SITE MANAGEMENT PLAN

FORMER BROWN MANUFACTURING SITE

ONONDAGA COUNTY

CITY OF SYRACUSE, NEW YORK

NYSDEC Site Number: B00024
USEPA ID # NYR000223016

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 7
615 Erie Boulevard West
Syracuse, NY 13204

and

City of Syracuse
203 City Hall
233 E Washington Street
Syracuse, NY 13202

Prepared by:

Parsons Engineering of New York, Inc.
301 Plainfield Road, Suite 350
Syracuse, NY 13212
(315) 451-9560

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
1	07/23/2018	Rev. Section 4.2 & App I - Site Inspection Form	09/14/2018

MAY 2018

The following is hereby added to Section 4.2 of the Site Management Plan for the Former Brown Manufacturing Site, dated May 2018, prepared by Parsons Engineering of New York, Inc. (SMP):

Section 4.2 – Site Wide Inspection

If any portion of the areas that were inaccessible for construction of a cover system become accessible, a cover system will be constructed over the newly accessible area at that time. The affected areas are described in Section 4.8 of the Final Engineering Report, dated May 2018, prepared by Parsons Engineering of New York, Inc. The cover system will comply with the requirements for the site cover system as described in Section 3.3.1 of the SMP. The Excavation Work Plan in Appendix E of the SMP will be followed when work is conducted in/on these areas.

The site inspection form in Appendix I of the Site Management Plan for the Former Brown Manufacturing Site, dated May 2018, prepared by Parsons Engineering of New York, Inc. is hereby replaced with the attached inspection form.

COVER SYSTEM INSPECTION FORM
FORMER BROWN MANUFACTURING SITE

Inspector: _____ Date: _____

Event Type (circle one): Scheduled / Non-Routine

Site Use Inspection
Is site use consistent with Environmental Easement?

Sidewalk Inspection
Please note any observations of breaches in any concrete/sidewalks, which may include but are not limited to cracks, holes, indentations, vegetation growing through concrete etc.

Soil Inspection
Please note any observations of breaches in the soil cover, which may include but are not limited to holes and soil washout. Include a sketch identifying the location of defects. Is there evidence of any excavations? Describe and include a sketch of areas of disturbance.

Have any of the areas noted in Section 4.2 of the Site Management Plan Addendum dated July 2018 been disturbed? Are any of the areas noted in Section 4.2 of the Site Management Plan Addendum dated July 2018 now accessible for construction of a cover system?

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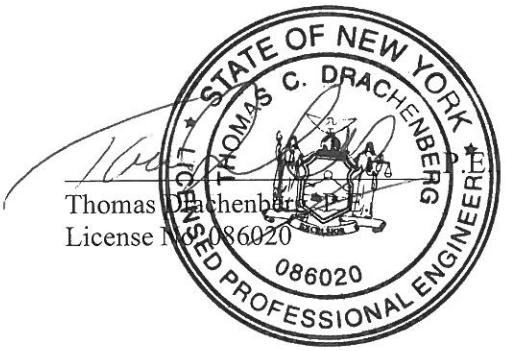
MAY 2018

CERTIFICATION STATEMENT

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



P.E

Thomas Drachenberg, P.E.
License No. 086020

05/14/18
DATE

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LIST OF ACRONYMS

CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulation
COC	Certificate of Completion
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
NYWII	New York Works II
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SVOC	Semi-Volatile Organic Compounds
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

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

Site Identification: B00024 Former Brown Manufacturing Site

Institutional Controls:	1. The property may be used for restricted residential use;
	2. All ECs must be maintained as specified in this SMP
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.
	4. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Onondaga Department of Health to render is safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
	5. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP.
	6. Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP.
	7. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
	8. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP.
	9. Operations, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP.
	10. Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable

	prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.	
	11. The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure 2, and any potential impacts that are identified must be monitored or mitigated.	
	12. Vegetable gardens and farming on the site are prohibited.	
Engineering Controls:	1. Cover system	
	2. Monitoring Wells associated with Monitored Natural Attenuation	
Inspections:		Frequency
1. Site inspection		Annually
Monitoring:		
1. Groundwater Monitoring Wells MW-1, MW-2, MW-3R, MW-4R		Annually
Reporting:		
1. Groundwater Sampling Report 2. Periodic Review Report		Annually Annually, or as specified by the NYSDEC

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

SECTION 1

INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Former Brown Manufacturing Site located in Syracuse, New York (hereinafter referred to as the "Site"). See Figure 1. The Site is currently in the New York State (NYS) Environmental Restoration Program (ERP) Site No. B00024 which is administered by New York State Department of Environmental Conservation (NYSDEC).

The City of Syracuse entered into a State Assistance Contract (SAC) #C300654 on March 9, 1998 with the NYSDEC to investigate the site. Subsequently, the City of Syracuse entered into an agreement (New York Works II [NYWII] ERP Agreement, Index No. NYWII-B00024-12-14) on March 26, 2015 with the NYSDEC which provided for the remediation of the site. A figure showing the site location and boundaries of this site is provided in Figure 2. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in Appendix A., and are depicted on the survey included in Appendix K.

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

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

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the NYWII ERP Agreement (Index #NYWII-B00024-12-14; Site #B00024) for the site, and thereby subject to applicable penalties.

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

This SMP was prepared by Parsons Engineering of New York, P.C., on behalf of the City of Syracuse and the NYSDEC, 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/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. 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 Environmental Easement 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 the property owner 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 NYWII ERP Agreement, 6NYCRR Part 375 and/or Environmental Conservation Law.

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

- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.

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

- 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/Remedial Party has been provided with a copy of the NYWII ERP Agreement, 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 on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

Table 1: Notifications*

Name	**Contact Information**
NYSDEC Project Manager Joshua Cook, P.E.	(315) 426-7411 joshua.cook@dec.ny.gov
NYSDEC Regional HW Engineer Harry Warner	315-426-7551 harry.warner@dec.ny.gov
NYSDEC Site Control Kelly Lewandowski	518-402-9553 kelly.lewandowski@dec.ny.gov

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

SECTION 2

SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in Syracuse, Onondaga County, New York and is identified as Section 086, Block 07 and Lot 31 on the City of Syracuse Tax Map (see Figure 3). The site is an approximately 0.8-acre area and is bounded by Bellevue Avenue with vacant residential properties and a community garden to the north, residential properties on Chester Street to the south, residential properties along Huron Street to the east, and Chester Street with residential properties and a supermarket beyond to the west (see Figure 2 – Site Layout Map). The boundaries of the site are more fully described in Appendix A –Environmental Easement, and are depicted on the survey included in Appendix K. The owner(s) of the site parcel(s) at the time of issuance of this SMP is/are:

- City of Syracuse

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: a vacant grass covered lot. The Site is zoned residential and is currently vacant.

The properties adjoining the Site and in the neighborhood surrounding the Site include residential properties, except for the properties to the west of the Site which include commercial and residential properties.

2.2.2 Geology

The unconsolidated deposits at the site include: a fill layer; a silty, sandy layer; a sand and gravel layer; and then silty, sandy layers. The top unit consists of fill ranging from one to up to 15 feet thick which is comprised of sand, crushed stone, concrete debris, brick, ash, cinders, wood and other debris. The fill was underlain by native glacioulacustrine deposits consisting of silt, sand and clay to depths ranging from approximately 8 feet to approximately 13 feet below grade. The glacioulacustrine unit was underlain by a sand and gravel layer which was present at a depth of approximately 8 feet below grade on the western portion of the site and approximately 13 feet below grade in the eastern portion of the site. Below the sand and gravel unit is another silty, sandy unit. The geology of the region generally consists of glacioulacustrine deposits, underlain by glacial till, with alluvial deposits present in areas around Onondaga Creek. Site specific boring logs for borings installed during the pre-design investigation in 2015 are provided in Appendix C. The locations of the borings are shown on the survey in Appendix K.

2.2.3 Hydrogeology

Groundwater at the site was generally encountered in or just above the sand and gravel unit. Along the western side of the site, it was present at approximately 8 to 9 feet below grade during the 2016 remedial action. In the eastern side of the site groundwater was present at about 11 to 13 feet below grade during the 2016 remedial action. Groundwater flows generally to the south-southeast, towards Onondaga Creek.

A groundwater contour map is shown in Figure 5. Groundwater gauging data is provided in Table 2. Groundwater monitoring well construction logs are provided in Appendix D.

2.3 Investigation and Remedial History

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

The Former Brown Manufacturing facility operated at the site from at least 1926, potentially as early as 1912, until approximately 1972 or 1973. In 1981, after reportedly being inactive for a number of years, the buildings on-site burned in a fire. Subsequent to the fire, several drums of oil contaminated with PCBs were removed from a disposal pit, quenching trough, and a ruptured electrical transformer at the site. After the fire and the removals, several rounds of sampling were conducted at the site. PCBs were detected in some of the samples. A remedial program has been implemented at the site, in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Part 375.

Between 1998 and 2009, a remedial investigation of the site was performed by the City of Syracuse under the Environmental Restoration Program (ERP). Based on the investigation performed, a remedy for the site was selected and documented in a Record of Decision (ROD), which was issued by the NYSDEC in March 2012 under the ERP.

The NYSDEC performed the remediation under the ERP pursuant to the NYWII ERP Agreement with the City (the Agreement).

Under the Agreement, additional data was collected in August and October 2015 by the NYSDEC through its engineering consultant, Parsons, to better define the areas to be excavated as required by the ROD.

The remedial design was carried out between 2016 and 2017 as required by the ROD and detailed in the Remedial Action Work Plan (Parsons, 2016). Soil was removed from the AOCs described in the ROD and clean fill was brought in to backfill. A delineation layer was laid over the site along with a minimum two-foot cover of clean fill

and top soil. Details of the remedial action can be found in the Final Engineering Report (Parsons, 2018).

2.4 REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs) for the Site as listed in the Record of Decision (ROD) dated March 2012 are as follows:

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

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

2.5 REMAINING CONTAMINATION

2.5.1 Soil

A summary of volatile organic compound (VOC) and semi-volatile organic compound (SVOC) results for post-excavation soil samples collected during remedial action activities are shown on Figure 6. Soil sample results are also summarized in Table 3.

Total VOC concentration in all subsurface soil samples ranged from non-detect to 10.7 ppm. Total SVOC concentrations in all subsurface soil samples ranged from non-detect to 128.3 ppm. The highest total VOC and SVOC concentrations were detected in AOC1-B2 and AOC1-B1 respectively. VOCs exceeded the 6 NYCRR Part 375 Restricted Residential SCOs in two samples, exceedances are detailed in Figure 6 and Table 3. Soil in the areas where the exceedances were noted was excavated to the extent practicable. Remaining contamination will be addressed through the monitoring of natural attenuation processes.

2.5.2 Groundwater

During the November 2017 groundwater sampling, one exceedance was detected in MW-2, chloroform was measured 11 ug/L which is higher than the NYSDEC Ambient Water Quality Class GA Groundwater Standards. A summary of volatile organic compound (VOC) and semi-volatile organic compound (SVOC) results are shown on Figure 7. Groundwater sample results are also summarized in Table 4.

During the Remedial Action, MW-3, MW-4, and MW-5 were destroyed. Two new monitoring wells (MW-3R and MW-4R) were installed to replace these wells. A new pad was also installed around MW-1.

SECTION 3

INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

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

This plan provides:

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

3.2 Institutional Controls

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

- The property may be used for restricted residential use, which also allows for commercial and industrial use, as those terms are defined at 6 NYCRR 375-1.8(g)(2);

- All ECs must be operated and maintained as specified in this SMP;

- All ECs must be inspected at a frequency and in a manner defined in the SMP.

- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Onondaga 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 contaminated material must be conducted in accordance with this SMP;

- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;

- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;

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

- The potential for vapor intrusion must be evaluated for any buildings developed in the area 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

3.3.1 Cover

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of a minimum of 24 inches of clean soil and concrete-covered sidewalks. Figure 4 presents the location of the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix E outlines the procedures required to be implemented in the event the cover system is

breached, penetrated or temporarily removed, and any underlying remaining 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 Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendix F.

3.3.2 Monitoring Wells associated with Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will be completed using the existing monitoring well network on an annual basis. Groundwater sampling procedures are outline din Appendix G – Field Sampling Plan. If appropriate based on the data obtained, site conditions, and site use, the NYSDEC and NYSDOH may modify the monitoring frequency and/or parameters.

3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.3.3.1 Cover

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity unless and until additional excavation is conducted or it is otherwise demonstrated that site soil meets the requirements of the current, intended or reasonably anticipated site use without a cover system.

3.3.3.2 Monitoring Wells associated with Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC with consultation with NYSDOH, until residual groundwater concentrations are found to be consistently below ambient water quality standards, the site SCGs, or have become asymptotic at an acceptable level over an extended period. In the event that monitoring data indicates that monitoring for natural attenuation may no longer be required, a proposal to discontinue the system will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

SECTION 4

MONITORING AND SAMPLING PLAN

4.1 General

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

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

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

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

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

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site – Wide Inspection

Site-wide inspections will be performed annually. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as

provided in Appendix I – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

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

Reporting requirements are outlined in Section 7.0 of this plan.

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

4.3 Treatment System Monitoring and Sampling

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 monitoring of such components is not included in this SMP.

4.4 Post-Remediation Media Monitoring and Sampling

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

Table 5 – Post Remediation Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	VOCs (EPA Method 8260C)	SVOCs (EPA Method 8270D)	PCBs (EPA Method 8082A)	
Monitoring Wells 1, 2, 3R, and 4R	X	X	X	Annual

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

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

Table 6 summarizes the wells identification number, as well as the purpose, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, four on-site wells are sampled to monitor for natural attenuation.

Table 6 – Monitoring Well Construction Details

Monitoring Well ID	Well Location	Well Diameter (inches)	Elevation (feet above mean sea level)			
			Casing	Surface	Screen Top	Screen Bottom
MW-1	Northeast corner	2”	390.3923	390.559	384.559	374.559
MW-2	Southeast corner	2”	390.6493	390.816	385.816	375.816
MW-3R	Southwest corner	2”	390.8533	391.02	386.02	376.02
MW-4R	Northwest corner	2”	389.5303	389.697	384.697	374.697

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

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

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

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

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

Deliverables for the groundwater monitoring program are specified in Section 7.

4.4.1 Monitoring and Sampling Protocol

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

SECTION 5

OPERATION AND 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.

SECTION 6

PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

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

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

A flood plain analysis of the site was conducted to evaluate the impact of the site grading after the remedial action on the floodplain boundary and flood elevations in the vicinity of the site (Appendix J). After the results of this analysis were reviewed by the City of Syracuse, it was decided that the final grade of the site could not exceed the pre-remedial action grade.

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).

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

6.2.1 Timing of Green Remediation Evaluations

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

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

6.2.2. Remedial Systems

Remedial systems will be operated properly considering the current site conditions to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates and use of reagents and consumables. Spent materials will be sent for recycling, as appropriate.

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

6.2.4 Metrics and Reporting

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

6.3 Remedial System Optimization

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

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the decision document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;

- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

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

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

SECTION 7

REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix I. These forms are subject to NYSDEC revision.

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

Table 7: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annually
Periodic Review Report	Annually, or as otherwise determined by the Department

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

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

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

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

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

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

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

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

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

7.2 Periodic Review Report

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

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.

- Results of the required annual site inspections and severe condition inspections, if applicable.

- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.

- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.

- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

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

- A site evaluation, which includes the following:

  - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;

  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and

  - Trends in contaminant 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 performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

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

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

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*

- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*

- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*

- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*

- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*

- *Use of the site is compliant with the environmental easement;*

- *The engineering control systems are performing as designed and are effective;*

- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices]; and*

- *The information presented in this report is accurate and complete.*

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

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

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, 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.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.3, upon completion of an RSO, an RSO report must be submitted to the Department for approval. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present

recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

SECTION 8

REFERENCES

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

NYSDEC, 2006. 6 NYCRR Part 375, Environmental Remediation Programs, New York State Department of Environmental Conservation, December 14, 2006.

NYSDEC, 2009. Commissioner Policy CP-43 Groundwater Monitoring Well Decommissioning. August 2009.

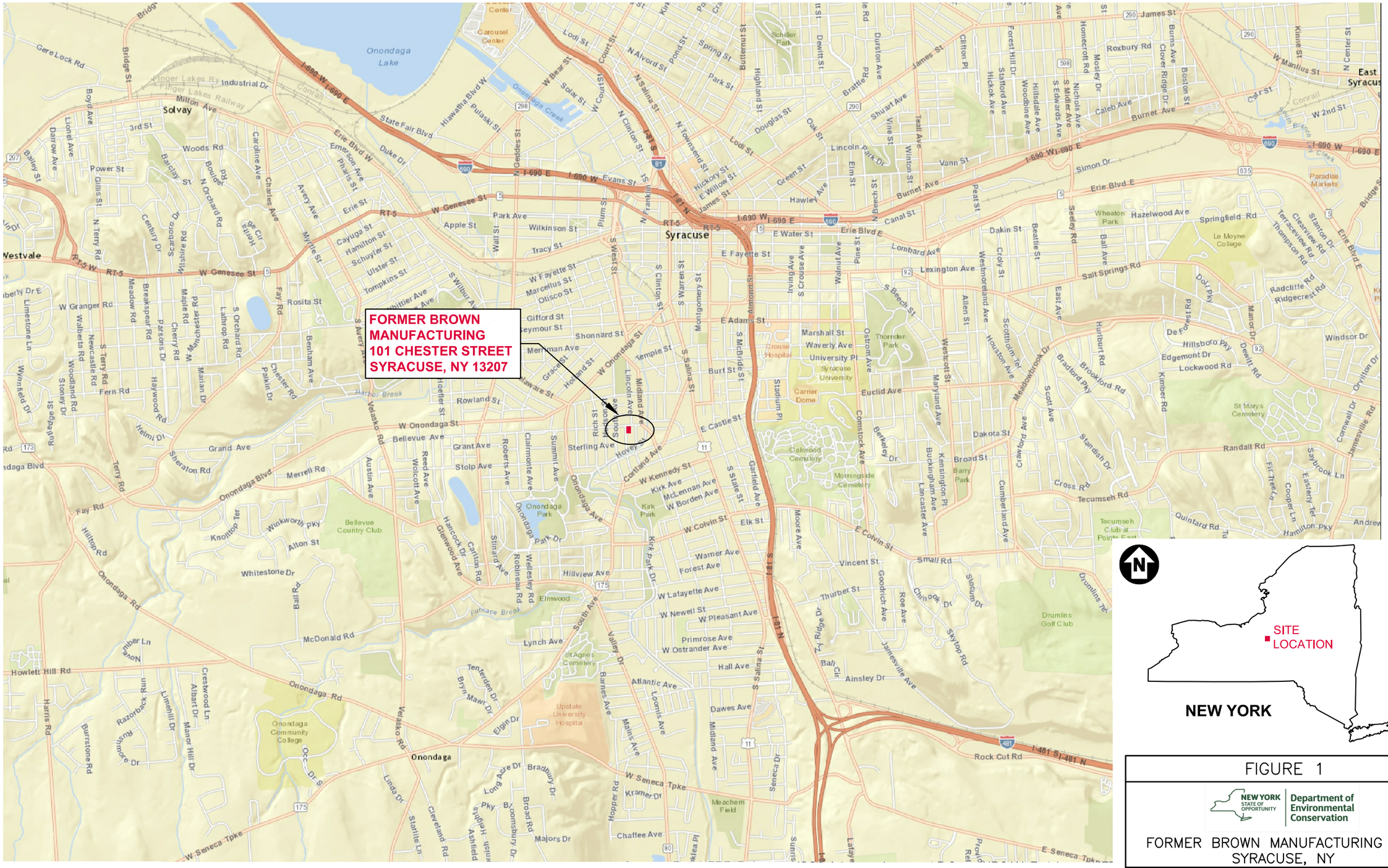
NYSDEC, 2010. DER-10 Technical Guidance for Site Investigation and Remediation, May 3,2010.

