
CAS: 68081-81-2	sodium dodecylbenzene sulfonate Xn R22; Xi R36 Acute Tox. 4, H302; Eye Irrit. 2, H319	10-25%
CAS: 497-19-8 EINECS: 207-838-8 Index number: 011-005-00-2	Sodium Carbonate Xi R36 Eye Irrit. 2, H319	2,5-10%
CAS: 7722-88-5 EINECS: 231-767-1	tetrasodium pyrophosphate substance with a Community workplace exposure limit	2,5-10%
CAS: 151-21-3 EINECS: 205-788-1	sodium dodecyl sulphate Xn R21/22; Xi R36/38 Acute Tox. 4, H302; Acute Tox. 4, H312; Skin Irrit. 2, H315; Eye Irrit. 2, H319	2,5-10%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

· **4.1 Description of first aid measures**
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.
· **After eye contact:**
Remove contact lenses if worn.
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Rinse out mouth and then drink plenty of water.
Do not induce vomiting; call for medical help immediately.
· **4.2 Most important symptoms and effects, both acute and delayed**
No further relevant information available.
· **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:**
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

(Contd. on page 4)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 3)

· **5.2 Special hazards arising from the substance or mixture:** No further relevant information available.
· **5.3 Advice for firefighters**
· **Protective equipment:**
Wear self-contained respiratory protective device.
Wear fully protective suit.
· **Additional information:** No further relevant information available.

6 Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Product forms slippery surface when combined with water.
· **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **6.3 Methods and material for containment and cleaning up:**
Pick up mechanically.
Clean the affected area carefully; suitable cleaners are:
Warm water
· **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **7.1 Precautions for safe handling**
Prevent formation of dust.
Keep receptacles tightly sealed.
· **Information about fire - and explosion protection:** No special measures required.

· **7.2 Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Protect from humidity and water.
· **7.3 Specific end use(s):** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**	
7722-88-5 tetrasodium pyrophosphate	
REL (USA)	5 mg/m³
TLV (USA)	TLV withdrawn
EV (Canada)	5 mg/m³

(Contd. on page 5)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 4)

· **Additional information:** The lists valid during the making were used as basis.

· **8.2 Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the skin.
Avoid contact with the eyes and skin.
· **Respiratory protection:**
Not required under normal conditions of use.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
· **Protection of hands:**


Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.
· **Material of gloves**
Butyl rubber, BR
Nitrile rubber, NBR
Natural rubber, NR
Neoprene gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**


Safety glasses

· **Body protection:** Protective work clothing

(Contd. on page 6)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 5)

9 Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Powder
Colour:	White
· **Odour:**	Odourless
· **Odour threshold:**	Not determined.
· **pH-value (10 g/l) at 20 °C:**	9,5 (- NA for Powder form)
· **Change in condition**	
Melting point/Melting range:	Not Determined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not determined.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Self-igniting:**	Product is not self-igniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapour pressure:**	Not applicable.
· **Density at 20 °C:**	1,1 g/cm³
· **Relative density**	Not determined.
· **Vapour density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with water:**	Soluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
· **Solvent content:**	
Organic solvents:	0,0 %
Solids content:	100 %
· **9.2 Other information**	No further relevant information available.

(Contd. on page 7)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 6)

10 Stability and reactivity

· **10.1 Reactivity**
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **10.3 Possibility of hazardous reactions**
Reacts with acids.
Reacts with strong alkali.
Reacts with strong oxidizing agents.
· **10.4 Conditions to avoid:** No further relevant information available.
· **10.5 Incompatible materials:** No further relevant information available.
· **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Phosphorus compounds
Sulphur oxides (SOx)

11 Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **On the skin:** Irritant to skin and mucous membranes.
· **On the eye:** Strong irritant with the danger of severe eye injury.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Irritant
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

12 Ecological information

· **12.1 Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **12.2 Persistence and degradability:** No further relevant information available.
· **12.3 Bioaccumulative potential:** Not worth-mentioning accumulating in organisms
· **12.4 Mobility in soil:** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water.
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
· **12.5 Results of PBT and vPvB assessment**
· **PBT:** Not applicable.

(Contd. on page 8)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 7)

· **vPvB:** Not applicable.
· **12.6 Other adverse effects:** No further relevant information available.

13 Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation**
Smaller quantities can be disposed of with household waste.
Small amounts may be diluted with plenty of water and washed away. Dispose of bigger amounts in accordance with Local Authority requirements.
The surfactant used in this product complies with the biodegradability criteria as laid down in Regulation (EC) No. 648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.

· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

14 Transport information

· **14.1 UN-Number** · **DOT, ADR, IMDG, IATA, ICAO**	Not Regulated
· **14.2 UN proper shipping name** · **DOT, ADR, IMDG, IATA, ICAO**	Not Regulated
· **14.3 Transport hazard class(es)**	
· **DOT, ADR, IMDG, IATA, ICAO** · **Class**	Not Regulated
· **14.4 Packing group** · **DOT, ADR, IMDG, IATA, ICAO**	Not Regulated
· **14.5 Environmental hazards:** · **Marine pollutant:**	No
· **14.6 Special precautions for user**	Not applicable.
· **14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **UN "Model Regulation":**	Not Regulated

(Contd. on page 9)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 8)

15 Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **United States (USA)**
· **SARA**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.
· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.
· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65 (California):**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.
· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.
· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.
· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Carcinogenic Categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.
· **IARC (International Agency for Research on Cancer)**
None of the ingredients is listed.
· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.
· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

(Contd. on page 10)

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Printing date: 31.12.2013 **Revision:** 31.12.2013

Trade name: ALCONOX

(Contd. of page 9)

· **Canada**

· **Canadian Domestic Substances List (DSL)**	
All ingredients are listed.	
· **Canadian Ingredient Disclosure list (limit 0.1%)**	
None of the ingredients is listed.	
· **Canadian Ingredient Disclosure list (limit 1%)**	
497-19-8	Sodium Carbonate
7722-88-5	tetrasodium pyrophosphate
151-21-3	sodium dodecyl sulphate

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**
H302: Harmful if swallowed.
H312: Harmful in contact with skin.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
R21/22: Harmful in contact with skin and if swallowed.
R22: Harmful if swallowed.
R36: Irritating to eyes.
R36/38: Irritating to eyes and skin.

· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)

APPENDIX E

Example Loss Prevention Observation Form

ARCADIS
Infrastructure, environment, facilities

Loss Prevention Observation

Observer Name	Observer Title	Project/Project Number

Date _____ Time ____ ☐ AM ☐ PM	Project Type / Task Observed

Background Information

List Critical Work Procedures

List Issue/Items Requiring Corrective Action

Root Cause Analysis

1. Employee lacks the skill or knowledge to carry out duties
2. Procedures, work standards, or expectations were not communicated
3. Procedures or work standards were not developed or were inadequate
4. Equipment, systems, or tools were inadequate
5. Employee chose not to take the time or put forth the effort to do the job properly
6. Supervisor did not require the employee to follow the standard procedure
7. Employee doesn't see any advantage to doing the job to standard
8. Uncontrollable

Criterion #	RCA #	Corrective Action Identified	Responsible Individual	Due Date	Closure Date

Results of Corrective Action

Reviewed by	Date	Reviewed by	Date

Environmental Operations

ARCADIS
Infrastructure, environment, facilities

	PRE-TASK PREPARATION	Correct	Questionable	Comments
1.	Health and Safety Plan / MSDSs on site			
2.	Employee familiar / trained on task			
3.	OSHA-required training/medical surveillance			
4.	Utility mark out / check performed			
5.	Traffic hazard addressed / work area marked			
6.	Walking / working surfaces free of hazards			
7.	Tailgate safety meeting performed			
8.	Impact on nearby residence/business evaluated			
9.	Communicates intentions to other personnel			
10.	Knowledge of emergency procedures			
11.	Distance between equipment and power lines			
12.	Personal protective equipment			
13.	Air monitoring equipment on site, calibrated			
14.	First aid kit / fire extinguisher on site			
15.	One person trained in first aid / CPR			
16.	Work zones established and marked			
	PERFORMING TASK			
17.	Employee trained in task to be performed			
18.	Correct body positioning			
19.	Proper lifting / pushing / pulling techniques			
20.	Keep hands / body away from pinch points			
21.	Walking / working surfaces kept clear of debris			
22.	Faces traffic as appropriate			
23.	Vehicles/ barricades to protect against traffic			
24.	Drill rig located properly, blocked / chocked			
25.	Drill rig moved only with derrick lowered			
26.	Excavator located on stable ground			
27.	Eye contact made with equipment operator			
28.	Spoil at least 2 feet back from edge of excavation			
29.	Excavation shored/sloped/benched			
30.	Excavation entry controlled			
31.	Equipment/tools used properly			
32.	Electrical equipment connected through GFCI			
33.	Power tools handled properly			
34.	Electrical cords inspected / in good condition			
35.	Follows lockout / tagout procedures			
36.	Air monitoring conducted/action levels understood			
37.	Equipment decontaminated properly			
38.	Personnel decon prior to eating/drinking/smoking			
39.	Decontamination effective			
	POST – TASK			
40.	Procedures / JSA adequate			
41.	Equipment / tools stored properly			
42.	Proper storage of soil / water / waste material			
43.	Work area secured			
44.	Other			