NYSDEC, 2011. DER-31 Green Remediation, January 20, 2011.

NYSDEC, 2012. Record of Decision, Former Brown Manufacturing Site. New York State Department of Environmental Conservation. March 2012.

Parsons, 2016. Remedial Action Work Plan, Former Brown Manufacturing Site. Prepared on behalf of NYSDEC.

FIGURES



3000 1500 0 3000 6000

SCALE: 1"=3000'

FIGURE 1

NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

FORMER BROWN MANUFACTURING SITE
SYRACUSE, NY

SITE LOCATION MAP

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 • 315-451-9560

FILE NAME: P:\NYSDEC PROGRAM\449486 – WA #22 – FORMER BROWN MANUFACTURING RD-RA\10.0 TECHNICAL CATEGORIES\CAD\449486-SK001-SITE MAP.DWG
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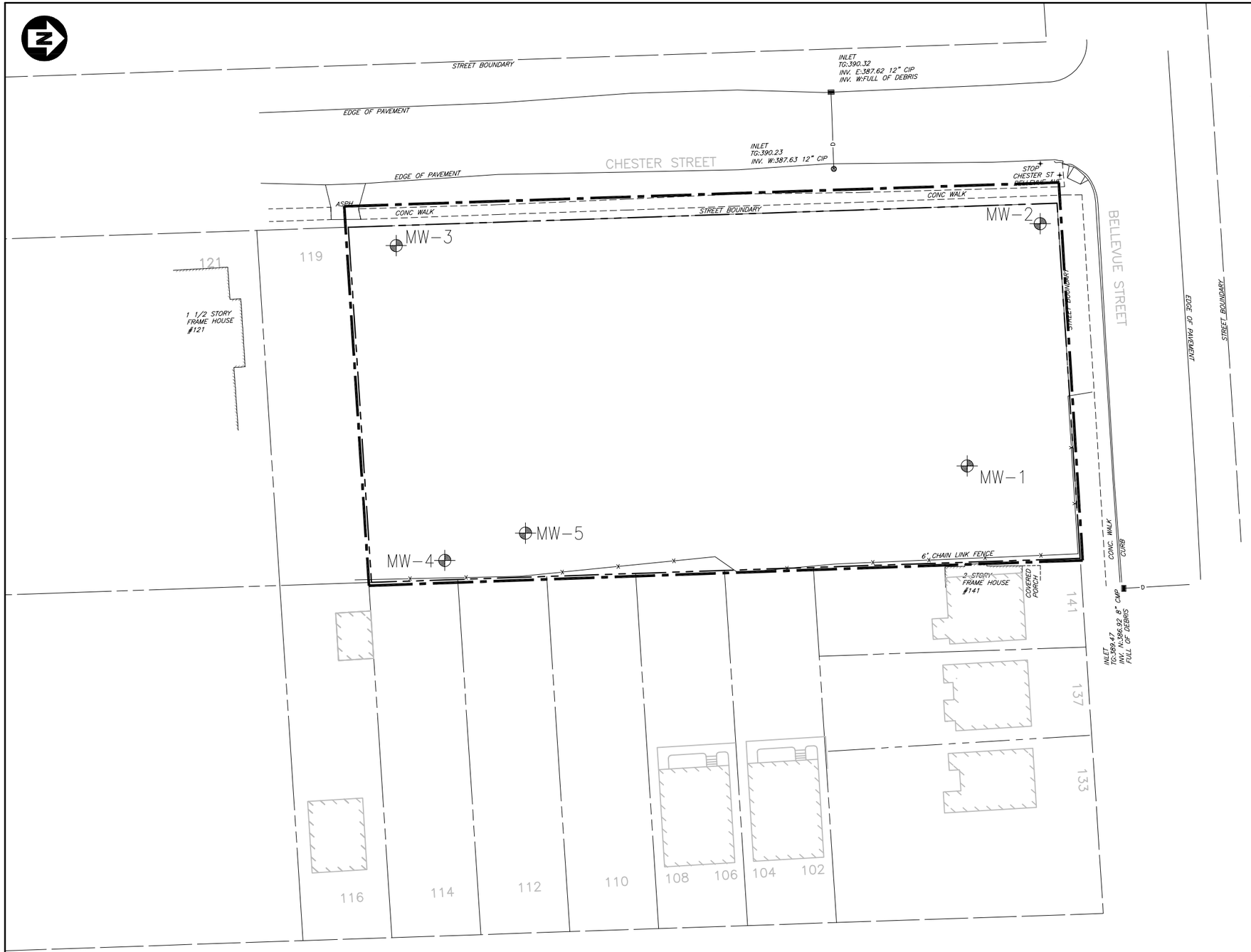

LEGEND:

MW-2 ⊕ MONITORING WELL

PROPERTY LINE

SITE BOUNDARY/INSTITUTIONAL CONTROL BOUNDARY

40 20 0 40 80

SCALE: 1"=40'

FIGURE 2

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

FORMER BROWN MANUFACTURING SITE
SYRACUSE, NY

SITE MAP

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

FILE NAME: P:\NYSDEC PROGRAM\449486 - WA #22 - FORMER BROWN MANUFACTURING RD-RA\10.0 TECHNICAL CATEGORIES\CAD\449486-SURVEY-SK009-SITE MAP.DWG
PLOT DATE: 4/26/2018 11:24 AM PLOTTED BY: GOLDTHWAIT, JAMES

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PREPARED JANUARY 1, 2017

DATE	BLOCK	REVISION

SPECIAL DISTRICT INFORMATION	
SCHOOL	CITY OF SYRACUSE
FIRE	CITY OF SYRACUSE

LEGEND

PROPERTY PARCEL LINE	CITY LINE	PARCEL NUMBER 24	BLOCK NUMBER (2)
ORIGINAL LOT LINE	BLOCK BOUNDARY	DEED AREA (D)	DEED BLOCK NUMBER (J)
ROAD OR RAILROAD RIGHT-OF-WAY LINE	STREET ADDRESS SHOWN WITHIN R.O.W. 126 130	CALCULATED AREA (c)	PROPERTY CONNECTION SYMBOL 7/7
STREAM	STREAM AND PARCEL LINE	DEED DIMENSION (d)	ADJACENT SECTION MAP 25
RAILROAD TRACK		SCALED DIMENSION (s)	
		DEED LOT NUMBER 5	

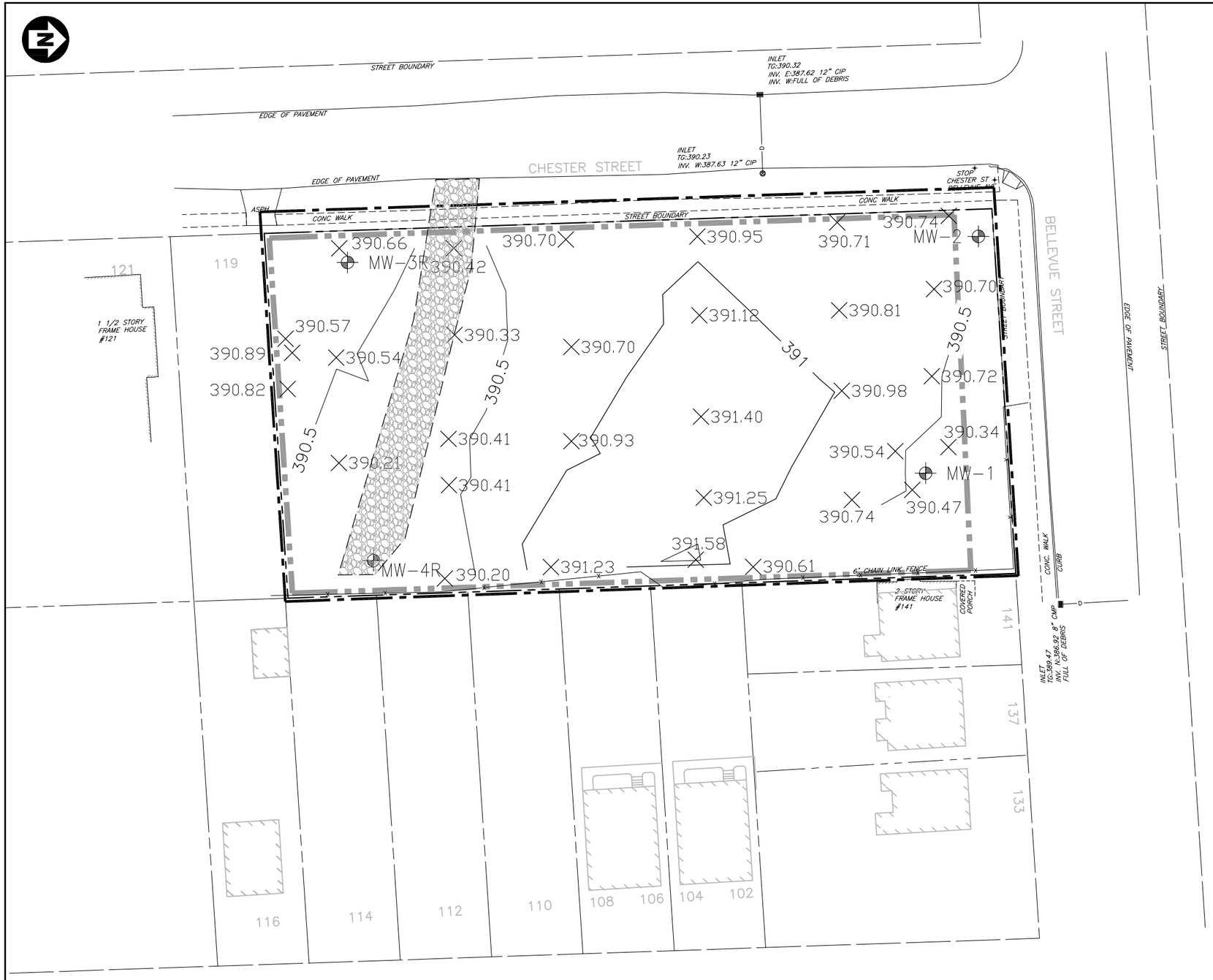
SCALE : 1"= 100'

100' 0 100'

GRAPHIC SCALE

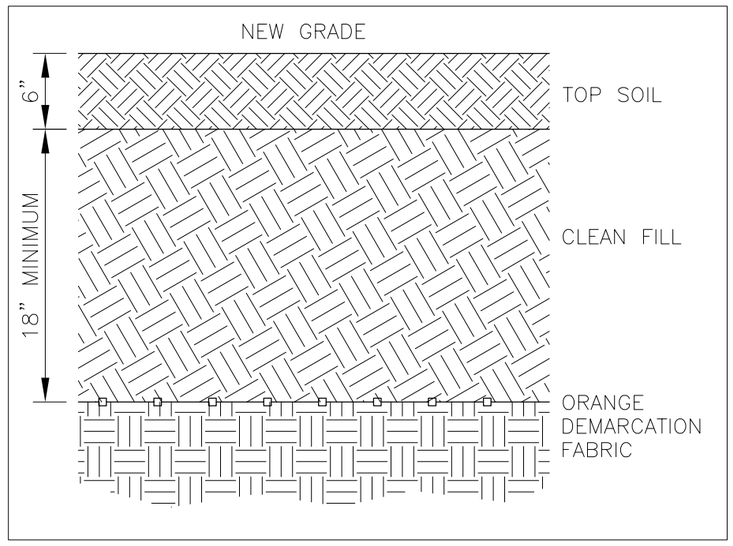
FOR TAXING PURPOSES ONLY
NOT TO BE USED FOR CONVEYANCE

SECTION MAP 86
CITY OF SYRACUSE
ONONDAGA COUNTY, NY



LEGEND:

- MW-2 — MONITORING WELL
- PROPERTY LINE
- 390.71 — FINAL GRADE POINT ELEVATION
- 391 — FINAL GRADE CONTOUR
- COVER SYSTEM BOUNDARY
- SITE COVER IN THIS AREA IS STONE FROM DEMARCATION FABRIC TO 6" BELOW TOPSOIL
- SITE BOUNDARY



RESTORATION DETAIL
NOT TO SCALE

40 20 0 40 80

SCALE: 1"=40'

FIGURE 4

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

FORMER BROWN MANUFACTURING SITE
SYRACUSE, NY

SITE COVER SYSTEM AND RESTORATION

PARSONS
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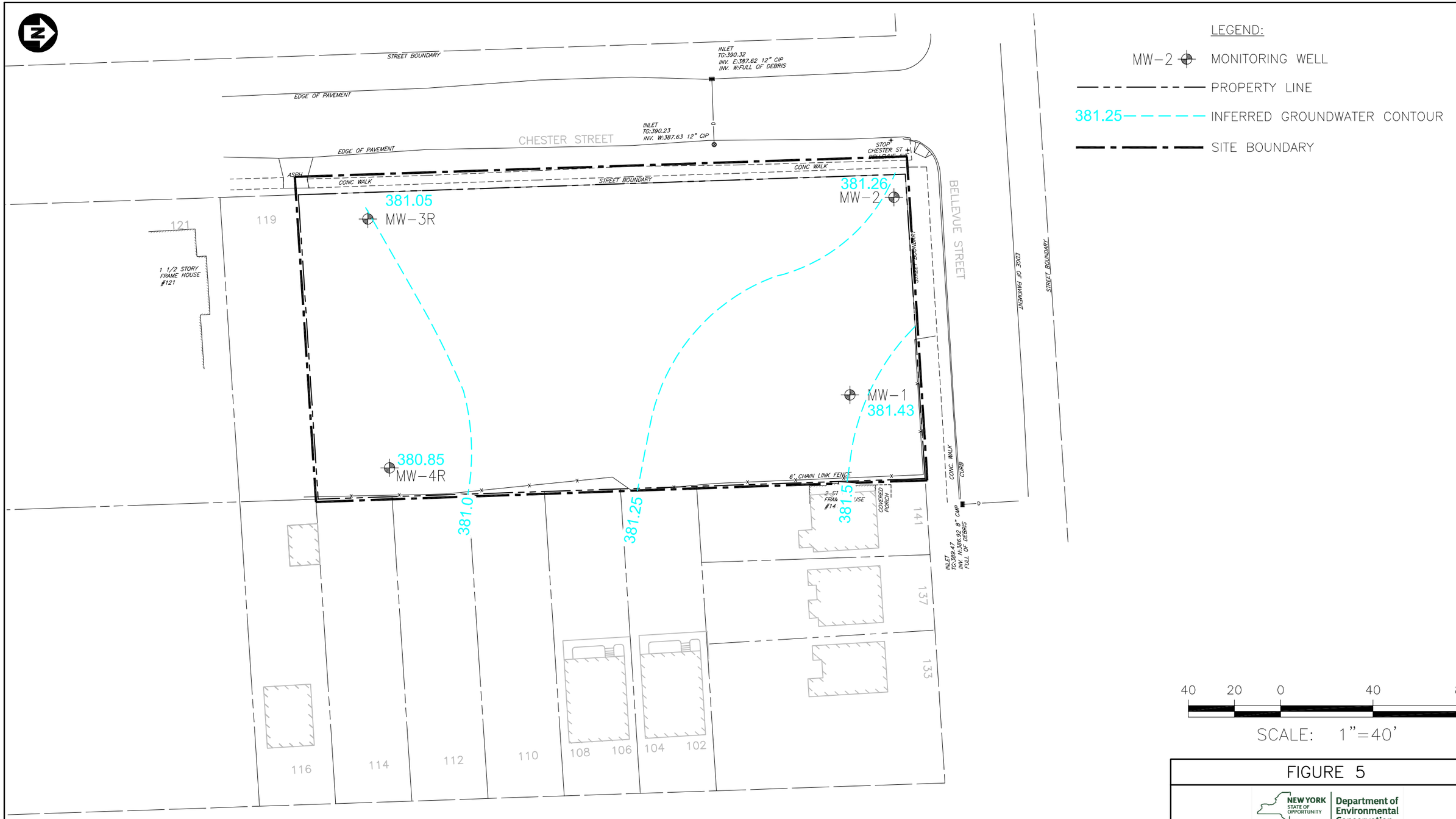

LEGEND:

MW-2 ⊕ MONITORING WELL

PROPERTY LINE

381.25 INFERRED GROUNDWATER CONTOUR

SITE BOUNDARY

40 20 0 40 80

SCALE: 1"=40'

FIGURE 5

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

FORMER BROWN MANUFACTURING SITE
SYRACUSE, NY

GROUNDWATER CONTOUR MAP

PARSONS
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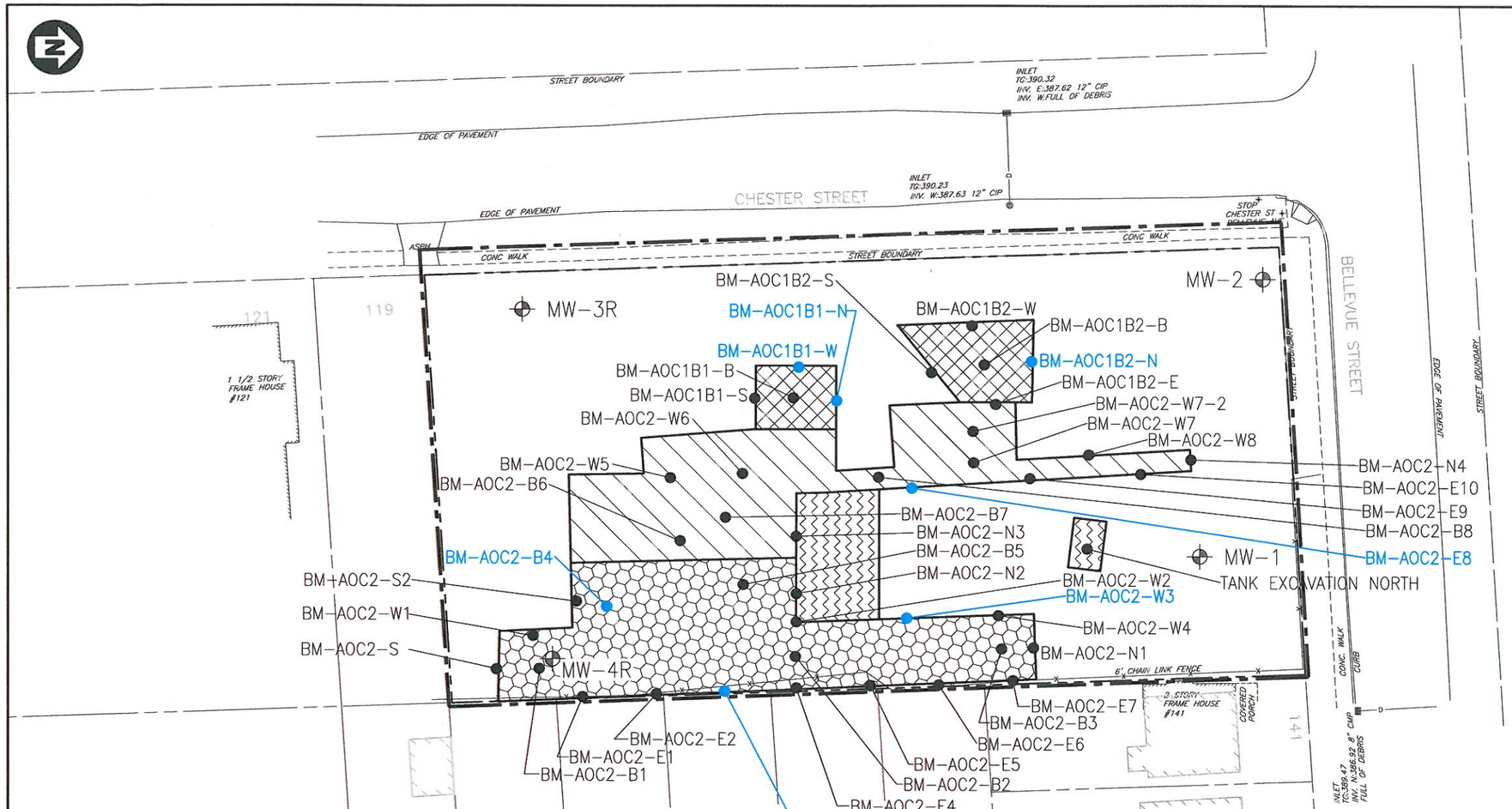

LEGEND:

- MW-2 — MONITORING WELL
- PROPERTY LINE
- BM-AOC2-N1 — POST-EXCAVATION SAMPLE LOCATIONS
- BM-AOC1B1-W — POST-EXCAVATION SAMPLE EXCEEDANCES
- SITE BOUNDARY
- AOC1B PETROLEUM EXCAVATION AREA OFF-SITE DISPOSAL FROM ~0-8 FT
- AOC2 PETROLEUM EXCAVATION AREA OFF-SITE DISPOSAL FROM ~6-15 FT
- UST EXCAVATION AREA OFF-SITE DISPOSAL FROM ~0-15 FT
- AOC2 PETROLEUM EXCAVATION AREA OFF-SITE DISPOSAL FROM ~9-15 FT

NOTES:

ALL SAMPLE RESULTS ARE RECORDED IN mg/kg.