ARCADIS
Infrastructure, environment, facilities

Loss Prevention Observation Form

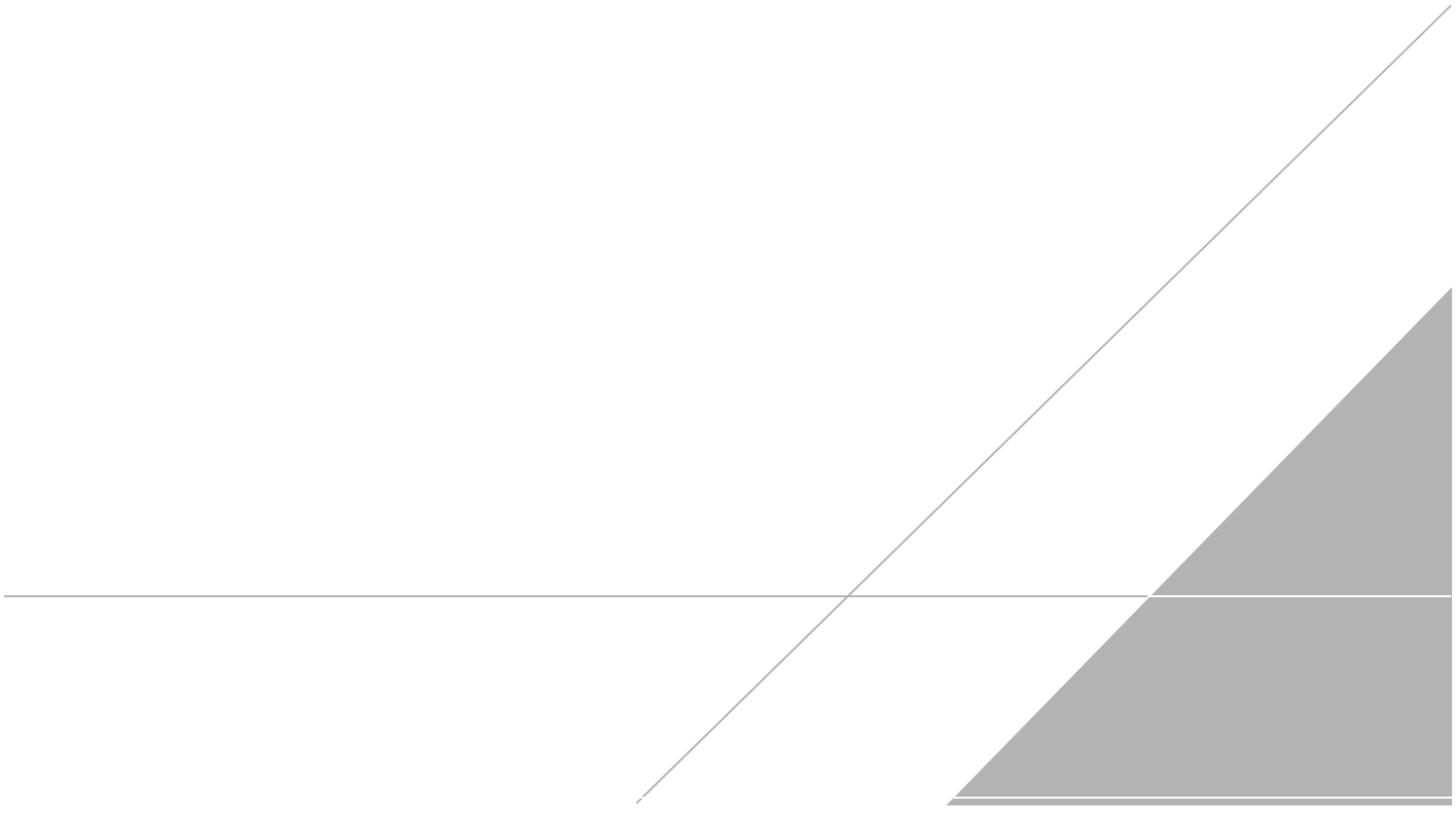
Environmental Operations

	PRE-TASK PREPARATION	Correct	Questionable	Comments
1.	Are Health and Safety Plan / MSDSs on site?			
2.	Is the employee familiar / trained on task?			
3.	OSHA-required training / medical surveillance?			
4.	Was utility mark out / check performed?			
5.	Was traffic hazard addressed / work area marked?			
6.	Are walking / working surfaces free of hazards?			
7.	Was the tailgate safety meeting performed?			
8.	Was SPSA performed prior to beginning work?			
9.	Communicates intentions to other personnel?			
10.	Knowledge of emergency procedures?			
11.	Distance between equipment and power lines?			
12.	Personal protective equipment?			
13.	Air monitoring equipment on site, calibrated?			
14.	Is a first aid kit / fire extinguisher on site?			
15.	Is one person trained in first aid / CPR?			
16.	Are work zones established and marked?			
	PERFORMING TASK			
17.	RSA before beginning new task?			
18.	Correct body positioning?			
19.	Proper lifting / pushing / pulling techniques?			
20.	Keep hands / body away from pinch points?			
21.	Are walking / working surfaces kept clear of debris?			
22.	Faces traffic as appropriate?			
23.	Do vehicles / barricades exist to protect against traffic?			
24.	Is the drill rig located properly, blocked / chocked?			
25.	Is the drill rig moved only with derrick lowered?			
26.	Is the excavator located on stable ground?			
27.	Is eye contact made with			