40 20 0 40 80

SCALE: 1"=40'

BM-AOC1B1-W	Restricted Residential SCO	11/28/2016
BENZO(A)ANTHRACENE	1	11
BENZO(A)PYRENE	1	9.1
BENZO(B)FLUORANTHENE	1	11
CHRYSENE	3.9	11
DIBENZ(A,H)ANTHRACENE	0.33	1.5
INDENO(1,2,3-C,D)PYRENE	0.5	6
BARIUM	400	1410
PCB	1	3.23

BM-AOC2-E8	Restricted Residential SCO	11/8/2016
BENZO(A)ANTHRACENE	1	4.3
BENZO(A)PYRENE	1	2.4
BENZO(B)FLUORANTHENE	1	3.1
CHRYSENE	3.9	9.5
INDENO(1,2,3-C,D)PYRENE	0.5	1.7
PCB	1	1.47

BM-AOC1B1-N	Restricted Residential SCO	11/28/2016
PCB	1	1.1

BM-AOC1B2-N	Restricted Residential SCO	12/6/2016
PCB	1	2.2

BM-AOC2-E3	Restricted Residential SCO	11/2/2016
ARSENIC	16	18.8

BM-AOC2-W3	Restricted Residential SCO	11/8/2016
MERCURY	0.81	1.4

BM-AOC2-B4	Restricted Residential SCO	11/11/2016
ARSENIC	16	62.7
COPPER	270	283

FILE NAME: P:\NYSDEC PROGRAM\449486 - WA #22 - FORMER BROWN MANUFACTURING RD-RA\10.0 TECHNICAL CATEGORIES\CAD\449486-SURVEY-SK009-SITE MAP.DWG
PLOT DATE: 4/26/2018 1:36 PM PLOTTED BY: GOLDTHWAIT, JAMES

FIGURE 6

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

FORMER BROWN MANUFACTURING SITE
SYRACUSE, NY

POST EXCAVATION RESTRICTED RESIDENTIAL SOIL SAMPLE EXCEEDANCES

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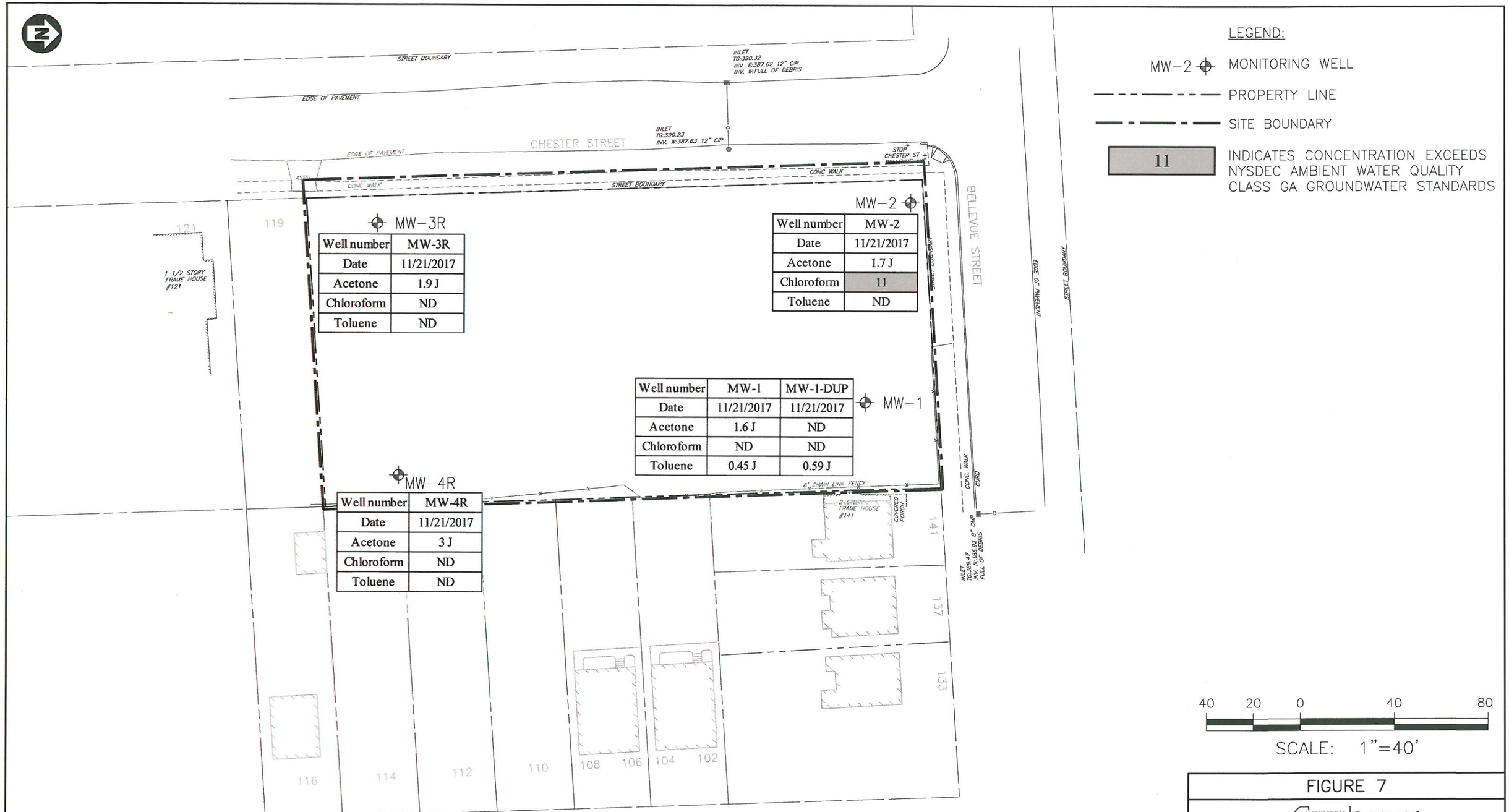

LEGEND:

MW-2 ⊕ MONITORING WELL

PROPERTY LINE

SITE BOUNDARY

11 INDICATES CONCENTRATION EXCEEDS NYSDEC AMBIENT WATER QUALITY CLASS GA GROUNDWATER STANDARDS

40 20 0 40 80

SCALE: 1"=40'

FIGURE 7

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

FORMER BROWN MANUFACTURING SITE
SYRACUSE, NY

GROUNDWATER SAMPLE RESULTS

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PLOT DATE: 4/26/2018 12:08 PM PLOTTED BY: GOLDTHWAIT, JAMES

TABLES

Table 2
Groundwater Gauging Data
Former Brown Manufacturing

Well ID	Dept to Water (ft)	Well Depth (ft)	Dept to Water (ft)	Well Depth (ft)	Dept to Water (ft)	Well Depth (ft)
MW-1	Could not locate		Could not locate		8.45	15.7
MW-2	Unable to open		Unable to open		9.12	15.3
MW-3	11.29	13.95			Destroyed	
MW-3R						
MW-4	13.52	14.28	13.5	13.5	Destroyed	
MW-4R						
MW-5	15.59	15.05	14	15	Destroyed	

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC1A1 BM-AOC1A1-1 R1610962-004 0-6 Inches ALSRNY R1610962 SOIL 10/13/2016 3/30/2017	BM-AOC1A1 BM-AOC1A1-2 R1610962-005 0-6 Inches ALSRNY R1610962 SOIL 10/13/2016 3/30/2017	BM-AOC1A1 BM-AOC1A1-3 R1610962-006 6 inches ALSRNY R1610962 SOIL 10/13/2016 3/30/2017	BM-AOC1A1 BM-AOC1A1-C R1610962-007 6 inches ALSRNY R1610962 SOIL 10/13/2016 3/30/2017	BM-AOC1A2 BM-AOC1A2-1 R1610962-001 0-6 Inches ALSRNY R1610962 SOIL 10/13/2016 3/30/2017	BM-AOC1A2 BM-AOC1A2-2 R1610962-002 0-6 Inches ALSRNY R1610962 SOIL 10/13/2016 3/30/2017
CAS NO.	COMPOUND			UNITS:						
	VOLATILES									
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg						
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg						
67-64-1	ACETONE	0.05	100	mg/kg						
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg						
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg						
104-51-8	N-BUTYLBENZENE	12	100	mg/kg						
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg						
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg						
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg						
	TOTAL VOCS									
	SEMIVOLATILES									
83-32-9	ACENAPHTHENE	20	100	mg/kg						
208-96-8	ACENAPHTHYLENE	100	100	mg/kg						
120-12-7	ANTHRACENE	100	100	mg/kg						
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg						
50-32-8	BENZO(A)PYRENE	1	1	mg/kg						
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg						
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg						
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg						
218-01-9	CHRYSENE	1	3.9	mg/kg						
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg						
132-64-9	DIBENZOFURAN	7	59	mg/kg						
206-44-0	FLUORANTHENE	100	100	mg/kg						
86-73-7	FLUORENE	30	100	mg/kg						
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg						
91-20-3	NAPHTHALENE	12	100	mg/kg						
85-01-8	PHENANTHRENE	100	100	mg/kg						
129-00-0	PYRENE	100	100	mg/kg						
	TOTAL SVOCS									
	PCBs									
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	0.056	ND	ND	0.14	ND	ND
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	0.12	ND	ND	0.034 J	1.9	2.5
11096-82-5	PCB-1260 (AROCLOR 1260)			mg/kg	ND	ND	ND	ND	0.84 J	1.2 J
	TOTAL PCBs	0.1	1	mg/kg	**0.176**	ND	ND	**0.174**	2.74	3.7
	METALS									
7440-38-2	ARSENIC	13	16	mg/kg						
7440-39-3	BARIUM	350	400	mg/kg						
7440-41-7	BERYLLIUM	7.2	72	mg/kg						
7440-43-9	CADMIUM	2.5	4.3	mg/kg						
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg						
7440-50-8	COPPER	50	270	mg/kg						
7439-92-1	LEAD	63	400	mg/kg						
7439-96-5	MANGANESE	1600	2000	mg/kg						
7439-97-6	MERCURY	0.18	0.81	mg/kg						
7440-02-0	NICKEL	30	310	mg/kg						
7782-49-2	SELENIUM	3.9	180	mg/kg						
7440-66-6	ZINC	109	10000	mg/kg						
	OTHER									
TSO-ALSRNY	SOLIDS, PERCENT			percent	88.3	78.7	89.5	83.1	87.5	84.4

Notes:

	Indicates concentration exceeds Restricted Residential SCO
1	Bold values indicate concentration exceeds Unrestricted Use SCO
ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC1A2 BM-AOC1A2-3 R1610962-003 6 inches ALSRNY R1610962 SOIL 10/13/2016 3/30/2017	BM-AOC1B1-B BM-AOC1B1-B R1612539-004 8 ft ALSRNY R1612539 SOIL 11/28/2016 3/30/2017	BM-AOC1B1-N BM-AOC1B1-N R1612539-002 8 ft ALSRNY R1612539 SOIL 11/28/2016 3/30/2017	BM-AOC1B1-S BM-AOC1B1-S R1612539-001 8 ft ALSRNY R1612539 SOIL 11/28/2016 3/30/2017	BM-AOC1B1-W BM-AOC1B1-W R1612539-003 8 ft ALSRNY R1612539 SOIL 11/28/2016 3/30/2017	BM-AOC1B2-B BM-AOC1B2-B R1612784-003 10-15 ft ALSRNY R1612784 SOIL 12/6/2016 3/30/2017
CAS NO.	COMPOUND			UNITS:						
	VOLATILES									
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg		1.7	0.044 J	0.93	0.035 J-	6.2
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg		0.73	0.014 J	0.42	ND	2
67-64-1	ACETONE	0.05	100	mg/kg		0.064 J-	**0.36**	0.087 J-	**0.24**	ND
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg		0.37	ND	0.18 J-	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg		ND	0.11 J-	ND	0.073 J-	ND
104-51-8	N-BUTYLBENZENE	12	100	mg/kg		0.39	R	0.2	ND	2.5
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg		0.21	R	0.21	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg		0.16 J-	R	0.16 J-	ND	ND
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg		ND	R	ND	ND	ND
	TOTAL VOCS					3.624	0.528	2.187	0.348	10.7
	SEMIVOLATILES									
83-32-9	ACENAPHTHENE	20	100	mg/kg		0.12	ND	0.062	1.7	0.27
208-96-8	ACENAPHTHYLENE	100	100	mg/kg		ND	ND	ND	1.1	ND
120-12-7	ANTHRACENE	100	100	mg/kg		ND	ND	ND	4.5	ND
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg		0.32	ND	0.22	11	0.34
50-32-8	BENZO(A)PYRENE	1	1	mg/kg		ND	ND	0.13	9.1	ND
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg		0.12	ND	0.15	11	ND
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg		ND	ND	0.073	5.4	ND
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg		ND	ND	ND	**3.9**	ND
218-01-9	CHRYSENE	1	3.9	mg/kg		1.1	0.68	0.62	11	**1.4**
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg		ND	ND	ND	1.5	ND
132-64-9	DIBENZOFURAN	7	59	mg/kg		0.11	ND	0.063	1.7	0.35
206-44-0	FLUORANTHENE	100	100	mg/kg		0.25	0.33	0.24	18	0.36
86-73-7	FLUORENE	30	100	mg/kg		0.27	ND	0.13	3.2	0.71
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg		ND	ND	0.072	6	ND
91-20-3	NAPHTHALENE	12	100	mg/kg		0.68	ND	0.12	2.2	2.8
85-01-8	PHENANTHRENE	100	100	mg/kg		1.5	0.75	0.67	17	2.3
129-00-0	PYRENE	100	100	mg/kg		0.41	0.49	0.32	20	0.54
	TOTAL SVOCS					4.88	2.25	2.87	128.3	9.07
	PCBs									
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	ND	0.19 J	1.1	0.1 J	2.4 J	ND
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	1.7	0.038	ND	ND	0.83	ND
11096-82-5	PCB-1260 (AROCLOR 1260)			mg/kg	0.62 J	ND	ND	ND	ND	ND
	TOTAL PCBs	0.1	1	mg/kg	2.32	**0.228**	1.1	0.1	3.23	ND
	METALS									
7440-38-2	ARSENIC	13	16	mg/kg		3	4	4.5	6.7	2
7440-39-3	BARIUM	350	400	mg/kg		34.3	94.6	114	1410	38.4
7440-41-7	BERYLLIUM	7.2	72	mg/kg		ND	0.578	0.491	ND	ND
7440-43-9	CADMIUM	2.5	4.3	mg/kg		ND	ND	ND	1.4	ND
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg		9	17.1	14.1	14.3	7.2
7440-50-8	COPPER	50	270	mg/kg		10.3	19.7	25.6	**86.6**	6.9
7439-92-1	LEAD	63	400	mg/kg		7.8	17.5	19	**282**	ND
7439-96-5	MANGANESE	1600	2000	mg/kg		289	471	313	299	148
7439-97-6	MERCURY	0.18	0.81	mg/kg		ND	0.062	0.08	**0.602**	ND
7440-02-0	NICKEL	30	310	mg/kg		8.7	21	21.2	**38.7**	8.6
7782-49-2	SELENIUM	3.9	180	mg/kg		1.3	1.8	1.6	1.9	1.8
7440-66-6	ZINC	109	10000	mg/kg		23.6	59	51.7	**259**	20.8
	OTHER									
TSO-ALSRNY	SOLIDS, PERCENT			percent	83.6	89.5	75.3	78.9	74.4	81.4

Notes:

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ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC1B2-E BM-AOC1B2-E R1612784-004 10-15 ft ALSRNY R1612784 SOIL 12/6/2016 3/30/2017	BM-AOC1B2-N BM-AOC1B2-N R1612784-002 10-15 ft ALSRNY R1612784 SOIL 12/6/2016 3/30/2017	BM-AOC1B2-S BM-AOC1B2-S R1612784-001 10-15 ft ALSRNY R1612784 SOIL 12/6/2016 3/30/2017	BM-AOC1B2-W BM-AOC1B2-W R1612784-005 10-15 ft ALSRNY R1612784 SOIL 12/6/2016 3/30/2017
CAS NO.	COMPOUND			UNITS:				
	VOLATILES							
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg	0.08 J-	1.6	0.68	0.86
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg	ND	1.9	0.22	0.30
67-64-1	ACETONE	0.05	100	mg/kg	**0.37**	0.067 J-	**0.22**	**0.082 J-**
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg	ND	**0.31**	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg	0.095 J-	ND	0.064 J-	ND
104-51-8	N-BUTYLBENZENE	12	100	mg/kg	ND	3.3	0.18 J-	0.25
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg	ND	1.1	0.067 J-	0.16 J-
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg	ND	0.82	0.05 J-	0.11 J-
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg	ND	0.11 J-	ND	ND
	TOTAL VOCS				0.545	9.207	1.481	1.762
	SEMIVOLATILES							
83-32-9	ACENAPHTHENE	20	100	mg/kg	ND	0.65	ND	ND
208-96-8	ACENAPHTHYLENE	100	100	mg/kg	ND	ND	ND	ND
120-12-7	ANTHRACENE	100	100	mg/kg	ND	0.33	ND	ND
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg	0.28	0.55	0.53	0.28
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	ND	ND	ND
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg	ND	0.28	0.18	0.22
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg	ND	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg	ND	ND	ND	ND
218-01-9	CHRYSENE	1	3.9	mg/kg	0.66	**1.6**	**2.1**	**1.1**
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	59	mg/kg	ND	0.58	ND	ND
206-44-0	FLUORANTHENE	100	100	mg/kg	0.26	0.74	ND	0.3
86-73-7	FLUORENE	30	100	mg/kg	ND	1.1	0.26	0.25
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg	ND	ND	ND	ND
91-20-3	NAPHTHALENE	12	100	mg/kg	0.15	4.3	0.57	0.82
85-01-8	PHENANTHRENE	100	100	mg/kg	0.53	3.3	1.8	ND
129-00-0	PYRENE	100	100	mg/kg	0.39	0.97	0.49	0.4
	TOTAL SVOCS				2.27	14.4	5.93	3.37
	PCBs							
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	0.094	2.2	ND	ND
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	ND	ND	ND	ND
11096-82-5	PCB-1260 (AROCLOR 1260)			mg/kg	ND	ND	ND	ND
	TOTAL PCBs	0.1	1	mg/kg	0.094	2.2	ND	ND
	METALS							
7440-38-2	ARSENIC	13	16	mg/kg	4.6	3	4.4	3.6
7440-39-3	BARIUM	350	400	mg/kg	137	77.3	74.8	70.9
7440-41-7	BERYLLIUM	7.2	72	mg/kg	0.673	0.371	ND	ND
7440-43-9	CADMIUM	2.5	4.3	mg/kg	ND	ND	ND	ND
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg	20.7	11.8	12.3	7.9
7440-50-8	COPPER	50	270	mg/kg	29.1	20	13.9	10.9
7439-92-1	LEAD	63	400	mg/kg	18.7	21.6	ND	ND
7439-96-5	MANGANESE	1600	2000	mg/kg	203	226	211	130
7439-97-6	MERCURY	0.18	0.81	mg/kg	0.082	0.095	ND	ND
7440-02-0	NICKEL	30	310	mg/kg	29.5	16.7	16.4	10.1
7782-49-2	SELENIUM	3.9	180	mg/kg	2.9	2.1	2.9	1.9
7440-66-6	ZINC	109	10000	mg/kg	84.7	60.3	41.8	27.9
	OTHER							
TSO-ALSRNY	SOLIDS, PERCENT			percent	66.2	80.1	62.4	76.6

Notes:

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ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC2-B1 BM-AOC2-B1 R1611564-003/2187263001 10-15 ft ALSRNY/ALSMP R1611564/2187263 SOIL 10/31/2016 3/29/2017	BM-AOC2-B2 BM-AOC2-B2 R1611782-002 10-15 ft ALSRNY R1611782 SOIL 11/4/2016 3/30/2017	BM-AOC2-B3 BM-AOC2-B3 R1612614-001 15 ft ALSRNY R1612614 SOIL 12/1/2016 3/30/2017	BM-AOC2-B4 BM-AOC2-B4 R1612051-001 10-15 ft ALSRNY R1612051 SOIL 11/11/2016 3/30/2017	BM-AOC2-B5 BM-AOC2-B5 R1612163-001 15 ft ALS R1612163 SOIL 11/15/2016 3/30/2017	BM-AOC2-B6 BM-AOC2-B6 R1612297-002 15 ft ALSRNY R1612297 SOIL 11/18/2016 3/30/2017	BM-AOC2-B7 BM-AOC2-B7 R1612297-004 16 ft ALSRNY R1612297 SOIL 11/18/2016 3/30/2017	BM-AOC2-B8 BM-AOC2-B8 R1612968-001 10-15 ft ALSRNY R1612968 SOIL 12/7/2016 3/30/2017
CAS NO.	COMPOUND			UNITS:								
	VOLATILES											
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg	ND	0.12 J	0.12 J	ND	0.0354 J-	ND	0.58 J-	3.1
107-06-2	1,2-DICHLOROETHANE	0.02	3.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg	ND	0.034 J	0.04 J	ND	0.005 J-	ND	0.53 J-	0.96
67-64-1	ACETONE	0.05	100	mg/kg	0.014 J-	0.019 J-	0.036 J-	0.021 J-	**0.14 J-**	0.015 J-	ND	ND
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg	ND	ND	0.036 J	ND	0.0076 J-	ND	ND	ND
100-41-4	ETHYLBENZENE	1	41	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg	ND	ND	0.012 J-	ND	ND	ND	ND	ND
75-09-2	METHYLENE CHLORIDE	0.05	100	mg/kg	ND	ND	ND	ND	0.0333 J-	ND	ND	ND
104-51-8	N-BUTYLBENZENE	12	100	mg/kg	ND	0.04 J	0.038 J	ND	ND	ND	0.81 J-	1
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg	ND	0.012 J	0.018 J	ND	0.0124 J-	ND	0.64 J-	ND
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg	ND	0.023 J	0.013 J	ND	0.0137 J-	ND	0.46 J-	ND
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg	ND	R	R	ND	ND	ND	0.06 J-	ND
1634-04-4	TERT-BUTYL METHYL ETHER	0.93	100	mg/kg	ND	ND	ND	ND	0.0012 J	ND	ND	ND
127-18-4	TETRACHLOROETHYLENE(PCE)	1.3	19	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
108-88-3	TOLUENE	0.7	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
	TOTAL VOCS				0.014	0.248	0.313	0.021	0.2486	0.015	3.08	5.06
	SEMIVOLATILES											
83-32-9	ACENAPHTHENE	20	100	mg/kg	ND	ND	ND	ND	0.047	0.0091	0.46	0.31
120-12-7	ANTHRACENE	100	100	mg/kg	ND	ND	ND	ND	ND	ND	0.21	ND
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg	0.019	0.17	0.36	ND	0.063	ND	0.43	0.57
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	0.018	ND	ND	ND	ND	ND	ND	ND
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg	0.021	ND	0.18	ND	ND	ND	ND	ND
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg	0.014	ND	ND	ND	ND	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
218-01-9	CHRYSENE	1	3.9	mg/kg	0.035	0.92	1.5	ND	0.29	0.0081	**1.9**	**3**
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	59	mg/kg	ND	ND	ND	ND	0.048	ND	0.36	0.36
206-44-0	FLUORANTHENE	100	100	mg/kg	0.027	ND	0.38	ND	0.075	ND	ND	ND
86-73-7	FLUORENE	30	100	mg/kg	ND	ND	0.19	ND	0.1	ND	0.75	0.77
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg	0.015	ND	ND	ND	ND	ND	ND	ND
91-20-3	NAPHTHALENE	12	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	2.1
85-01-8	PHENANTHRENE	100	100	mg/kg	0.016	0.82	1.2	ND	0.12	0.0095	2.7	3.9
129-00-0	PYRENE	100	100	mg/kg	0.03	0.22	0.58	ND	0.11	ND	0.68	1.1
	TOTAL SVOCS				0.195	2.13	4.39	0	0.853	0.0267	7.49	12.11
	PCBs											
53469-21-9	PCB-1242 (AROCLOR 1242)			mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	ND	ND	ND	ND	ND	ND	0.15	0.79
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
	TOTAL PCBs	0.1	1	mg/kg	ND	ND	ND	ND	ND	ND	**0.15**	**0.79**
	METALS											
7440-38-2	ARSENIC	13	16	mg/kg	ND	3.6	3.8	62.7 J	5.6	5.4	ND	2.8
7440-39-3	BARIUM	350	400	mg/kg	56	44	92.3 J	110 J	24	87.4	12.8	30.3
7440-41-7	BERYLLIUM	7.2	72	mg/kg	ND	ND	ND	0.472	ND	ND	ND	ND
7440-43-9	CADMIUM	2.5	4.3	mg/kg	ND	ND	ND	1.2	ND	ND	ND	ND
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg	9.3	5.7	8	13.7	5.1	5.5	4.6	6.7
7440-50-8	COPPER	50	270	mg/kg	9.3	9.2	11.7	283	11.5	12.7	9.1	9
7439-92-1	LEAD	63	400	mg/kg	6.8	ND	11.3	11.4	7	ND	ND	ND
7439-96-5	MANGANESE	1600	2000	mg/kg	191	200	218 J	147	211	198	135	179
7439-97-6	MERCURY	0.18	0.81	mg/kg	ND	ND	ND	0.05	ND	ND	ND	ND
7440-02-0	NICKEL	30	310	mg/kg	12.8	10.2	15.6	**35.5 J**	11.4	8.2	6.5	9.4
7782-49-2	SELENIUM	3.9	180	mg/kg	ND	ND	2	**9.6 J**	2.3	2.1	1.4	1.4
7440-66-6	ZINC	109	10000	mg/kg	29	20.2	30.7	74.5	24.8	22.1	16.2	22.3
	OTHER											
MOIST	MOISTURE, PERCENT			%	23				16.6			
TSO-ALSMT	SOLIDS, PERCENT			%	77				83.4			
TSO-ALSRNY	SOLIDS, PERCENT			percent	76.7	82.6	75.3	76.5	76.1	84.2	86.2	82.2

Notes:

	Indicates concentration exceeds Restricted Residential SCO
1	Bold values indicate concentration exceeds Unrestricted Use SCO
ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC2-E1 BM-AOC2-E1 R1611614-001/2187262001 10-15 ft ALSRNY/ALSMP R1611614/2187262 SOIL 11/1/2016 3/30/2017	BM-AOC2-E2 BMAOC2-E2 R1611614-002/2187262002 10-15 ft ALSRNY/ALSMP R1611614/2187262 SOIL 11/1/2016 3/30/2017	BM-AOC2-E3 BM-AOC2-E3 R1611695-001/2187261001 10-15 ft ALSRNY/ALSMP R1611695/2187261 SOIL 11/2/2016 3/30/2017	BM-AOC2-E4 BM-AOC2-E4 R1611782-001 10-15 ft ALSRNY R1611782 SOIL 11/4/2016 3/30/2017	BM-AOC2-E5 BM-AOC2-E5 R1611850-001 10-15 ft ALSRNY R1611850 SOIL 11/7/2016 3/30/2017	BM-AOC2-E6 BM-AOC2-E6 R1611850-002 10-15 ft ALSRNY R1611850 SOIL 11/8/2016 3/30/2017	BM-AOC2-E7 BM-AOC2-E7 R1612614-002 15 ft ALSRNY R1612614 SOIL 11/30/2016 3/30/2017	BM-AOC2-E8 BM-AOC2-E8 R1612968-002 10-15 ft ALSRNY R1612968 SOIL 12/7/2016 3/30/2017	BM-AOC2-E9 BM-AOC2-E9 R1612968-005 10-15 ft ALSRNY R1612968 SOIL 12/8/2016 3/30/2017
CAS NO.	COMPOUND			UNITS:									
	VOLATILES												
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg	R	0.0086 J	0.018 J	0.011 J	0.78 J	0.37 J+	0.14 J	**4.9**	1.4
107-06-2	1,2-DICHLOROETHANE	0.02	3.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg	0.023 J	0.027 J	0.0067 J	R	0.21 J	0.12 J	0.043 J	1.5	0.05 J-
67-64-1	ACETONE	0.05	100	mg/kg	0.03 J-	0.055 J-	0.015 J-	0.14 J-	0.0097 J-	0.018 J-	**0.064 J-**	ND	**0.069 J-**
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg	ND	ND	ND	ND	ND	0.071 J-	0.032 J-	ND	0.12 J-
100-41-4	ETHYLBENZENE	1	41	mg/kg	ND	ND	ND	ND	0.0059 J-	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg	0.0065 J-	0.016 J-	ND	ND	ND	ND	0.018 J-	ND	ND
75-09-2	METHYLENE CHLORIDE	0.05	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
104-51-8	N-BUTYLBENZENE	12	100	mg/kg	0.049 J	0.025 J	0.045 J	0.023 J	0.11 J	0.07 J	0.03 J	1.6	0.31
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg	0.019 J	0.015 J	R	0.016 J	0.087 J	0.048 J	0.023 J	ND	0.2
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg	0.029 J	0.01 J	0.027 J	0.0098 J	0.057 J	0.033 J	0.014 J	ND	0.16 J-
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg	R	R	R	R	R	R	R	ND	ND
1634-04-4	TERT-BUTYL METHYL ETHER	0.93	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
127-18-4	TETRACHLOROETHYLENE(PCE)	1.3	19	mg/kg	0.019 J-	ND	0.15 J-	0.024 J-	0.006 J-	ND	ND	ND	ND
108-88-3	TOLUENE	0.7	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
	TOTAL VOCS				0.1755	0.1566	0.2617	0.2238	1.2656	0.73	0.364	8	2.309
	SEMIVOLATILES												
83-32-9	ACENAPHTHENE	20	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	1	0.28
120-12-7	ANTHRACENE	100	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	2.1	ND
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg	ND	0.19	0.33	0.37	0.23	0.14	0.46	4.3	0.58
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	ND	ND	ND	ND	ND	0.18	2.4	ND
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg	ND	ND	ND	ND	ND	ND	0.14	3.1	ND
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	1.7	ND
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg	ND	ND	ND	ND	ND	ND	ND	**0.95**	ND
218-01-9	CHRYSENE	1	3.9	mg/kg	**2.4**	**2.2**	**1.7**	**1.6**	**1.3**	0.94	**2.6**	9.5	**1.9**
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	59	mg/kg	ND	ND	ND	ND	ND	ND	ND	1.8	0.25
206-44-0	FLUORANTHENE	100	100	mg/kg	ND	ND	ND	ND	ND	ND	0.29	5.7	0.39
86-73-7	FLUORENE	30	100	mg/kg	ND	0.21	0.21	0.17	0.27	0.19	0.25	2.6	0.53
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	1.7	ND
91-20-3	NAPHTHALENE	12	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	4.6	0.91
85-01-8	PHENANTHRENE	100	100	mg/kg	ND	ND	0.61	0.19	2	1.4	2.5	15	2.2
129-00-0	PYRENE	100	100	mg/kg	0.52	0.45	0.38	0.38	0.37	0.23	0.6	7.8	0.67
	TOTAL SVOCS				2.92	3.05	3.23	2.71	4.17	2.9	7.02	64.25	7.71
	PCBs												
53469-21-9	PCB-1242 (AROCLOR 1242)			mg/kg	ND	ND	ND	ND	0.91	0.37	ND	ND	ND
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	ND	ND	ND	ND	ND	ND	ND	1.2	ND
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	ND	ND	ND	ND	ND	ND	ND	0.27	ND
	TOTAL PCBs	0.1	1	mg/kg	ND	ND	ND	ND	**0.91**	**0.37**	ND	1.47	ND
	METALS												
7440-38-2	ARSENIC	13	16	mg/kg	ND	ND	18.8	2.1	3.4	ND	2.2	8	3.2
7440-39-3	BARIUM	350	400	mg/kg	52.9	55.5 J	39.9	47.9	91.4	24.7 J	69.1	167	71.3
7440-41-7	BERYLLIUM	7.2	72	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
7440-43-9	CADMIUM	2.5	4.3	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg	7.2	9 J	15.9	6.9	7.8	5	7.6	9	13.6
7440-50-8	COPPER	50	270	mg/kg	10.5	15.3 J	16.1	10.3	17	10.8	9.3	**57.3**	10.1
7439-92-1	LEAD	63	400	mg/kg	7.5	6.1 J	ND	15.6	40	ND	ND	**127**	ND
7439-96-5	MANGANESE	1600	2000	mg/kg	220	280 J	390	171	354	147	188	118	144
7439-97-6	MERCURY	0.18	0.81	mg/kg	ND	ND	ND	ND	**0.228**	ND	ND	**0.214**	ND
7440-02-0	NICKEL	30	310	mg/kg	10.9	14.4 J	21.7	10.4	12.4	9.5	11.2	12.5	13.5
7782-49-2	SELENIUM	3.9	180	mg/kg	ND	ND	ND	1.9	1.9	1.8	1.8	2.4	1.7
7440-66-6	ZINC	109	10000	mg/kg	26.9	32 J	35.8	32.5	47.8	17.5	25	92.9	26.8
	OTHER												
MOIST	MOISTURE, PERCENT			%	26.8	51	17						
TSO-ALSMT	SOLIDS, PERCENT			%	73.2	49	83						
TSO-ALSRNY	SOLIDS, PERCENT			percent	80.7	71.4	82.8	84.8	86.9	80.3	76.1	68	80.3

Notes:

	Indicates concentration exceeds Restricted Residential SCO
1	Bold values indicate concentration exceeds Unrestricted Use SCO
ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC2-E10 BM-AOC2-E10 R1612968-007 10-15 ft ALSRNY R1612968 SOIL 12/8/2016 3/30/2017	BM-AOC2-N1 BM-AOC2-N1 R1612614-003 15 ft ALSRNY R1612614 SOIL 11/30/2016 3/30/2017	BM-AOC2-N2 BM-AOC2-N2 R1612163-002 15 ft ALS R1612163 SOIL 11/15/2016 3/30/2017	BM-AOC2-N3 BM-AOC2-N3 R1612297-003 15 ft ALSRNY R1612297 SOIL 11/18/2016 3/30/2017	BM-AOC2-N4 BM-AOC2-N4 R1612968-008 10-15 ft ALSRNY R1612968 SOIL 12/8/2016 3/30/2017	BM-AOC2-S BM-AOC2-S R1611564-004/2187263002 10-15 ft ALSRNY/ALSMP R1611564/2187263 SOIL 10/31/2016 3/29/2017	BM-AOC2-S2 BM-AOC2-S2 R1612051-002 10-15 ft ALSRNY R1612051 SOIL 11/11/2016 3/30/2017	BM-AOC2-S2 BM-AOC2-S2-DUP R1612051-003 10-15 ft ALSRNY R1612051 SOIL 11/11/2016 3/30/2017	BM-AOC2-W1 BM-AOC2-W1 R1611564-005/2187263003 10-15 ft ALSRNY/ALSMP R1611564/2187263 SOIL 10/31/2016 3/29/2017
CAS NO.	COMPOUND			UNITS:										
	VOLATILES													
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg	ND	0.036 J	R	0.087 J-	ND	ND	ND	ND	ND	
107-06-2	1,2-DICHLOROETHANE	0.02	3.1	mg/kg	ND	ND	0.0018 J	ND	ND	ND	ND	ND	ND	
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg	ND	R	R	0.22 J-	ND	ND	ND	ND	ND	
67-64-1	ACETONE	0.05	100	mg/kg	**0.065 J-**	0.018 J-	**0.0725 J-**	ND	0.019 J-	0.023 J-	ND	ND	0.016 J-	
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg	ND	ND	0.0076 J	ND	ND	ND	ND	ND	ND	
100-41-4	ETHYLBENZENE	1	41	mg/kg	ND	ND	0.0013 J	ND	ND	ND	ND	ND	ND	
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg	0.017 J-	ND	ND	ND	ND	ND	ND	ND	ND	
75-09-2	METHYLENE CHLORIDE	0.05	100	mg/kg	ND	ND	0.032 J	ND	ND	ND	ND	ND	ND	
104-51-8	N-BUTYLBENZENE	12	100	mg/kg	ND	0.039 J	0.0401 J	0.2 J-	ND	ND	ND	ND	ND	
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg	ND	0.025 J	0.0583 J	0.12 J-	ND	ND	ND	ND	ND	
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg	ND	0.023 J	0.0439 J	0.069 J-	ND	ND	ND	ND	ND	
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg	ND	R	R	ND	ND	ND	ND	ND	ND	
1634-04-4	TERT-BUTYL METHYL ETHER	0.93	100	mg/kg	ND	ND	0.00088 J	ND	ND	ND	ND	ND	ND	
127-18-4	TETRACHLOROETHYLENE(PCE)	1.3	19	mg/kg	ND	ND	0.0159 J-	ND	ND	ND	ND	ND	ND	
108-88-3	TOLUENE	0.7	100	mg/kg	ND	ND	0.0054 J-	ND	ND	ND	ND	ND	ND	
	TOTAL VOCS				0.082	0.141	0.27968	0.696	0.019	0.023	0	0	0.016	
	SEMIVOLATILES													
83-32-9	ACENAPHTHENE	20	100	mg/kg	ND	ND	0.2	ND	ND	ND	ND	ND	ND	
120-12-7	ANTHRACENE	100	100	mg/kg	ND	ND	ND	ND	0.044	ND	ND	ND	ND	
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg	ND	0.72	0.28	ND	0.15	0.011	ND	ND	ND	
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	ND	ND	ND	0.15	ND	ND	ND	ND	
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg	ND	ND	ND	ND	0.18	0.011	ND	ND	ND	
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg	ND	ND	ND	ND	0.11	ND	ND	ND	ND	
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg	ND	ND	ND	ND	0.068	ND	ND	ND	ND	
218-01-9	CHRYSENE	1	3.9	mg/kg	0.076	**3.6**	**1.7**	0.77	0.14	0.02	0.1	0.12	0.016	
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	
132-64-9	DIBENZOFURAN	7	59	mg/kg	ND	ND	0.17	ND	ND	ND	ND	ND	ND	
206-44-0	FLUORANTHENE	100	100	mg/kg	ND	ND	ND	ND	0.29	0.015	ND	ND	0.011	
86-73-7	FLUORENE	30	100	mg/kg	ND	0.36	0.46	0.16	ND	ND	ND	ND	ND	
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg	ND	ND	ND	ND	0.11	ND	ND	ND	ND	
91-20-3	NAPHTHALENE	12	100	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	
85-01-8	PHENANTHRENE	100	100	mg/kg	ND	2.8	0.24	1.1	0.14	0.011	ND	ND	ND	
129-00-0	PYRENE	100	100	mg/kg	ND	0.84	0.41	0.19	0.26	0.016	ND	ND	0.012	
	TOTAL SVOCS				0.076	8.32	3.46	2.22	1.642	0.084	0.1	0.12	0.039	
	PCBs													
53469-21-9	PCB-1242 (AROCLOR 1242)			mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	ND	ND	0.054	ND	ND	ND	ND	ND	ND	
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	TOTAL PCBs	0.1	1	mg/kg	ND	ND	0.054	ND	ND	ND	ND	ND	ND	
	METALS													
7440-38-2	ARSENIC	13	16	mg/kg	3.1	2.7	2.3	7.7	1.8	ND	2.9	2.8	ND	
7440-39-3	BARIUM	350	400	mg/kg	110	55.2	38.5	37.9	46	41.6	25.3	31.4	104	
7440-41-7	BERYLLIUM	7.2	72	mg/kg	0.501	ND	ND	ND	ND	ND	ND	ND	ND	
7440-43-9	CADMIUM	2.5	4.3	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg	14.9	6.8	3.8	6	7.1	6.7	5.1	5.6	23.4	
7440-50-8	COPPER	50	270	mg/kg	16.7	10	5.5	7.2	13.7	15.8	10.9	11.1	16.3	
7439-92-1	LEAD	63	400	mg/kg	9.9	ND	ND	ND	13.9	10	7.5 J	21 J	12.1	
7439-96-5	MANGANESE	1600	2000	mg/kg	268	166	211	205	166	278	210	194	509	
7439-97-6	MERCURY	0.18	0.81	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.037 J	ND	
7440-02-0	NICKEL	30	310	mg/kg	20.5	12.1	6.2	7.3	9	11.1	7.4	8.6	**30.7**	
7782-49-2	SELENIUM	3.9	180	mg/kg	2	1.8	1.5	1.7	1.6	ND	1.9	2.1	ND	
7440-66-6	ZINC	109	10000	mg/kg	49.4	26.1	18	17.5	31.1	24.5	19.3	20.2	54.7	
	OTHER													
MOIST	MOISTURE, PERCENT			%			19.2			19.5			20.4	
TSO-ALSMT	SOLIDS, PERCENT			%			80.8			80.5			79.6	
TSO-ALSRNY	SOLIDS, PERCENT			percent	73.6	72.3	79.8	91	77.3	70.8	88.2	83	72.5	

Notes:

	Indicates concentration exceeds Restricted Residential SCO
1	Bold values indicate concentration exceeds Unrestricted Use SCO
ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC2-W2 BM-AOC2-W2 R1611782-003 10-15 ft ALSRNY R1611782 SOIL 11/4/2016 3/30/2017	BM-AOC2-W2 BM-AOC2-W2-DUP R1611782-004 10-15 ft ALSRNY R1611782 SOIL 11/4/2016 3/30/2017	BM-AOC2-W3 BM-AOC2-W3 R1611850-003 10-15 ft ALSRNY R1611850 SOIL 11/8/2016 3/30/2017	BM-AOC2-W3 BM-AOC2-W3-DUP R1611850-004 10-15 ft ALSRNY R1611850 SOIL 11/8/2016 3/30/2017	BM-AOC2-W4 BM-AOC2-W4 R1612614-004 15 ft ALSRNY R1612614 SOIL 11/30/2016 3/30/2017	BM-AOC2-W5 BM-AOC2-W5 R1612297-001 16 ft ALSRNY R1612297 SOIL 11/18/2016 3/30/2017	BM-AOC2-W6 BM-AOC2-W6 R1612297-005 16 ft ALSRNY R1612297 SOIL 11/18/2016 3/30/2017	BM-AOC2-W7 BM-AOC2-W7 R1612968-003 10-15 ft ALSRNY R1612968 SOIL 12/8/2016 3/30/2017
CAS NO.	COMPOUND			UNITS:								
	VOLATILES											
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg	0.055 J	0.15 J	0.025 J	0.024 J	0.019 J	ND	1.1 J-	2.8
107-06-2	1,2-DICHLOROETHANE	0.02	3.1	mg/kg	ND	ND	ND	ND	R	ND	ND	ND
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg	0.024 J	0.058 J	0.017 J	0.024 J	0.0092 J	ND	0.46 J-	0.37
67-64-1	ACETONE	0.05	100	mg/kg	ND	0.03 J	0.17 J-	0.17 J-	**0.096 J**	ND	ND	**0.13 J-**
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg	ND	ND	ND	ND	R	ND	0.21 J-	**0.34**
100-41-4	ETHYLBENZENE	1	41	mg/kg	ND	ND	ND	ND	R	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg	ND	ND	0.0088 J-	0.012 J-	0.025 J	ND	ND	ND
75-09-2	METHYLENE CHLORIDE	0.05	100	mg/kg	ND	ND	ND	ND	R	ND	ND	ND
104-51-8	N-BUTYLBENZENE	12	100	mg/kg	0.028 J	0.05 J	0.018 J	0.024 J	0.0097 J	0.6 J-	0.34 J-	0.66
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg	0.014 J	0.029 J	0.0097 J	0.012 J	R	0.28 J-	0.17 J-	0.31
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg	0.012 J	0.021 J	0.0081 J	0.011 J	R	0.33 J-	0.11 J-	0.3
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg	R	R	R	R	R	0.046 J-	ND	0.035 J-
1634-04-4	TERT-BUTYL METHYL ETHER	0.93	100	mg/kg	ND	ND	ND	ND	R	ND	ND	ND
127-18-4	TETRACHLOROETHYLENE(PCE)	1.3	19	mg/kg	ND	ND	0.032 J	0.016 J	R	ND	ND	ND
108-88-3	TOLUENE	0.7	100	mg/kg	ND	ND	ND	ND	R	ND	ND	ND
	TOTAL VOCS				0.133	0.338	0.2886	0.293	0.1589	1.256	2.39	4.945
	SEMIVOLATILES											
83-32-9	ACENAPHTHENE	20	100	mg/kg	ND	ND	0.11	0.082	ND	1	0.17	0.37
120-12-7	ANTHRACENE	100	100	mg/kg	ND	ND	0.19 J	0.092 J	ND	0.41	ND	0.37
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg	0.19	0.24	0.23	0.17	0.17	0.31	0.28	0.91
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	ND	0.16	0.092	ND	ND	ND	ND
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg	ND	ND	0.19	0.11	ND	0.12	ND	0.32
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg	ND	ND	0.15 J	ND	ND	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
218-01-9	CHRYSENE	1	3.9	mg/kg	**1.1**	1	**1.1**	0.73	**1.1**	**1.2**	**1.2**	**2.3**
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	59	mg/kg	ND	ND	ND	ND	ND	0.73	0.16	0.46
206-44-0	FLUORANTHENE	100	100	mg/kg	ND	ND	0.21	0.17	0.19	0.37	ND	0.83
86-73-7	FLUORENE	30	100	mg/kg	ND	ND	0.28	0.22	ND	1.6	0.33	0.89
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg	ND	ND	0.13 J	ND	ND	ND	ND	ND
91-20-3	NAPHTHALENE	12	100	mg/kg	ND	ND	ND	ND	ND	ND	0.47	1.8
85-01-8	PHENANTHRENE	100	100	mg/kg	1.1	1.1	0.55	0.41	0.41	1.8	1.7	3
129-00-0	PYRENE	100	100	mg/kg	0.27	0.33	0.39	0.3	0.29	0.78	0.48	1.4
	TOTAL SVOCS				2.66	2.67	3.69	2.376	2.16	8.32	4.79	12.65
	PCBs											
53469-21-9	PCB-1242 (AROCLOR 1242)			mg/kg	ND	ND	0.72 J	0.36 J	ND	ND	ND	ND
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	0.34 J	0.14 J	ND	ND	ND	0.095	0.62	ND
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
	TOTAL PCBs	0.1	1	mg/kg	**0.34**	**0.14**	**0.72**	**0.36**	ND	0.095	**0.62**	ND
	METALS											
7440-38-2	ARSENIC	13	16	mg/kg	5.4	6	1.8	2.1	2.3	3	2.9	2.8
7440-39-3	BARIUM	350	400	mg/kg	76.4 J	32.7 J	80.6	89.4	63.1	39.2	53.8	100
7440-41-7	BERYLLIUM	7.2	72	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
7440-43-9	CADMIUM	2.5	4.3	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg	8.2	7	8	8.3	7.3	6.6	8.4	7.7
7440-50-8	COPPER	50	270	mg/kg	13.8 J	**60.7 J**	14.4	12.3	11.1	7.5	10.1	10.6
7439-92-1	LEAD	63	400	mg/kg	9	10.8	16 J	8.6 J	ND	ND	6.7	16.1
7439-96-5	MANGANESE	1600	2000	mg/kg	183	221	194	167	150	230	163	233
7439-97-6	MERCURY	0.18	0.81	mg/kg	ND	ND	ND	1.4	ND	ND	ND	ND
7440-02-0	NICKEL	30	310	mg/kg	13	19.7	12.5	13.5	11.9	8.1	11	9.8
7782-49-2	SELENIUM	3.9	180	mg/kg	2.6	2	1.5	1.6	2.3	1.8	1.9	ND
7440-66-6	ZINC	109	10000	mg/kg	29	40.1	29.7	27.9	24.9	21.4	27.9	27.9
	OTHER											
MOIST	MOISTURE, PERCENT			%								
TSO-ALSMT	SOLIDS, PERCENT			%								
TSO-ALSRNY	SOLIDS, PERCENT			percent	77.2	76.4	84.9	81.6	75.7	70.9	86.4	70.8

Notes:

	Indicates concentration exceeds Restricted Residential SCO
1	Bold values indicate concentration exceeds Unrestricted Use SCO
ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 3 - Soil Sampling Data
Post Excavation Samples
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use SCOs	6 NYCRR Part 375 Restricted Residential SCOs	Location ID: Sample ID: Lab Sample Id Depth: Source: SDG: Matrix: Sampled: Validated:	BM-AOC2-W7 BM-AOC2-W7-2 R1612968-004 10-15 ft ALSRNY R1612968 SO 12/8/2016 3/30/2017	BM-AOC2-W8 BM-AOC2-W8 R1612968-006 10-15 ft ALSRNY R1612968 SOIL 12/8/2016 3/30/2017	TANK EXCAVATION-NORTH TANK EXCAVATION-NORTH R1613522-001 ALSRNY R1613522 SOIL 12/28/2016 3/29/2017
CAS NO.	COMPOUND			UNITS:			
	VOLATILES						
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	52	mg/kg	5.9	0.063 J-	ND
107-06-2	1,2-DICHLOROETHANE	0.02	3.1	mg/kg	ND	ND	ND
108-67-8	1,3,5-TRIMETHYLBENZENE	8.4	52	mg/kg	0.83	ND	ND
67-64-1	ACETONE	0.05	100	mg/kg	**0.15**	**0.081 J-**	ND
1330-20-7	XYLENES, TOTAL	0.26	100	mg/kg	**0.59**	ND	ND
100-41-4	ETHYLBENZENE	1	41	mg/kg	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	0.12	100	mg/kg	0.042	ND	ND
75-09-2	METHYLENE CHLORIDE	0.05	100	mg/kg	ND	ND	ND
104-51-8	N-BUTYLBENZENE	12	100	mg/kg	0.56	ND	ND
103-65-1	N-PROPYLBENZENE	3.9	100	mg/kg	0.3	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	100	mg/kg	0.2	ND	ND
98-06-6	T-BUTYLBENZENE	5.9	100	mg/kg	ND	ND	ND
1634-04-4	TERT-BUTYL METHYL ETHER	0.93	100	mg/kg	ND	ND	ND
127-18-4	TETRACHLOROETHYLENE(PCE)	1.3	19	mg/kg	ND	ND	ND
108-88-3	TOLUENE	0.7	100	mg/kg	ND	ND	ND
	TOTAL VOCS				8.572	0.144	ND
	SEMIVOLATILES						
83-32-9	ACENAPHTHENE	20	100	mg/kg	0.46	0.087	0.34
120-12-7	ANTHRACENE	100	100	mg/kg	0.31	0.18	0.1
56-55-3	BENZO(A)ANTHRACENE	1	1	mg/kg	0.9	0.52	ND
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	0.43	ND
205-99-2	BENZO(B)FLUORANTHENE	1	1	mg/kg	0.26	0.51	ND
191-24-2	BENZO(G,H,I)PERYLENE	100	100	mg/kg	ND	0.3	ND
207-08-9	BENZO(K)FLUORANTHENE	0.8	3.9	mg/kg	ND	0.17	ND
218-01-9	CHRYSENE	1	3.9	mg/kg	**2.5**	0.79	0.17
53-70-3	DIBENZ(A,H)ANTHRACENE	0.33	0.33	mg/kg	ND	0.085	ND
132-64-9	DIBENZOFURAN	7	59	mg/kg	0.6	0.1	0.22
206-44-0	FLUORANTHENE	100	100	mg/kg	0.62	0.82	0.043
86-73-7	FLUORENE	30	100	mg/kg	1.1	0.21	0.44
193-39-5	INDENO(1,2,3-C,D)PYRENE	0.5	0.5	mg/kg	ND	0.31	ND
91-20-3	NAPHTHALENE	12	100	mg/kg	3.9	0.23	0.38
85-01-8	PHENANTHRENE	100	100	mg/kg	3.7	0.87	1
129-00-0	PYRENE	100	100	mg/kg	1.2	0.81	0.11
	TOTAL SVOCS				15.55	6.422	2.803
	PCBs						
53469-21-9	PCB-1242 (AROCLOR 1242)			mg/kg	ND	ND	
12672-29-6	PCB-1248 (AROCLOR 1248)			mg/kg	ND	ND	
11097-69-1	PCB-1254 (AROCLOR 1254)			mg/kg	0.3	0.1	
	TOTAL PCBs	0.1	1	mg/kg	**0.3**	0.1	
	METALS						
7440-38-2	ARSENIC	13	16	mg/kg	2.8	3	
7440-39-3	BARIUM	350	400	mg/kg	106	70.1	
7440-41-7	BERYLLIUM	7.2	72	mg/kg	ND	ND	
7440-43-9	CADMIUM	2.5	4.3	mg/kg	ND	ND	
7440-47-3	CHROMIUM, TOTAL	30	180	mg/kg	8.2	9.2	
7440-50-8	COPPER	50	270	mg/kg	13.5	12.6	
7439-92-1	LEAD	63	400	mg/kg	21.9	13.3	
7439-96-5	MANGANESE	1600	2000	mg/kg	206	166	
7439-97-6	MERCURY	0.18	0.81	mg/kg	ND	ND	
7440-02-0	NICKEL	30	310	mg/kg	10.7	12	
7782-49-2	SELENIUM	3.9	180	mg/kg	2	2.1	
7440-66-6	ZINC	109	10000	mg/kg	37.1	35.2	
	OTHER						
MOIST	MOISTURE, PERCENT			%			
TSO-ALSMT	SOLIDS, PERCENT			%			
TSO-ALSRNY	SOLIDS, PERCENT			percent	77.8	75.3	86.3

Notes:

	Indicates concentration exceeds Restricted Residential SCO
1	Bold values indicate concentration exceeds Unrestricted Use SCO
ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

Table 4
Groundwater Analytical Results
Former Brown Manufacturing

NYSDEC-Former Brown Manufacturing 2017 Site Investigation Preliminary GroundwaterAnalytical Data SDG: 480-127906-1		NYSDEC Ambient Water Quality Class GA Groundwater Standards	Location ID: Sample ID: Lab Sample Id Depth: Source: SDG: Matrix: Sampled: Validated:	MW-1 MW-1-20171121 480-127906-3 - TALBUFF 4801279061 WATER 11/21/2017	MW-1-DUP MW-1-DUP-20171121 480-127906-5 - TALBUFF 4801279061 WATER 11/21/2017	MW-2 MW-2-20171121 480-127906-4 - TALBUFF 4801279061 WATER 11/21/2017	MW-3R MW-3R-20171121 480-127906-1 - TALBUFF 4801279061 WATER 11/21/2017	MW-4R MW-4R-20171121 480-127906-2 - TALBUFF 4801279061 WATER 11/21/2017	FIELDQC TRIP BLANK-20171121 480-127906-6 - TALED 4801279061 WQ 11/21/2017
CAS NO.	COMPOUND		UNITS:						
	VOLATILES								
67-64-1	Acetone	50	ug/l	1.6 J	ND	1.7 J	1.9 J	3 J	ND
67-66-3	Chloroform	7	ug/l	ND	ND	11	ND	ND	ND
108-88-3	Toluene	NS	ug/l	1.6 JN	0.59 J	ND	ND	ND	ND
	SEMIVOLATILES								
	None Detected								
	PCBs								
	None Detected								

Notes:

	Indicates concentration exceeds standard or guidance value.
ND	Non-detect
NS	No standard or guidance value available.
J	Indicates an estimated concentration.
N	Indicates presumptive evidence of the concentration.
ug/l	Micrograms per liter
mg/l	Milligrams per liter

APPENDIX A

ENVIRONMENTAL EASEMENT

Memorandum

To: City of Syracuse Departments of Neighborhood & Business Development, Law, Finance, Assessment & Zoning

From: Owen Kerney, Assistant Director, City Planning

Re: Environmental Easement: 101 Chester Street, Syracuse, NY

Date: July 28, 2017

As requested by the New York State Department of Environmental Conservation, I am advising you that the attached Environmental Easement for the City-owned property at **101 Chester Street** was recorded in the Office of the Onondaga County Clerk on June 28, 2017. Please keep a copy of this for your records.

Please review it and contact me at (315) 448-8110 or okerney@syrgov.net if you have any questions.

Thank you.