	equipment operator?			
28.	Is spoil at least 2 feet back from edge of excavation?			
29.	Is the excavation shored / sloped / benched?			
30.	Is the excavation entry controlled?			
31.	Are equipment / tools used properly?			
32.	Is electrical equipment connected through GFCI?			
33.	Are power tools handled properly?			
34.	Are electrical cords inspected / in good condition?			
35.	Follows lockout / tagout procedures?			
36.	Air monitoring conducted / action levels understood?			
37.	Was equipment decontaminated properly?			
38.	Were personnel decontaminated prior to eating / drinking / smoking?			
39.	Was the decontamination effective?			
	POST – TASK			
40.	Procedures / JSA adequate?			
41.	Are equipment / tools stored properly?			
42.	Proper storage of soil / water / waste material?			
43.	Is the work area secured?			
44.	Other?			
	Total #		**% Safe:** (Total Correct/[Total Correct + Total Questionable]) * 100]	

APPENDIX F

Example Incident Investigation Report



ARCADIS
Infrastructure, environment, facilities

Incident/Near-Miss Investigation Report

☐ OSHA Recordable	☐ First Aid Injury	☐ Fire	Date of Incident:
☐ Lost Workday Injury	☐ Vehicle Accident	☐ Spill / Leak	
☐ Restricted Duty Injury	☐ Equipment Damage	☐ Near Miss	Incident Number:

Every employee injury, accident, and near miss must be reported within 24 hours of the injury. If the incident results in hospitalization, an immediate report must be made by telephone to the Project Manager and the Health and Safety Officer.

Project Information

Project Name:	Project #
Location of Incident:	

Employee

Name:	Employee Number:
Employment Status: ☐ Regular ☐ Part Time	How long in present job?

Injury or Illness Information

Where did the incident / near miss occur? (number, street, city, state, zip):

Employee's specific activity at the time of the incident / near miss:

Equipment, materials, or chemicals the employee was using when the incident / near miss occurred (e.g., the equipment employee struck against or that struck the employee; the vapor inhaled or material swallowed; what the employee was lifting, pulling, etc.):

Describe the specific injury or illness (e.g., cut, strain, fracture, etc.):

Body part(s) affected (e.g., back, left wrist, right eye, etc.):

Name and address of treatment provider (e.g., physician or clinic):	Phone No.:
If hospitalized, name and address of hospital:	Phone No.:

Date of injury or onset of illness: / /	Time of event or exposure: ☐ AM ☐ PM

Did employee miss at least one full shift's work? ☐ No ☐ Yes, 1st date absent (MM/DD/YYYY) / /

Has employee returned to work? ☐ Regular work ☐ Restricted work ☐ No
☐ Yes, date returned (MM/DD/YYYY) / /

To whom reported:	Other workers injured / made ill in this event? ☐ Yes ☐ No

Description of Incident / Near Miss: (Describe what happened and how it happened.)

ARCADIS
Infrastructure, environment, facilities

Incident/Near-Miss Investigation Report

Motor Vehicle Accident (MVA)								
Company Vehicle?	☐ Yes ☐ No							
Accident Location (street, city, state)								
Vehicle Towed?	☐ Yes ☐ No	Other Vehicle?	☐ Yes ☐ No	# Vehicles Towed:		# of Injuries:		

Spill		
Material Spilled:	Quantity:	Source:
Agency Notifications:		
Cost of Incident $		

Third Party Incidents			
Name of Owner:		Address:	Telephone:
Description of Damage:			
Witness Name:		Address:	Telephone:
Witness Name:		Address:	Telephone:

#	Root Cause and Contributing Factors: Conclusion (Describe in Detail Why Incident / Near Miss Occurred)
1	
2	
3	
4	
5	

Root Cause(s) Analysis (RCA):

1. Lack of skill or knowledge.
2. Lack of or inadequate operational procedures or work standards.
3. Inadequate communication of expectations regarding procedures or work standards.
4. Inadequate tools or equipment.
5. Correct way takes more time and / or requires more effort.
6. Short-cutting standard procedures is positively reinforced or tolerated.
7. Person thinks there is no personal benefit to always doing the job according to standards.
8. Uncontrollable.

#	RCA #	Solution(s): How to Prevent Incident / Near Miss From Reoccurring	Person Responsible	Due Date	Closure Date

ARCADIS
Infrastructure, environment, facilities

Incident/Near-Miss Investigation Report

Investigation Team Members

Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date
	Project Manager	
	Health and Safety Reviewer	

APPENDIX G

Example Air Monitoring Log

ARCADIS
Infrastructure, environment, facilities

Air Monitoring Log

Project: **Date:**

Monitoring Instruments:

Air Monitor: **Activity:**

Level of Protection:

Time	Location	Instrument Reading	Comments

APPENDIX H

Example Daily Tailgate Safety Meeting Log

ARCADIS

Document Control Number:TGM - _____

TGM + *project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year*

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name:			**Project Location:**
Date:	**Time:**	**Conducted by:**	**Signature/Title:**
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 _____ 3 _____ 5 _____

2 _____ 4 _____ 6 _____

Other Hazardous Activities - Check the box if there are any other ARCADIS, Client or other party activities that may pose hazards to ARCADIS operations ☐ If there are none, write "None" here: _____

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Any Stop Work Interventions yesterday?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ If deviations, notify PM & client
☐ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☐ All equipment checked & OK?
☐ Staff has appropriate PPE?	☐ Staff knows Emergency Plan (EAP)?	☐ Staff knows gathering points?

☐ Topics from Corp H&S to cover?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

☒	**STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)				
☐	Elimination	☐	Substitution	☐	Isolation
☐	Engineering controls	☐	Administrative controls	☐	Monitoring
☐	General PPE Usage	☐	Hearing Conservation	☐	Respiratory Protection
☐	Personal Hygiene	☐	Exposure Guidelines	☐	Decon Procedures
☐	Emergency Action Plan (EAP)	☐	Fall Protection	☐	Work Zones/Site Control
☐	JSA to be developed/used ***(specify)***	☐	TIP conducted ***(specify job/JSA)***	☐	Traffic Control
☐		☐		☐	Other ***(specify)***
☐		☐		☐	

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.800.455.6155 and then notify the field supervisor who will, in turn, notify Corp H&S at 1.720.344.3844.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify Corp H&S at 1.720.344.3844 and then Corp Legal at 1.720.344.3756.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify Corp Legal at 1.678.373.9556 and Corp H&S at 1.720.344.3500

Visitor Name/Co - not involved in work

	In	Out
	In	Out
	In	Out
	In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- ☐ Lessons learned and best practices learned today: _____
- ☐ Incidents that occurred today: _____
- ☐ Any Stop Work interventions today? _____
- ☐ Corrective/Preventive Actions needed for future work: _____
- ☐ Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.800.455.6155

Arcadis U.S., Inc.