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

THIS INDENTURE made this 25th day of May, 2017, between Owner(s) City of Syracuse, having an office at 203 City Hall, 233 E. Washington Street, Syracuse, New York 13202, County of Onondaga, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

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

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

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

WHEREAS, Grantor, is the owner of real property located at the address of 101 Chester Street in the City of Syracuse, County of Onondaga and State of New York, known and designated on the tax map of the County Clerk of Onondaga as tax map parcel numbers: Section 86 Block 7 Lot 31, being the same as that property conveyed to Grantor by deed dated August 17, 1994 and recorded in the Onondaga County Clerk's Office in Liber and Page 3946/128. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.797 +/- acres, and is hereinafter more fully described in the Land Title Survey dated October 23, 2015 and last revised February 6, 2017 prepared by Scott V. Smith, LLS of Fisher Associates, P.E., L.S., L.A., D.P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is

extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of NYWII ERP Agreement Index Number: NYWII-B00024-12-14, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

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

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

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

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

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

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

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

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

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

(7) All future activities on the property that will disturb remaining

contaminated material must be conducted in accordance with the SMP;

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

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

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

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

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

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

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

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

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

Law.

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

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

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

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

(i) are in-place;

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

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

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

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

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

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

(7) the information presented is accurate and complete.

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

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

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

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against

the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

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

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

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

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

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

Parties shall address correspondence to:

Site Number: B00024
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

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

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

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the

recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

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

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

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

Remainder of Page Intentionally Left Blank

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

City of Syracuse:

By: _____

Print Name: Stephanie A. Miner

Title: Mayor Date: 5-3-17

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 3rd day of May, in the year 20 17 before me, the undersigned, personally appeared Stephanie A. Miner 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

JOSEPH W. BARRY III
Notary Public in the State of New York
Qualified in Onondaga County
No. 02BA5051526
My Commission Expires 11/6/17

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

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

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

On the 25th day of May, in the year 2017, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

SCHEDULE "A" PROPERTY DESCRIPTION

All that tract or parcel of land containing 0.797 acres, more or less, situate in the 12th Ward of the City of Syracuse, Onondaga County, State of New York, being more particularly bounded and described as follows:

Beginning at a point in the southerly street boundary of Bellevue Avenue (60' wide) at its intersection with the easterly street boundary of Chester Street (60' wide); thence

1) North 86°16'04" East along the said southerly street boundary of Bellevue Avenue, a distance of 132.00 feet to a point in the division line between the lands of the City of Syracuse on the west and the lands now or formerly of TKTD, Inc. on the east; thence

2) South 01°56'36" East along said division line and extending, a distance of 263.00 feet to a point on the division line between the lands of the City of Syracuse on the north and the lands now or formerly of Howard Davis Enterprises, Inc. on the south; thence

3) South 86°16'04" West along said division, a distance of 132.00 feet to appoint in the said easterly street boundary of Chester Street; thence

4) North 01°56'36" West along the said easterly street boundary of Chester Street, a distance of 263.00 feet to the point of beginning.

Subject to any easements or encumbrances of record.

APPENDIX B

LIST OF SITE CONTACTS

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Title	Name	Phone/Email Address
Site Owner	City of Syracuse, Mayor, Authorized Representative	
Remedial Party	City of Syracuse, Owen Kerney Assistant Director, City Planning Division Syracuse – Onondaga County Planning Agency	201 East Washington Street, Room 512 Syracuse, New York 13202 P: 315.448.8110
Qualified Environmental Professional - Parsons	Thomas Drachenberg, P.E.	(315) 552-9688 thomas.drachenberg@parsons.com
NYSDEC Project Manager	Joshua Cook, P.E.	(315) 426-7411 joshua.cook@dec.ny.gov
NYSDEC Regional HW Engineer	Harry Warner	(315) 426-7551 harry.warner@dec.ny.gov
NYSDEC Site Control	Kelly Lewandowski	(518) 402-9553 kelly.lewandowski@dec.ny.gov

APPENDIX C

BORING LOGS

Contractor:	Zebra		**BORING/** Page 1 of 1
Driller:	Joe Hutchins/ Ronnell Royall		**WELL NO. SB-01**
Oversight:	Sara Weishaupt	**PROJECT NAME:** Former Brown Manufacturing Site	**Location Description:**
Rig Type:	Geoprobe (Track Mount)	**PROJECT Locatio** Syracuse, NY	AOC 1A/1B

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	10	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 0935
Date/Time Finish: 10/ 08 /15 @ 0946

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil/ Grass	0	(0-1'): Topsoil/grass	
					1	(1-2.17'): Concrete and fine Gravel. (Fill)	
MC	-	4 / 5	0	Fill	2	(2.17-3'): Dry, loose, brown, fine SAND, little silt, some fine sub angular gravel, little organics, little debris.	
					3	(3-3.5'): Dry, soft, brown, SILT, some fine gravel, little fine sand.	
					4	(3.5-5'): Dry, loose, grey/white, ash/fire remnants/debris.	
				ML	5		
					6	Moist, stiff, grey/brown mottled, SILT, some clay, plastic, trace fine sand.	
MC	-	5 / 5	0		7		
					8		
					9		
					10	End of Boring @ 10 ft. bgs	
					11		
					12		
					13		
					14	Samples Collected: * 1-1.5' @ 940	
					15	2-2.5' @ 941	
					16	3-3.5' @ 942	
					17	4-4.5' @ 943 5-5.5' @ 944 6-6.5' @ 945 [MS/MSD]	
					18	7.5-8' @ 946	
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
No odors, no sheens
* Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-02
Location Description: AOC 1A/1B

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	10	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 0905
Date/Time Finish: 10/ 08 /15 @ 0925

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1.5'): Topsoil/grass (1.5-2.67'): Dry, soft, brown, SILT and fine Gravel, trace fine sand, trace medium sand, trace organics.	
					1		
MC	-	4 / 5	0.3	Fill	2	(2.67-3.33'): Red Brick	
					3	(3.33-4.5'): Dry, loose, grey/white, fine angular GRAVEL, some silt, some fine sand, trace organics.	
					4	(4.5-5'): Dry, stiff, black, SILT, trace fine sand, petroleum odor.	
				MH			
				Wood	5	(5-5.5'): Wood fragments	
				Fill	6	(5.5-6.5'): Dry, loose, grey, gravel/concrete	
MC	-	2 / 5	0.3		7	(6.5-7'): Moist, soft, dark grey, SILT and Clay, some fine sub angular gravel, petroleum odor.	
				ML	8	(7-10'): Moist, medium stiff, grey/brown mottled, SILT and Clay, plastic, petroleum odor.	
					9		
					10	End of Boring @ 10 ft. bgs	
					11		
					12		
					13		
					14	Samples Collected: 1-1.5' @ 920 2-2.5' @ 921 3-3.5' @ No Sample collected (Construction/fire debris) 4-4.5' @ 922 5-5.5' @ No Sample collected (Brick) * 6-6.5' @ 923 7.5-8' @ 0924 [Duplicate collected SB-102 @ 1200]	
					15		
					16		
					17		
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odor present; No sheens
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-03
Location Description:
AOC 1A/1B

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	10	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 1010
Date/Time Finish: 10/ 08 /15 @ 1035

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-2.58'): Dry, loose, brown, Silt/Gravel/fine to medium Sand	
MC	-	4 / 5	0.7		2	(2.58-4.5'): Concrete/debris, brick and wood fragments.	
					3	(4.5-4.67'): Dry, loose, black, fine SAND, trace silt, chemical odor.	
					4	(4.67-5'): Dry, stiff, grey/brown mottled, SILT and Clay.	
				ML	5	(5-5.5'): Dry, still, grey/brown mottled, SILT and Clay.	
				Marl	6	(5.5-7.58'): Moist, loose, grey, fine SAND, some silt, trace medium sand, little fine sub angular gravel, NAPL, chemical odor.	
MC	-	4 / 5	0.3		7	(7.58-10'): Moist, medium stiff, grey/brown, SILT and Clay, very faint chemical odor.	
				ML	8		
					9		
					10	End of Boring @ 10 ft. bgs	
					11		
					12		
					13		
					14	Samples Collected: 1-1.5' @ 1030 2-2.5' @ No Sample collected (construction/fill debris) 3-3.5' @ No Sample collected (wood/brick fragments) 4-4.5' @ 1031 5-5.5' @ 1032 6-6.5' @ 1033 * 7.5-8' @ 1034	
					15		
					16		
					17		
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
NAPL from (5.5-7.58'); chemical odors
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-04
Location Description:
AOC 1A/1B

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	10	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 1116
Date/Time Finish: 10/ 08 /15 @ 1141

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
					1	(1-2.5'): Dry, soft, brown, SILT, trace fine sand, trace fine gravel, some organics.	
MC	-	4.5 / 5	1.3	Fill	2	(2.5-2.83'): Brick/wood fragments	
					3	(2.83-4.17'): Dry, loose, dark grey, fine to medium SAND, little silt, trace brick/ gravel fragments. Wood from (3.83-4.17').	
					4	(4.17-5'): Dry, loose, grey, fine SAND, little silt, little fine angular gravel, slight chemical odor.	
				Marl	5	(5-7.5'): Dry, loose, grey, fine SAND, little silt, little fine angular gravel, slight chemical odor.	
					6		
MC	-	4.5 / 5	0.3		7	(7.5-10'): Moist, stiff, grey/brown, SILT and Clay, trace organics, very faint chemical odor.	
				ML	8		
					9		
					10	End of Boring @ 10 ft. bgs	
					11		
					12		
					13		
					14	Samples Collected: 1-1.5' @ 1135	
					15	2-2.5' @ 1136	
					16	3-3.5' @ 1137 4-4.5' @ 1138	
					17	5-5.5' @ 1139 * 6-6.5' @ 1140	
					18	7.5-8' @ 1141	
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Chemical odors
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-05
Location Description:
AOC 1A/1B

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	10	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 1040
Date/Time Finish: 10/ 08 /15 @ 1102

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-2.5'): Dry, soft, brown, SILT, little fine sand, trace fine angular gravel, trace organics.	
MC	-	4 / 5	0.1		2	(2.5-3.5'): Dry, hard, brown, SILT, trace fine angular gravel, trace fine sand.	
					3	(3.5-4'): Wood fragments.	
					4	(4-5'): Moist, loose, grey, fine to medium SAND, little fine sub angular gravel, chemical odor (fill).	
					5	(5-6'): Moist, loose, grey, fine to medium SAND, little fine sub angular gravel, chemical odor (fill).	
					6	(6-6.33'): Wet, soft, brown SILT and fine Sand, trace fine gravel, chemical odor.	
MC	-	4.5 / 5	0.1	ML	7		
					8	(6.33-10'): Moist, stiff, grey/brown mottled, SILT and Clay, trace organics, chemical odor to 9'.	
					9		
					10	End of Boring @ 10 ft. bgs	
					11		
					12		
					13		
					14	Samples Collected: 1-1.5' @ 1055	
					15	2-2.5' @ 1056	
					16	3-3.5' @ 1057	
					17	4-4.5' @ 1058 5-5.5' @ 1059 * 6-6.5' @ 1100 7.5-8' @ 1001	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Chemical odors from (4.0 - 9.0')
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-06
Location Description:
AOC 1A/1B

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	10	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 0945
Date/Time Finish: 10/ 09 /15 @ 1010

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-4'): Dry, soft, brown, SILT, little fine sand, trace fine angular gravel.	
MC	-	3 / 5	0.3		2	(4-4.5'): Brick	
					3	(4.5-5'): Moist, soft, brown, SILT, little clay, little fine sand, trace organics, chemical odor.	
					4		
				ML	5	(5-9.5'): Moist, soft, grey/brown mottled, SILT, little clay, little fine sand, trace medium sand, petroleum odor.	
					6	(9.5-10'): Concrete/rock/gravel.	
MC	-	3 / 5	0.3		7		
					8		
					9		
				Rock/Gravel	10	End of Boring @ 10 ft. bgs	
					11		
					12		
					13		
					14	Samples Collected: 1-1.5' @ 1005	
					15	2-2.5' @ 1006	
					16	3-3.5' @ 1007 4-4.5' @ No Sample collected (Brick)	
					17	5-5.5' @ 1008 * 6-6.5' @ 1009	
					18	7.5-8' @ 1010	
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odor from (5.0 - 9.5')
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-07
Location Description:
AOC 1A/1B

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	7	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 0845
Date/Time Finish: 10/ 08 /15 @ 0900

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-3'): Dry, soft, brown, SILT, trace fine angular gravel, some organics.	
MC	-	3 / 5	0		2	(3-3.5'): Brick	
					3	(3.5-5'): Dry, loose, fine Sand/Brick/Gravel (fill)	
					4		
					5	(5-7'): Dry, loose, fine Sand/Brick/Gravel (fill)	
MC	-	1 / 2	0		6		
					7	End of Boring @ 7ft. Bgs (REFUSAL)	
					8		
					9		
					10		
					11		
					12		
					13		
					14	Samples Collected: * 1-1.5' @ 850	
					15	2-2.5' @ 852	
					16	3-3.5' @ No Sample Collected (Brick) 4-4.5' @ 854	
					17	5-5.5' @ 855 6-6.5' @ 856	
					18	7.5-8' @ No Sample Collected (EOB @ 7' bgs)	
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
No odors or sheens
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-08
Location Description:
Haz Waste Determination

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 1355
Date/Time Finish: 10/ 08 /15 @ 1430

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-3'): Dry, soft, brown, SILT, some fine to medium sand, little fine angular gravel (fill).	
MC	-	4 / 5	0.1		2	(3-3.5'): Concrete	
					3	(3.5-3.75'): Wood with strong MGP-like odor and green color liquid.	
					4	(3.75-5'): Brick/Gravel/Concrete (fill)	
				SM	5	(5-6.6'): Moist, loose, dark grey, fine to medium SAND, some silt, travel fine angular gravel.	
					6	(6.5'-10'): Moist, stiff, grey/brown mottled, SILT and Clay, trace organics, very slight chemical odor.	
MC	-	4 / 5	0.1	ML	7		
					8		
					9		
					10	(10-12'): Moist, stiff, grey/brown mottled, SILT and Clay, trace organics, very slight chemical odor.	
					11	(12-14.5'): Wet, loose, grey, fine-medium-coarse SAND, little silt, trace fine fine rounded gravel, chemical odor.	
MC	-	3 / 5	0.2	Marl	12		
					13	(14.5-15'): Wood fragments, chemical odor.	
				Wood	14		
				Marl	15	(15-16'): Wet, loose, grey, fine-medium-coarse SAND, little silt, trace fine Wet, loose, grey, fine to medium SAND, little silt, rainbow sheen, slight	
				ML	16	(16-20'): Wet, loose, brown, fine Sand, little silt, 2-inch thick clay seam at 17.25' and 18.67', no odors or sheens.	
MC	-	4 / 5	0.2		17		
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: * 3.5-4' @ 1430 [PCBs and/or SVOCs if possible - wood fragment] * 10-12' @ 1430 [TCLP Metals/SVOCs, TCLP SVOCs] * 12-14' @ 1420 [PCBs and Cyanide] 18-20' @ 1423 [HOLD for PCBs]	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Chemical odors, no sheen
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-09
Location Description: AOC 2

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1200
Date/Time Finish: 10/ 07 /15 @ 1220

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
					1	(1-5'): Dry, loose, brown/white, fine GRAVEL and Silt, fine to medium sand (fill), ash/fire remnants.	
MC	-	4 / 5	0.2		2		
				Fill / Ash	3		
					4		
					5	(5-6'): Dry, loose, brown/white, fine GRAVEL and Silt, fine to medium sand (fill), ash/fire remnants.	
					6	(6-8.5'): Dry, hard, brown/grey mottled, SILT, little clay.	
MC	-	5 / 5	1.3	ML	7	(8.5-9.5'): Moist, loose, brown, fine SAND and Silt, trace medium sand.	
					8	(9.5-10'): Moist, loose, dark grey, fine SAND, some silt, trace petroleum odor.	
					9		
					10	(10-14'): Wet, loose, grey, fine SAND, little silt, little fine sub rounded gravel, trace medium sand, petroleum odor.	
					11		
MC	-	5 / 5	0.2		12	(14-15'): Wet, loose, grey/brown, fine SAND, some silt, petroleum odor, clay seam from 14.25-14.42'.	
					13		
				SM	14		
					15	Wet, loose, grey/brown, fine SAND, some silt, trace medium sand, petroleum odor, rainbow sheen, 1-inch clay seam at 18.5' and 19.33'.	
					16		
MC	-	5 / 5	0.2		17		
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: No Samples collected	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors, rainbow sheen from (15-16')

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-10
Location Description: AOC 2

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1320
Date/Time Finish: 10/ 07 /15 @ 1340

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-0.5'): Topsoil/grass	
					1	(0.5-3'): Dry, soft, brown, Silt/Gravel/Brick (fill)	
MC	-	4.5 / 5	0.2	Fill	2	(3-5'): Dry, loose, grey/white debris, ash/fire remnants.	
					3		
					4		
				ML	5	(5-8.5'): Dry, stiff, grey/brown mottled, SILT, little clay, trace fine rounded gravel.	
					6	(8.5-9.5'): Moist, soft, grey/brown, SILT and fine Sand.	
MC	-	5 / 5	0.3		7	(9.5-10'): Moist, loose, dark grey, fine SAND, little silt, little medium rounded gravel.	
					8		
					9		
				SM	10	(10-14.67'): Moist, loose, dark grey, fine SAND, little silt, little medium rounded gravel.	
			1.7		11	(14.67-15'): Wet, soft, grey/brown mottled, SILT and Clay, plastic, flight petroleum odor.	
MC	-	4 / 5			12		
			8.4		13		
					14		
				ML	15	Wet, loose, grey, fine to medium SAND, little silt, rainbow sheen, slight petroleum odor.	
					16		
MC	-	5 / 5	0.2	SM	17		
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: No Samples collected	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-11
Location Description: AOC 2

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1400
Date/Time Finish: 10/ 07 /15 @ 1420

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-0.5'): Topsoil/grass	
					1	(0.5-5'): Dry, soft, brown, Silt/angular Gravel/Brick (fill)	
MC	-	2 / 5	0.1	Fill	2		
					3		
					4		
					5	(5-8'): Dry, stiff, grey/brown mottled, SILT, some clay.	
					6	(8-10'): Moist, soft, brown, SILT and fine Sand, low plasticity.	
MC	-	4 / 5	0.1		7		
					8		
				ML	9		
					10	(10-14'): Wet, soft, brown, SILT and fine Sand, low plasticity.	
					11	(14-15'): Wet, loose, grey, fine SAND, little silt, little medium sand, trace fine rounded gravel, faint petroleum odor.	
MC	-	4 / 5	0		12		
					13		
					14		
					15	(15-19'): Wet, loose, grey, fine to medium SAND, little silt, rainbow sheen, slight rounded gravel, faint petroleum odor.	
					16		
MC	-	4 / 5	0.1	SM	17	(19-20'): Wet, loose, grey, fine SAND, little silt, trace fine sub rounded gravel 1-inch clay seam at 19', 19.25', and 19.5'.	
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: No Samples collected	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-12
Location Description:
AOC 2

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	4	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1150
Date/Time Finish: 10/ 07 /15 @ 1155

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-0.5'): Topsoil/grass	
					1	(0.5-4'): Dry, soft, brown, Silt/angular Gravel/Brick (fill)	
MC	-	1 / 4	0.1	Fill	2		
					3		
					4	End of Boring @ 4 ft. bgs (REFUSAL)	
					5	Samples Collected: No Samples collected	
					6		
					7		
					8		
					9		
					10		
					11		
					12		
					13		
					14		
					15		
					16		
					17		
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Refusal after 2 attempts

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-13
Location Description:
AOC 2

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1345
Date/Time Finish: 10/ 07 /15 @ 1355

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-0.5'): Topsoil/grass	
					1	(0.5-5'): Dry, soft, brown, Silt/angular Gravel/Debris (fill)	
MC	-	2.5 / 5	0.2		2		
				Fill	3		
					4		
					5	(5-6'): Dry, soft, brown, Silt/angular Gravel/Debris (fill)	
					6	(6-8.17'): Dry, stiff, grey/brown mottled, SILT, some clay, plastic.	
MC	-	5 / 5	0.2	ML	7	(8.17-9'): Dry, loose, brown, fine SAND and Silt, trace organics.	
				SM	8	(9-10'): Moist, stiff, brown, SILT, some fine sand, trace organics.	
					9		
					10	Moist, stiff, brown, SILT, some fine sand, trace organics.	
					11		
MC	-	5 / 5	0.2	ML	12		
					13		
					14		
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: No Samples collected	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-14
Location Description: AOC 2

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1125
Date/Time Finish: 10/ 07 /15 @ 1150

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-5'): Dry, soft, brown, Silt/little fine sand/ fine angular Gravel/Brick (fill)	
MC	-	4 / 5	0.1		2		
					3		
					4		
				ML	5	(5-9'): Dry, stiff, brown mottled, SILT, some clay, trace organics.	
					6	(9-10'): Moist, dark grey/brown, fine SAND, trace silt, trace medium sand, petroleum odor.	
MC	-	5 / 5	0.1		7		
					8		
				SM	9		
					10	(10-11'): Moist, dark grey/brown, fine SAND, trace silt, trace medium sand, petroleum odor.	
					11	(11-14.83'): Wet, loose, dark grey, fine SAND, trace silt, travel medium sand, trace fine rounded gravel, petroleum odor.	
MC	-	4 / 5	0.1		12		
					13	(14.83-15'): Wet, stiff, grey/brown, SILT and Clay, plastic.	
				ML	14		
				SM	15	Wet, loose, grey, fine to medium SAND, little silt, rainbow sheen, slight petroleum odor, sheen from (15-17').	
					16		
MC	-	4 / 5	0.1		17		
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: 12-14' @ 1146 [HOLD for PCBs] 18-20' @ 1147 [HOLD for PCBs]	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors
***** Sample marked for analysis; all other samples to be held at the lab

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-15
Location Description: AOC 2

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 1050
Date/Time Finish: 10/ 09 /15 @ 1100

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
					1	(1-3'): Dry, stiff, brown, SILT, little fine sand, little clay, trace organics (fill)	
MC	-	3 / 5	-	Fill	2	(3-3.83'): Dry, stiff, brown, SILT, little fine sand, little clay, trace organics, trace fine sub angular gravel (fill)	
					3	(3.83-5'): Concrete/Gravel/Silt/Brick (Fill)	
					4		
				ML	5	(5-7'): Moist, stiff, grey/brown mottled, SILT and Clay.	
					6	(7-9'): Moist, loose, brown, fine SAND, some silt.	
MC	-	4 / 5	-	SM	7	(9-10'): Moist, soft, dark grey, SILT, some fine sand, trace organics.	
					8		
					9		
				ML	10	(10-12'): Wood	
					11	(12-15'): Wet, loose, grey, fine SAND, little silt, faint petroleum odor.	
MC	-	4 / 5	-		12		
					13		
					14		
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: No Samples collected	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odor, step out 20' bgs east (SB-35).

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-16
Location Description:
Waste Oil Pit (Offsite)

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 06 /15 @ 1020
Date/Time Finish: 10/ 06 /15 @ 1050

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-5'): Dry, loose, sub angular gravel/little silt (fill).	
MC	-	1 / 5	0		2		
					3		
					4		
				ML	5	(5-8.25'): Dry, stiff, grey/brown mottled, SILT, some clay, trace fine rounded gravel.	
					6	(8.25-10'): Dry, loose, grey, fine SAND, some silt, trace organics, trace fine gravel, petroleum odor.	
MC	-	4.5 / 5	0		7		
					8		
					9		
					10	Dry, loose, grey, fine SAND, some silt, trace organics, trace fine gravel, petroleum odor. Bottom 6-inches has grey/white fine gravel.	
					11		
MC	-	3 / 5	0	SM	12		
					13		
					14		
					15	(15-18'): Dry, loose, grey, fine SAND, some silt, trace organics, trace fine gravel, petroleum odor.	
					16		
MC	-	3 / 5	0		17	(18-20'): Wet, loose, grey, fine SAND, travel silt, trace clay, trace fine rounded, gravel, very slight petroleum odor.	
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: 10-12' @ 1048 [PCBs] 18-20' @ 1050 [PCBs]	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-17
Location Description:
Waste Oil Pit (Offsite)

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	24	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 06 /15 @ 0935
Date/Time Finish: 10/ 06 /15 @ 1005

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-5'): Dry, loose, sub angular gravel/little silt (fill)	
MC	-	2 / 5	0		2		
					3		
					4		
					5	(5-7'): Dry, loose, sub angular gravel/little silt (fill)	
					6	(7-8'): Dry stiff, grey/brown mottled, SILT, some clay, trace fine rounded gravel.	
MC	-	5 / 5	0	ML	7	(8-10'): Moist, loose, grey, fine SAND and Silt, trace organics, petroleum odor.	
					8		
					9		
					10	Wet, loose, grey, fine SAND, some silt, trace fine gravel, slight petroleum odor.	
					11		
MC	-	4 / 5	0		12		
					13		
					14		
				SM	15	(15-19'): Wet, loose, grey, fine SAND, some silt, trace fine gravel, slight petroleum odor, rainbow sheen.	
					16		
MC	-	5 / 5	0		17	(19-20'): Wet, loose, grey, fine SAND, little silt, organic odor.	
					18		
					19		
					20	(20-22'): Wet, loose, grey, fine SAND, little silt, very slight petroleum odor, rainbow sheen.	
					21		
MC	-	5 / 5	0	ML	22	(22-24'): Wet, medium still, dark grey, SILT and Clay, some fine sand, some fine gravel.	
					23		
					24	End of Boring @ 24 ft. bgs [REFUSAL]	
					25	Samples Collected: 8-10' @ 0945 [PCBs] 22-24' @ 0946 [PCBs]	

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors, rainbow sheen

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-18
Location Description:
Waste Oil Pit (Offsite)

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 06 /15 @ 0840
Date/Time Finish: 10/ 06 /15 @ 0920

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-5'): Moist, soft, brown, SILT, little clay, some coarse sub angular gravel.	
MC	-	4 / 5	0		2		
					3		
					4		
				ML	5	(5-8.5'): Dry, stiff, light brown, SILT, little clay, low plasticity, trace fine gravel.	
					6		
MC	-	5 / 5	0		7	(8.5-10'): Moist, stiff, grey/brown mottled, SILT, some clay, some fine sand petroleum odor.	
					8		
					9		
					10	(10-11.5'): Moist, stiff, grey/brown mottled, SILT, some clay, some fine sand petroleum odor.	
					11		
MC	-	4.5 / 5	0		12	(11.5-15'): Moist, soft, grey, SILT, some clay, some fine sand, trace organics, trace fine gravel, faint petroleum odor.	
					13		
					14		
					15	(15-71.5'): Wet, soft, grey, SILT, some clay, some fine sand, trace organics, trace fine gravel, faint petroleum odor.	
					16		
MC	-	4.5 / 5	0		17	(17.5-20'): Wet, stiff, grey/brown mottled, SILT and fine Sand, trace fine gravel,very faint petroleum odor.	
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21	Samples Collected: 7-9' @ 0915 [PCBs] 10-12' @ 0916 [PCBs, Cyanide] 10-12' @ 0930 [SVOCs + 20 TICS] 18-20' @ 0917 [PCBs]	
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-19
Location Description:
Offsite Petroleum Inv.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1505
Date/Time Finish: 10/ 07 /15 @ 1530

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-5'): Dry, soft, brown, silt/clay/coarse sub angular gravel (Fill)	
MC	-	4 / 5	0.2		2		
					3		
					4		
					5	(5-6.5'): Dry, soft, brown, silt/clay/coarse sub angular gravel (Fill)	
					6	(5.5-10'): Moist, hard, grey/brown mottled, SILT, little clay, plastic.	
MC	-	4.8 / 5	0.2	ML	7		
					8		
					9		
					10	(10-13.5'): Moist, hard, grey/brown mottled, SILT, little clay, plastic.	
					11	(13.5-15'): Wet, loose, grey, fine SAND, little silt, trace medium sand, trace organics, very faint petroleum odor.	
MC	-	4 / 5	0.2		12		
					13		
					14		
					15	(15-17'): Wet, loose, grey, fine SAND, little silt, trace medium sand, trace organics, very faint petroleum odor.	
					16	(17-17.5'): Clay seam	
MC	-	4 / 5	0.2	SM	17	(17.5-20'): Wet, loose, brown, fine SAND, little silt, trace medium sand, no odors no sheens.	
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21	Samples Collected: 15-17' @ 1526 [PCBs]	
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors

Contractor:	Zebra		**BORING/** Page 1 of 1
Driller:	Joe Hutchins/ Ronnell Royall		**WELL NO. SB-20**
Oversight:	Sara Weishaupt	**PROJECT NAME:** Former Brown Manufacturing Site	**Location Description:**
Rig Type:	Geoprobe (Track Mount)	**PROJECT Locatio** Syracuse, NY	Waste Oil Pit (Offsite)

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1440
Date/Time Finish: 10/ 07 /15 @ 1500

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-0.5'): Topsoil/grass	
					1	(0.5-1'): Brick	
MC	-	4.5 / 5	0	Fill	2	(1-4'): Hard, dry, brown, SILT, trace fine round gravel.	
					3	(4-4.5'): Ash/fire debris	
					4	(4.5-5'): Moist, stiff, brown, SILT and Clay, trace organics.	
					5	Moist, stiff, grey/brown, SILT, little clay.	
					6		
MC	-	5 / 5	0.1	ML	7		
					8		
					9		
					10	(10-10.5'): Wet, stiff, grey/brown mottled, SILT, little clay.	
					11	(10.5-15'): Wet, loose, grey, fine SAND, little silt, trace medium sand, little silt, trace medium sand, wood fragments at bottom, very slight petroleum odor.	
MC	-	3 / 5	0.1		12		
				SM	13		
					14		
					15	(15-16.5'): Wet, loose, grey, fine and medium SAND, little silt ,very faint petroleum odor.	
					16	(16.5-17'): Wood	
				Wood			
MC	-	5 / 5	0.1		17	(17-20'): Wet, loose, grey, fine SAND, little silt, trace fine gravel, no odors/sheens.	
				SM	18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21	Samples Collected: No Samples Collected	
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-21
Location Description:
Offsite Petroleum Inv.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 0900
Date/Time Finish: 10/ 07 /15 @ 0920

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
					1	(1-3'): Dry, loose, brown, fine Gravel/silt/ organics.	
MC	-	4 / 5	0.1	Fill	2	(3-3.5'): Gravel and Brick	
					3	(3.5-4'): Hard, dry, SILT, trace clay, trace fine gravel (fill).	
					4	(4-5'): Dry, white, fine SAND/gravel (fill).	
					5	(5-9.5'): Dry, hard, grey/brown mottled, SILT, little clay, trace fine sand, trace organics.	
					6	(9.5-10'): Moist, soft, dark brown, SILT, little clay, trace fine sand, trace organics.	
MC	-	5 / 5	0.1	ML	7		
					8		
					9		
					10	(10-14.5'): Wet, loose, grey, fine SAND, little medium sand, little silt, little organics.	
					11	(14.5-15'): Wood fragments	
MC	-	2 / 5	0.2	SM	12		
					13		
					14		
				Wood			
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: No Samples collected	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-22
Location Description:
Waste Oil Pit (Offsite)

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 0930
Date/Time Finish: 10/ 07 /15 @ 1000

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-0.5'): Topsoil/grass	
					1	(0.5-3.5'): Dry, hard, brown ,SILT and Clay	
MC	-	4 / 5	0.2	Fill	2	(3.5-5'): Dry, loose, brown and white, gravel/silt/ash.	
					3		
					4		
					5	(5-6'): Dry, loose, brown and white, gravel/silt/ash.	
				ML	6	(6-8.5'): Dry, hard, grey/brown mottled, SILT and Clay, trace fine rounded gravel.	
MC	-	5 / 5	0.2		7		
					8	(8.5-10'): Dry, loose, grey, fine SAND, trace silt.	
					9		
					10	Wet, loose, dark grey, fine to medium SAND, trace silt, trace fine gravel, slight petroleum odor, rainbow sheen from 14-15'.	
					11		
MC	-	4.5 / 5	0.2	SM	12		
					13		
					14		
					15	(15-16'): Wet, loose, dark grey, fine to medium SAND, trace silt, trace fine gravel, slight petroleum odor, rainbow sheen.	
				CL	16	(16-16.5'): Clay seam	
MC	-	5 / 5	0.2	CL/SM	17	(16.5-17'): Clay and fine Sand lenses.	
				SM	18	(17-19'): Wet, loose, grey, fine SAND, little silt.	
				CL	19	(19-19.5'): Clay seam	
				SM		(19.5-20'): Wet, loose, brown, fine SAND, little silt.	
					20	End of Boring @ 20 ft. bgs	
					21	Samples Collected: 13-15' @ 0952 [PCBs, SVOCs + 20 TICS] 18-20' @ 0953 [PCBs - HOLD pending 13-15' results]	
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors, rainbow sheen

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-23
Location Description:
Offiste Petroleum Inv.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 07 /15 @ 1010
Date/Time Finish: 10/ 07 /15 @ 1055

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-4.5'): Dry, hard, brown ,SILT trace organics, trace silt.	
MC	-	4 / 5	0.5		2	(4.5-5'): Dry, loose, brown and white, gravel/silt/ash.	
					3		
					4		
					5	(5-5.5'): Dry, loose, brown and white, gravel/silt/ash.	
				ML	6	(5.5-8.08'): Dry, hard, brown, SILT and Clay, trace organics.	
MC	-	5 / 5	0.2		7	(8.08-9.67'): Dry, dense, brown, fine SAND and Silt.	
				SM	8	(9.67-10') : Moist, soft, grey, SILT and Clay, little fine sand, petroleum odor.	
					9		
					10	(10-13.5') : Moist, soft, grey, SILT and Clay, little fine sand, petroleum odor.	
				ML	11	(13.5-14'): Wet, loose, grey, fine SAND and Silt, trace organics, petroleum odor.	
MC	-	4.5 / 5	0.2		12	(14-15'): Wet, loose, grey, fine to medium SAND, little silt, trace organics, petroleum odor.	
					13		
					14		
				SM	15	(15-17'): Wet, loose, grey, fine to medium SAND, little silt, trace organics, petroleum odort.	
					16	(17-17.25'): Wet, stiff, brown, SILT.	
MC	-	4 / 5	0.2	ML	17	(17.25-18.5'): Wet, loose, dark grey, fine SAND, little silt, clay seam from 18-18.5'.	
				SM	18		
					19	(18.5-20'): Wet, loose, brown, fine SAND, little silt, trace medium sand, no odors, no sheens.	
					20	End of Boring @ 20 ft. bgs	
					21	Samples Collected: 13-15' @ 1037 [PCBs] - Hold pending results of SB-22	
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odors.

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-26
Location Description:
Contingency PDI Borinh

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 0921
Date/Time Finish: 10/ 09 /15 @ 0946

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-3.5'): Brick/Fill and Ash/Fire debris.	
MC	-	3 / 5	0.3		2	(3.5-4.5'): Dry, loose, grey, fine SAND, some silt, travel gravel.	
					3	(4.5-5'): Dry, loose, white, fine SAND, little fine gravel.	
					4		
				ML	5	(5-6.5'): Dry, soft, brown, SILT, little clay, trace fine sand, petroleum odor.	
					6	(6.5-10'): Dry to moist, stiff, brown, SILT and Clay, petroleum odor, rainbow sheen.	
MC	-	3.5 / 5	-		7		
					8		
					9		
				SM	10	(10-13.5'): Wet, loose, grey/brown, fine SAND, little silt, trace medium sand, slight petroleum odor.	
					11	(13.5-15'): Wet, loose, grey, fine SAND and Silt, 4-inch clay seam at 14.17'.	
MC	-	4 / 5	-		12		
					13		
				CL/ML SM	14		
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: 1-1.5' @ 940	
					18	2-2.5' @ No Sample Collected [Brick]	
					19	3-3.5' @ 941 4-4.5' @ 943	
					20	5-5.5' @ 944 * 6-6.5' @ 945	
					21	7.5-8' @ 946	
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odor, rainbow sheen
***** Sample marked for analysis; all other samples to be held at the lab
PID not reading properly due to rain (moisture)

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-28
Location Description:
Waste Oil Pit Inv.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 06 /15 @ 1300
Date/Time Finish: 10/ 06 /15 @ 1325

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-3.5'): Brick/Fill and Ash/Fire debris.	
MC	-	4.5 / 5	0		2	(3.5-4.5'): Dry, loose, grey, fine SAND, some silt, travel gravel.	
					3	(4.5-5'): Dry, loose, white, fine SAND, little fine gravel.	
					4		
				ML	5	(5-8'): Dry, hard, grey/brown mottled, SILT, trace fine sand.	
					6	(8-9.5'): Dry loose, brown, fine SAND, little silt, trace organics.	
MC	-	4.5 / 5	0		7	(9.5-10'): Moist, loose, grey, fine SAND, little silt, slight petroleum odor, trace organics.	
				SM	8		
					9		
					10	(10-14'): Wet, loose, grey, fine SAND, little silt, slight petroleum odor, trace organics.	
					11		
MC	-	4.5 / 5	0		12	(14-15'): Wet, loose, grey, fine SAND and Silt, trace medium rounded gravel, slight petroleum odor, rainbow sheen.	
					13		
					14		
					15	(15-17'): Wet, loose, grey, fine SAND and Silt, trace medium rounded gravel,	
					16	(17-17.5'): Moist, stiff, brown, SILT and Clay.	
MC	-	5 / 5	0	CL	17	(17.5-20'): Wet, loose, brown, fine SAND, little to some silt, organic odor.	
				SM	18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21	Samples Collected: No Samples Collected	
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
Petroleum odor, rainbow sheen

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-29
Location Description:
Offsite Petroleum Inv.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 06 /15 @ 1330
Date/Time Finish: 10/ 06 /15 @ 1350

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-0.5'): Topsoil/grass	
					1	(0.5-2.83'): Brick/Fill and Ash/Fire debris (fill).	
MC	-	4.5 / 5	0	Fill	2	(3.5-4.5'): Dry, loose, grey, fine SAND, some silt, travel gravel (fill).	
					3	(4.5-5'): Dry, loose, white, fine SAND, little fine gravel.	
					4		
					5	(5-9.5'): Moist, loose, brown, fine SAND and Silt, trace organics.	
					6	(9.5-10'): Moist, loose, grey, fine SAND and Silt, trace organics, organic odor.	
MC	-	3 / 5	0		7		
					8		
				SM	9		
					10	(10-14.5'): Moist to wet, loose, grey, fine SAND, little silt, little fine to medium gravel.	
					11	(14.5-15'): Wet, stiff, brown, SILT, little clay, plastic.	
MC	-	4 / 5	0		12		
					13		
					14		
				ML			
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: 12-14' @ 1350 [PCBs and SVOCs + 20 TICS]	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
This location is a 20 ft. offset from SB-28.