295 Woodcliff Drive

Third Floor

Suite 301

Fairport, New York 14450

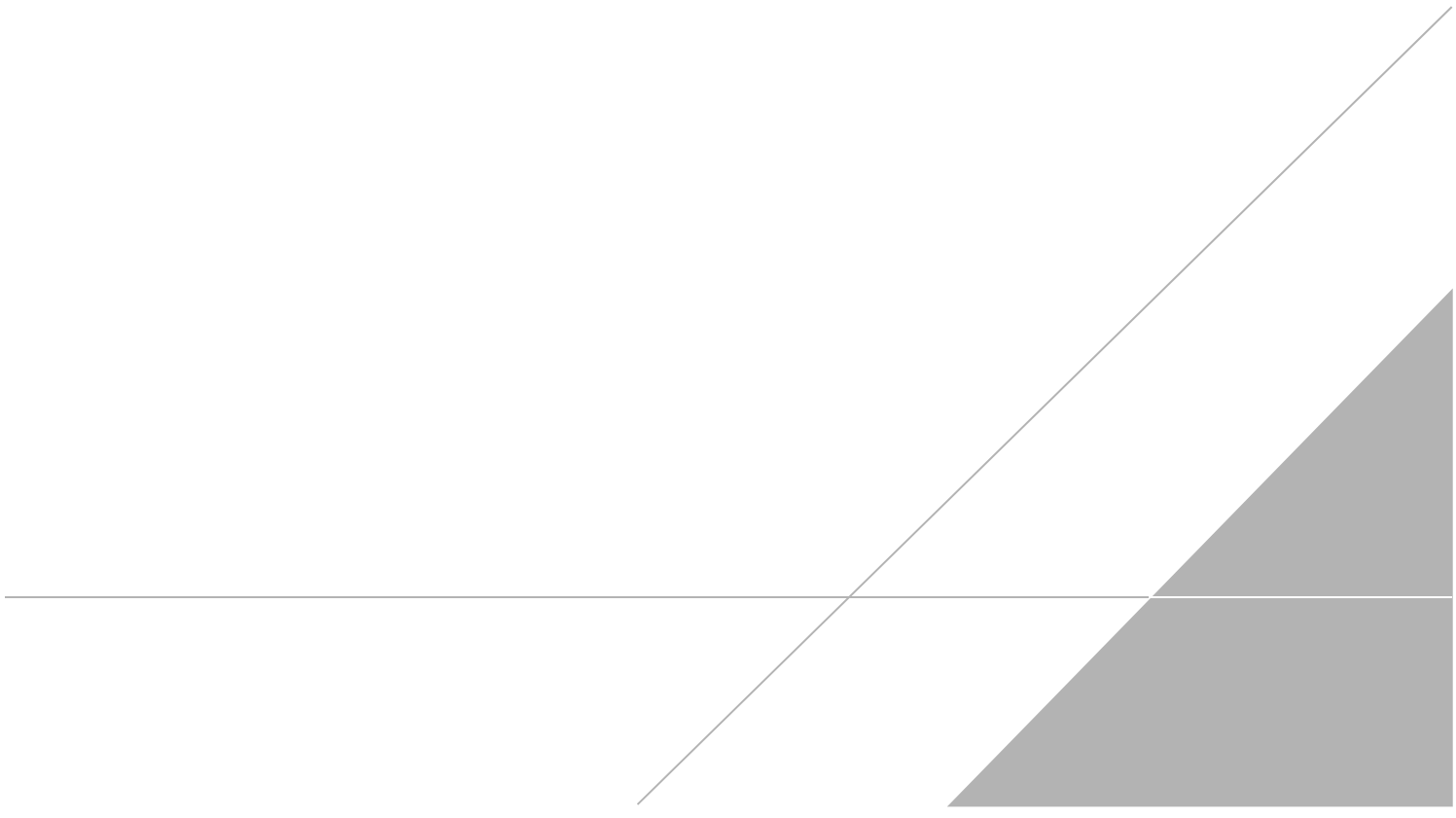
Tel 585 385 0090

Fax 585 385 4198

www.arcadis.com

Appendix H

NYSDOH Generic Community Air Monitoring Plan



APPENDIX H

New York State Department of Health

Generic Community Air Monitoring Plan

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 volatile organic compounds (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 require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/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. 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.

- 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.

- 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.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) 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.

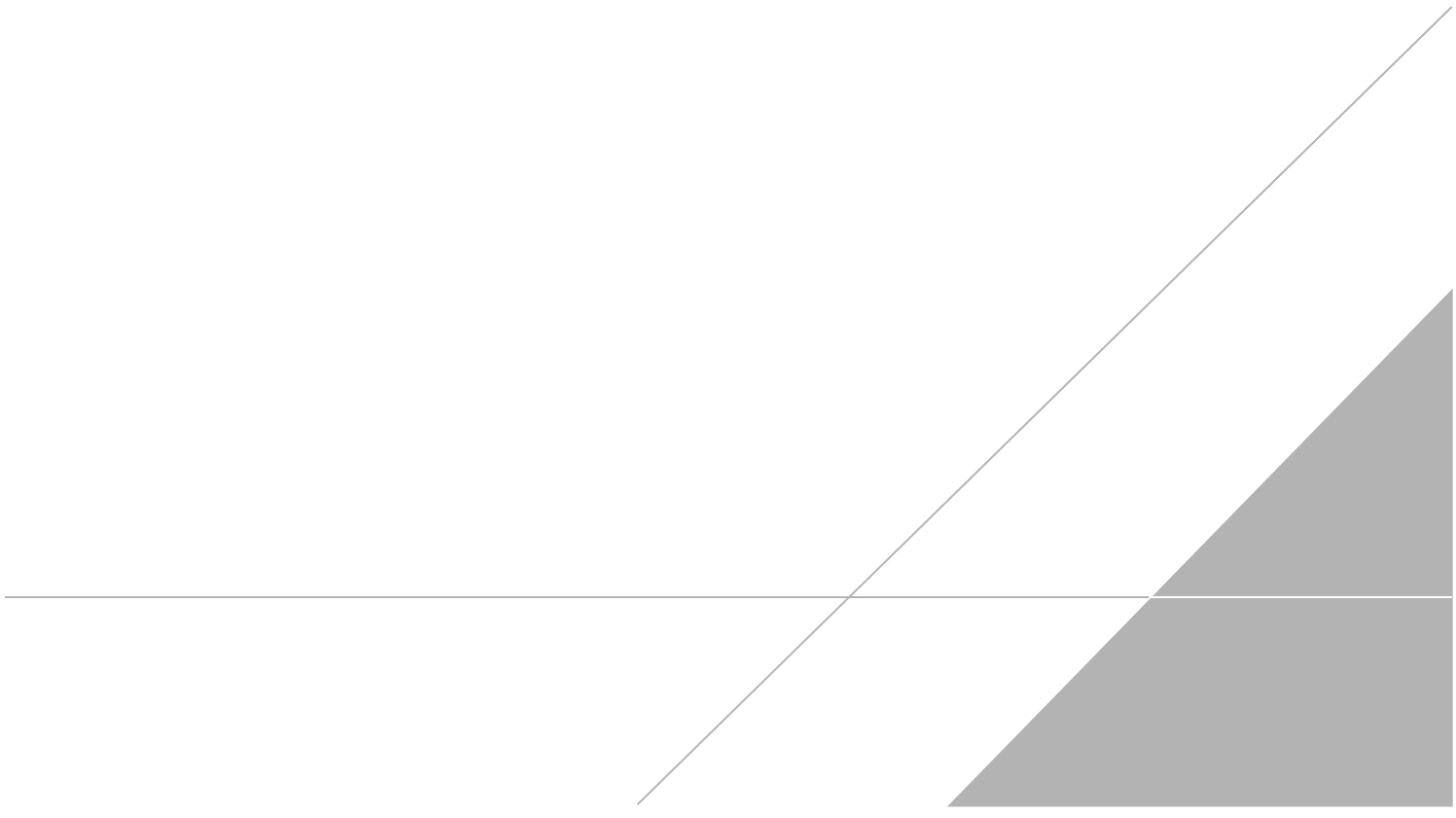
- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques 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.

- 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.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

Appendix I

Site Inspection Form



Site Inspection Form
Park Street Former MGP Site - Geneseo, New York

Date/Time: _____ Weather: _____

Personnel: _____ Temperature: _____

General Requirements

Photographs will be attached to document the condition of each inspection item identified below. A written description of any item(s) that is considered to be in poor condition is required.

1. General Site Conditions:

Monitoring wells	☐ Good	☐ Poor*
Cover Areas (Pavement)	☐ Good	☐ Poor*
Cover Areas (Sidwalk)	☐ Good	☐ Poor*
Cover Areas (Grass/Landscaping)	☐ Good	☐ Poor*
Signs of intrusive activities	☐ No	☐ Yes*
Evidence of Settlement	☐ No	☐ Yes*

Note:
-Cover area inspection is to determine if intrusive activities may have occurred since the previous site visit.

2. Site Cover Systems:

Borrowing/Depressions	☐ No	☐ Yes*
Standing Water	☐ No	☐ Yes*
Missing Asphal/Sidewalk	☐ No	☐ Yes*
Vegetative Growth (Other than grass/landscaped areas)	☐ No	☐ Yes*
Evidence of Settlement	☐ No	☐ Yes*
Sedimentation	☐ No	☐ Yes*
Damage/Failure	☐ No	☐ Yes*

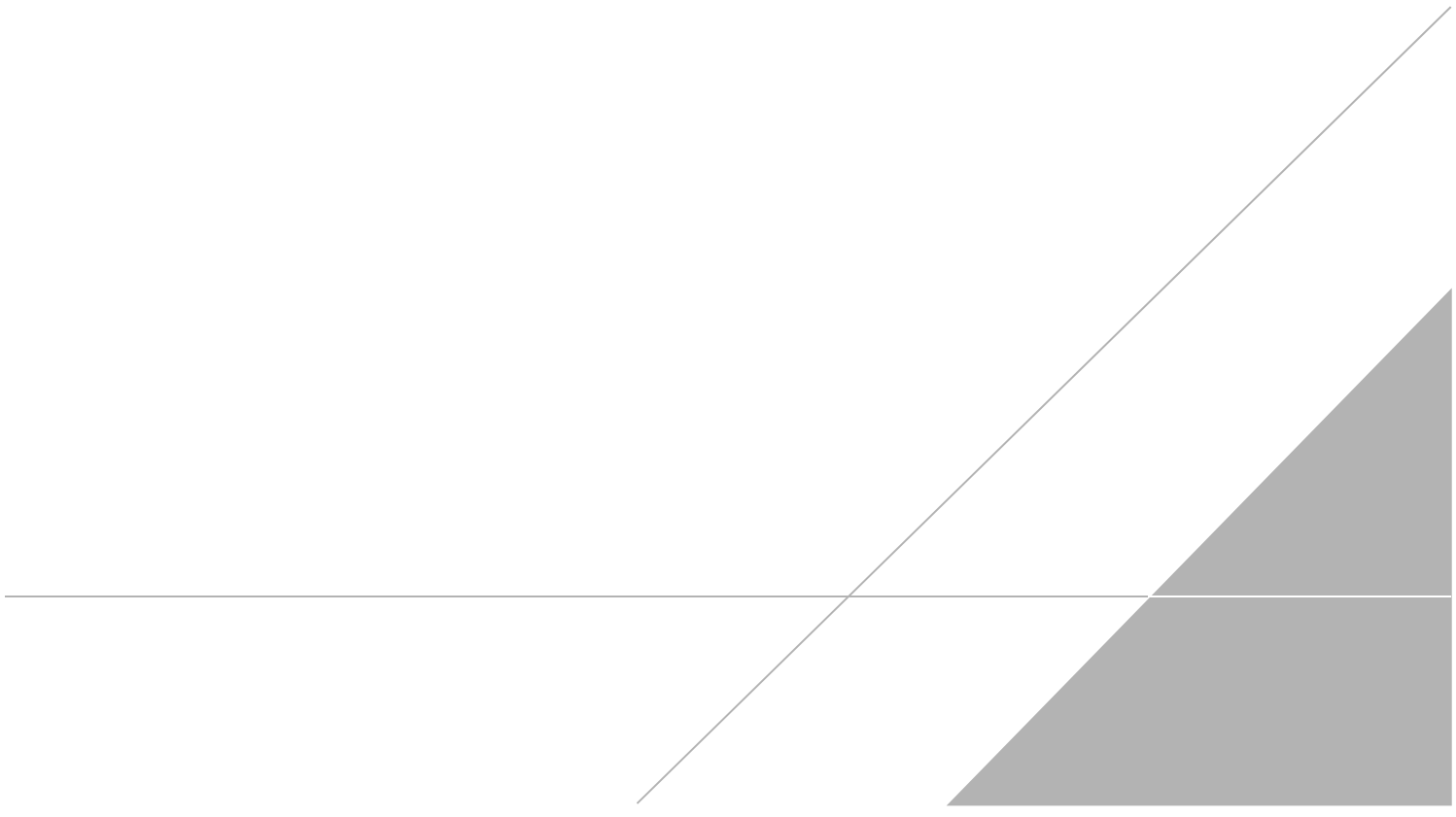
3. Notes:

Site Inspection Form
Park Street Former MGP Site - Geneseo, New York

* Indicates condition should be reported to NYSEG Project Manager/OM&M Coordinator.

Appendix J

Responsibilities of Owner and Responsible Party



APPENDIX J

RESPONSIBILITIES of

OWNER and REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan (SMP) for the Park Street Former MGP site (site), NYSDEC Site Number V00731, are shared between the site owner and a Remedial Party, as defined below. The owner is currently listed as:

Owner:	New York State, SUNY at Geneseo
Contact:	Mr. Chuck Reyes, CHMM, CHO SUNY at Geneseo 1 College Circle Geneseo, New York 14454 Telephone: 585.245.5512

Solely for the purposes of this document and based upon the facts related to this particular site and the remedial program being carried out, the term Remedial Party (RP) refers to:

RP:	Rochester Gas and Electric Company
Contact:	Mr. Jeremy Wolf 1300 Scottsville Road Rochester, New York 14624 Telephone: 585.724.8548

Nothing on this page shall supersede the provisions of an Environmental Easement, Decision Document, agreement, or other legally binding document that affects rights and obligations relating to the site.

Site Owner's Responsibilities:

1. The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the site.
2. In the event the site is delisted, the owner remains bound by the Environmental Easement and shall submit, upon request by the NYSDEC, a written certification that the Environmental Easement is still in place and, to the best of their knowledge, has been complied with.
3. The owner shall grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.
4. The owner is responsible for maintaining the security of the remedial components located

on its property to the best of its ability. In the event that damage to the remedial components (i.e., monitoring wells) or vandalism is evident, the owner shall notify the site's RP and the NYSDEC in accordance with the timeframes indicated in **Section 1.3** (Notifications) of the SMP.

5. In the event some action or inaction by the owner adversely impacts the site, the owner must notify the site's RP and the NYSDEC in accordance with the time frame indicated in **Section 1.3** (Notifications) of the SMP and (ii) coordinate the performance of necessary corrective actions with the RP.
6. The owner must notify the RP and the NYSDEC of any change in ownership of the site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the site property/ies. The SMP contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following:
    - Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section.
    - Notification requirements for a change in use are detailed in **Section 2.4** of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

Remedial Party Responsibilities:

1. The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the site.
2. The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.
3. Before accessing the site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the site visit and/or any final report produced.
4. If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 10 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).
5. The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or

control, and of any changes in the party/entity responsible for the maintenance and monitoring of, and reporting with respect to any remedial system (Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html .

6. The RP shall notify the NYSDEC of any damage to or modification of the monitoring well network/system as required under **Section 1.3** (Notifications) of the SMP.
7. Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.
8. Any change in use, change in ownership, change in site classification, reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.

Change in RP ownership and/or control and/or site ownership does not affect the RP's obligations with respect to the site unless a legally binding document executed by the NYSDEC releases the RP of its obligations. Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.