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-30
Location Description:
Waste Oil Pit Inv.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 06 /15 @ 1400
Date/Time Finish: 10/ 06 /15 @ 1415

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
					1	(1-4'): Dry, soft, brown, SILT, trace fine sand, trace organics.	
MC	-	2 / 5	0		2	(4-5'): Dry, hard, brown, SILT and Clay, trace fine sand, trace fine gravel.	
					3		
					4		
				ML	5	(5-9'): Dry, stiff, grey/brown mottled, SILT, little clay, trace fine gravel.	
					6	(9-10'): Moist, loose, grey, fine SAND, little silt.	
MC	-	4 / 5	0		7		
					8		
					9		
					10	(10-14'): Moist, loose, grey, fine SAND, little silt.	
					11	(14-15'): Wet, loose, brown, fine SAND, little silt, trace medium sand.	
MC	-	4 / 5	0	SM	12		
					13		
					14		
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: 12-14' @ 1350 [PCBs HOLD pending results of SB-29]	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
This location is a 20 ft. offset from SB-29.

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-31
Location Description:
Offsite Petroleum Inv.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 06 /15 @ 1420
Date/Time Finish: 10/ 06 /15 @ 1510

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-3.5'): Dry, hard, brown, SILT, some fine gravel.	
MC	-	3 / 5	0		2	(3.5-4.5'): Dry, white, Ash/Fire debris.	
					3	(4.5-5'): Dry, soft, brown, SILT, trace fine sand.	
					4		
				ML	5	(5-8.5'): Dry, soft, brown, SILT, trace fine sand.	
					6	(8.5-9'): Dry, loose, brown, fine SAND.	
MC	-	5 / 5	0		7	(9-10'): Moist, loose, grey, fine SAND, little silt, slight petroleum odor, trace wood fragments.	
					8		
					9		
				SM	10	Wet, loose, grey, fine to medium SAND, little silt, trace fine to medium gravel, trace organics, slight petroleum odor from 12-15'.	
					11		
MC	-	5 / 5	0		12		
					13		
					14		
					15	(15-18.5'): Wet, loose, grey, fine SAND, trace silt, petroleum odor, raibnow sheen.	
					16	(18.5-19'): Wet, medium stiff, brown, SILT and Clay seam.	
MC	-	4 / 5	0		17	(19-20'): Wet, loose, grey/brown fine SAND, little silt, no odors or sheens.	
					18		
				ML	19		
				SM	20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: 10-12' @ 1350 [PCBs HOLD pending results of SB-29] 18-20' @ 1510 [PCBS]	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
This location is an offset of SB-16 and SB-17.

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-32
Location Description:
Offsite 141 Bellevue Ave.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 1300
Date/Time Finish: 10/ 08 /15 @ 1325

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-2.83'): Dry, loose, brown, fine SAND, little silt, trace organics.	
MC	-	4.5 / 5	0		2	(2.83-4'): Dry, soft, brown, SILT, little fine angular gravel, trace find sand.	
					3	(4-5'): Dry, hard, brown, SILT, some brick and fine gravel, trace fine sand.	
					4		
					5	(5-6'): Dry, hard, brown, SILT, some brick and fine gravel, trace fine sand.	
				Brick	6	(6-6.5'): Brick	
MC	-	5 / 5	0	SM	7	(6.5-7.75'): Dry, loose, brown ,fine SAND, little silt, trace organics.	
				ML	8	(7.75-9.33'): Dry, hard, brown ,SILT, little clay, trace organics.	
					9	(9.33-10'): Moist, loose, grey, fine SAND, some silt, little fine gravel, petroleum odor.	
				SM	10	(10-14.33'): Wet, loose, grey, fine SAND, little silt, little fine sub angular gravel, petroleum odor, rainbow sheen.	
					11		
MC	-	4.5 / 5	0.2		12	(14.33-15'): Wet, loose, grey, fine SAND, little medium sand, little silt, very faint petroleum odor.	
					13		
					14		
					15	(15-16'): Wet, loose, grey, fine SAND, little medium sand, little silt, very faint petroleum odor.	
				CL/ML	16	(16-16.5'): Clay seam	
MC	-	4.5 / 5	0.1		17	(16.5-17.58'): Wet, loose, brown, fine SAND, little medium sand, trace silt, no odors or sheens.	
				SM	18		
					19	(17.58-20'): Wet, loose, brown, fine SAND and Silt, trace medium sand.	
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: 10-12' @ 1350 [PCBs] 16-18' @ 1510 [PCBS HOLD]	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-33
Location Description:
Offsite 141 Bellevue Ave.

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 08 /15 @ 1325
Date/Time Finish: 10/ 08 /15 @ 1340

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				ML	1	(1-3'): Dry, hard, brown, SILT, trace fine sand, trace organics.	
MC	-	4.5 / 5	0		2	(3-3.75'): Dry, loose, brown, fine SAND, trace silt.	
				SM	3	(3.75-4.33'): Dry, loose, brown, SILT, little fine sand, trace fine gravel.	
				ML	4	(4.33-5'): Dry, hard, brown, SILT and Clay.	
				Brick	5	(5-5.5'): Brick	
				ML	6	(5.5-7.58'): Dry, hard, brown, SILT and Clay.	
MC	-	5 / 5	0		7	(7.58-8.83'): Dry, loose, brown, fine SAND, little silt.	
					8	(8.83-10'): Moist, loose, brown, medium SAND, some fine sand, little silt.	
					9		
					10	Wet, loose, grey, fine to medium SAND, little silt, trace fine gravel, 1-inch clay seam at 13.25' and 14.33'.	
				SM	11		
MC	-	4.5 / 5	0		12		
					13		
					14		
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: No Samples Collected	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
This location is a 20' offset of SB-32.

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-34
Location Description:
Offsite 20 ft south of SB-19

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 0900
Date/Time Finish: 10/ 09 /15 @ 0915

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-4'): Dry, loose, gravel/silt/brick (fill).	
MC	-	2 / 5	0.1		2	(4-5'): Dry, soft, brown, SILT, trace fine sand, trace fine gravel (fill).	
					3		
					4		
				Brick	5	(5-6'): Brick	
				ML	6	(6-10'): Moist, still, grey/brown mottled, SILT and Clay, plastic.	
MC	-	5 / 5	0.1		7		
					8		
					9		
				SM	10	(10-14'): Wet, loose, brown, fine to medium SAND, little silt ,trace fine gravel.	
					11	(14-15'): Wet, loose, grey, fine to medium SAND, little silt, little fine gravel, no odors/sheens.	
MC	-	3 / 5	0.2		12		
					13		
					14		
				ML	15	Wet, soft, brown, SILT, some clay.	
					16		
MC	-	0.5 / 5	0.3		17		
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: 18-20' @ 0910 [SVOCs + 20 TICS; PCBs HOLD]	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-35
Location Description:
Offsite Waste Oil Pit

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 1100
Date/Time Finish: 10/ 09 /15 @ 1120

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-2'): Brick	
MC	-	3 / 5	0		2	(2-4.5'): Silt/Grave;/Brick/Sand (fill)	
					3	(4.5-5'): Dry, brown, stiff, silt/sand/brick (fill)	
					4		
				ML	5	(5-6'): Dry, stiff, brown, SILT and Clay, trace organics.	
				SM	6	(6-8'): Dry, loose, brown, fine SAND, trace silt.	
MC	-	5 / 5	0		7	(8-10'): Moist, dark brown, soft, SILT, little clay, trace fine sand.	
				ML	8		
					9		
					10	(10-12'): Moist, dark brown, soft, SILT, little clay, trace fine sand.	
					11	(12-15'): Wet, loose, grey, fine to medium SAND, little silt, trace to little fine gravel, black silt from 14.5-15'.	
MC	-	4 / 5	0		12		
					13		
					14		
				SM	15	Wet, loose, grey, fine to medium SAND, little silt, rainbow sheen, trace to little fine gravel.	
					16		
MC	-	4 / 5	0		17		
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: 6-8' @ 1115 [PCBs] 8-10' @ 1116 [PCBs HOLD] 16-18' @ 1117 [PCBs HOLD]	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
This location is 20' east offset from SB-15.

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-36
Location Description:
Offsite Waste Oil Pit

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	15	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 1120
Date/Time Finish: 10/ 09 /15 @ 1130

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-5'): Dry, soft, brown, Silt/Sand/ fine to medium sand, gravel, brick (fill)	
MC	-	3 / 5	0		2		
					3		
					4		
				ML	5	(5-6.5'): Dry, stiff, grey/brown mottled, SILT and Clay, trace organics.	
					6	(6.5-9.5'): Dry, loose, dark grey, fine SAND, little silt, trace organics.	
MC	-	4 / 5	0		7	(9.5-10'): Moist, loose, dark grey, fine SAND, little silt, trace medium sand, petroleum odor.	
					8		
					9		
				SM	10	Wet, loose, grey, fine SAND, little medium sand, little silt, trace fine gravel, slight petroleum odor.	
					11		
MC	-	4 / 5	0		12		
					13		
					14		
					15	End of Boring @ 15 ft. bgs	
					16		
					17	Samples Collected: No Samples Collected	
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
This location is a 20' east offset of SB-14

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-37
Location Description:
Offsite Waste Oil Pit

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	13	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 1130
Date/Time Finish: 10/ 09 /15 @ 1135

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-5'): Dry, soft, brown, Silt/Sand/ fine to medium sand, gravel, brick (fill)	
MC	-	2 / 5	0		2		
					3		
					4		
				-	5	No recovery	
					6		
MC	-	0 / 5	0		7		
					8		
					9		
				SM	10	Wet, loose, grey, fine SAND, little silt, trace medium sand, very faint petroleum odor.	
					11		
MC	-	2 / 3	0		12		
					13	End of Boring @ 13 ft. bgs [REFUSAL]	
					14		
					15		
					16	Samples Collected: 10-12' @ 1140 [SVOCs + 20 TICS; PCBs HOLD]	
					17		
					18		
					19		
					20		
					21		
					22		
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:
This location is a 20' east offset of SB-36

Contractor: Zebra
Driller: Joe Hutchins/ Ronnell Royall
Oversight: Sara Weishaupt
Rig Type: Geoprobe (Track Mount)

PROJECT NAME: Former Brown Manufacturing Site
PROJECT Locatio Syracuse, NY

BORING/ Page 1 of 1
WELL NO. SB-38
Location Description:
Offsite Waste Oil Pit

GROUNDWATER OBSERVATIONS		
Apparent Borehole DTW:		ft bls
Measured Water Level:	NA	ft bls
Total Depth of Boring:	20	ft bls
Additional Comments:	NA	
No water encountered		

Date/Time Start: 10/ 09 /15 @ 1200
Date/Time Finish: 10/ 09 /15 @ 1215

Location Plan

Sample Type	SPT	Recovery (ft)	PID (ppm)	USCS Symbol	Depth (ft bls)	DESCRIPTION	COMMENTS
				Topsoil / Grass	0	(0-1'): Topsoil/grass	
				Fill	1	(1-2'): Ash/debris	
MC	-	3 / 5	-		2	(2-3'): Brown/tan fill/brick.	
				ML	3	(3-5'): Dry, stiff, grey/brown, SILT and Clay.	
					4		
					5	(5-7'): Dry, stiff, grey/brown, SILT and Clay.	
					6	(7-9.5'): Moist, loose, brown, fine SAND, little silt, trace medium sand.	
MC	-	5 / 5	-		7	(9.5-10'): Moist, loose, grey, fine SAND, some silt.	
					8		
					9		
				SM	10	(10-14'): Wet, loose, grey, fine to medium SAND, little silt, trace fine gravel, very faint petroleum odor.	
					11	(14-15'): Wet, stiff, grey/brown mottled, SILT and Clay, plastic.	
MC	-	4 / 5	-		12		
					13		
				ML	14		
				SM	15	Wet, loose, grey, fine to medium SAND, little silt, rainbow sheen, slight petroleum odor, 2-inch clay seam at 18' and 19'.	
					16		
MC	-	5 / 5	-		17		
					18		
					19		
					20	End of Boring @ 20 ft. bgs	
					21		
					22	Samples Collected: No Samples Collected	
					23		
					24		
					25		

SAMPLING METHOD
HC = Hand Cleared (post hole)
SS= Split Spoon
MC=Macrocore

COMMENTS:

APPENDIX D
MONITORING WELL
CONSTRUCTION LOGS

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **NRC**

LOCATION **101 Chester Street, Syracuse NY**

HOLE NO. MW-3R
JOB NUMBER: **17111A**
SURF. EL.
DATE STARTED: **10/11/17**
DATE COMPLETED: **10/12/17**

GROUNDWATER DEP WHILE DRILLING **11.0'**

BEFORE CASING REMOVED **13.1'**

AFTER CASING REMOVED **12.2'**

N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING "/ OR PERCENT CORE RECOVERY

CASING TYPE **HOLLOW STEM AUGER**

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"		N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
							No Sampling 0.0'-5.0'	
5.0								
	5.0'-	**1**					**Gray moist SILT, some fine to coarse sand, litte clay**	
	7.0'							
	7.0'-	**2**						**7.5'**
	9.0'						**Gray brown moist CLAY, little silt**	
10.0	**9.0'-**	**3**						**9.7'**
WL▼	**11.0'**						**Gray brown moist SILT, little clay, little fine sand**	
	11.0'-	**4**						**11.0'**
	13.0'						**Gray wet fine to coarse SAND, little fine gravel, trace silt**	
	13.0'-	**5**						
15.0	**15.0'**							**15.0'**
20.0							**Bottom of Boring**	
25.0							**Installed 2" PVC well to 15'** **10' .010 PVC screen** **PVC riser**	
30.0								
35.0								
40.0								

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **NRC**

LOCATION **101 Chester Street, Syracuse NY**

GROUNDWATER DEPTH
WHILE DRILLING

BEFORE CASING
REMOVED

AFTER CASING
REMOVED

CASING TYPE **HOLLOW STEM AUGER**

HOLE NO. MW-4R
JOB NUMBER: **17111A**
SURF. EL.
DATE STARTED: **10/11/17**
DATE COMPLETED: **10/12/17**

N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER
FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER
FALLING "/ OR PERCENT CORE RECOVERY

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"		N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
							No Sampling 0.0'-15.0'	
5.0								
10.0								
WL▼								
15.0								**15.0'**
							Bottom of Boring	
20.0								
							Installed 2" PVC well to 15'	
							10' .010 PVC screen	
25.0							**PVC riser**	
30.0								
35.0								
40.0								

CME Associates, Inc.

Construction Materials Evaluation

August 7, 1998

C & H Engineers, P.C.
431 East Fayette Street
Syracuse, NY 13202

Attn: Mr. Stephen Mahana

Re: Monitoring Well Installation and Development
Former Brown Manufacturing Site
Syracuse, NY
NYSDEC Project No.: B-00024-7
CME Report No.: 4663B-01-0898

Gentlemen:

CME Associates, Inc. (CME) has completed Monitoring Well Installation and Development as requested for the former Brown Manufacturing Site Project. Work was performed by CME during the period of July 27 to August 1, 1998. Our services consisted of the installation of five (5) monitoring wells and the development of wells following installation. Monitoring Well Installation Details are attached for each well.

CME provided a truck mounted Central Mine Equipment Model 55 rotary drill rig for the well installation. The wells were installed to depths varying from 14.0' to 16.0' below the ground surface using 4-1/4" ID hollow stem augers in accordance with NYSDEC guidelines. A flush mounted protective casing with locking cap was installed at each well head for protection. All drill tool was decontaminated between well borings using a steam cleaner and citrus based cleaner. All excess drill cuttings were placed in 55 gallon drums and stored on site. A CME Geologist was on site much of the project for quality assurance.

CME developed the wells following installation using a combination of surging and bailing with a 2" bailer and pumping with a portable moyno pump. Each well was developed for an hour or more and at least 25 gallons of water was removed from each well. All waste water was transferred to 55 gallon drums and stored on site.

Please contact the undersigned if you have any questions regarding the services provided.

Sincerely,

CME ASSOCIATES, INC.

Douglas F. Hurlbut
Senior Geologist

Attachments: Groundwater Observation Well Reports (5 of 5)

CME Associates, Inc.

GROUND WATER OBSERVATION WELL REPORT

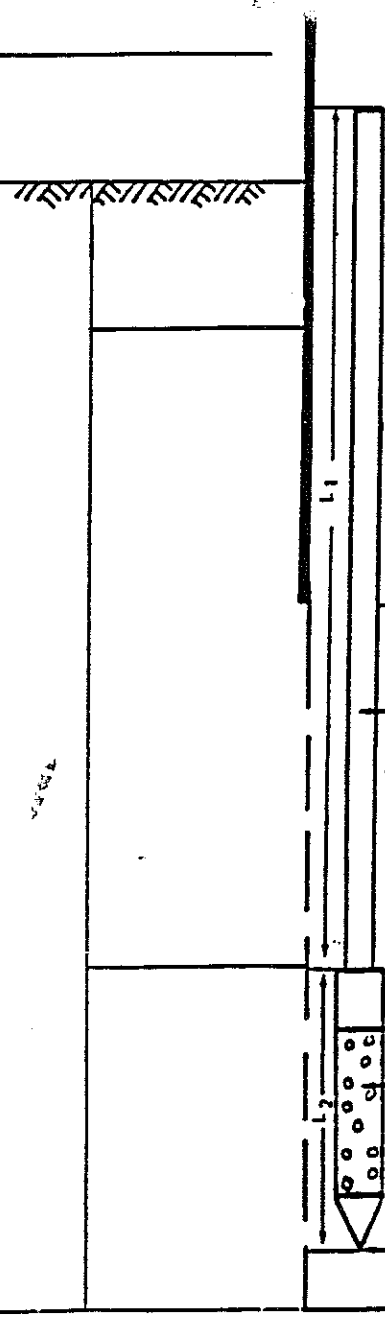
PROJECT: Brown Manufacturing Site
LOCATION: NYSDEC Project B-00024-T, Syracuse, NY
CLIENT: C&H Engineers, P.C.
CONTRACTOR: CME Associates, Inc.
DRILLER: Al Linstruth INSPECTOR: Doug Hurlbut
INSTALLATION DATE July 27, 1998

FILE NO. 41663
WELL NO. MW-1
BORING NO. MW-1
LOCATION See Well Location Plan
SHEET 1 OF 1

SURVEY DATUM

GROUND ELEVATION

SUMMARIZE SOIL CONDITIONS (NOT TO SCALE)



STICKUP ABOVE GROUND SURFACE OF CASING	Flush Mount Curb Box
ELEVATION STICKUP ~~ABOVE~~ Below GROUND SURFACE OF RISER PIPE.	-2"
THICKNESS OF SURFACE SEAL	6" 5000 psi Concrete 0.0' to 0.5'
TYPE OF SURFACE SEAL	Bentonite Chips 3.0' to 5.0'
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]	
TYPE OF CASING	12" Galvanized Steel
INSIDE DIAMETER OF CASING	8"
ELEVATION/DEPTH OF BOTTOM OF CASING	12"
INSIDE DIAMETER OF RISER PIPE	2" Sch. 40 PVC
TYPE OF BACKFILL AROUND RISER	Soil Cuttings 0.5'-3.0'
DIAMETER OF BOREHOLE	8"
	Silica Sand 5.0'-20.0'
ELEVATION/DEPTH OF BOTTOM OF RISER	6.0'
TYPE OF POINT OR MANUFACTURER	Sch. 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS	0.010"
DIAMETER OF WELLPOINT	2" I.D.
TYPE OF BACKFILL AROUND POINT	Morie #0 Silica
ELEVATION/DEPTH OF BOTTOM OF POINT	16.0'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	20.0'

[FIGURES REFER TO: EL. ____ DEPTH ____]

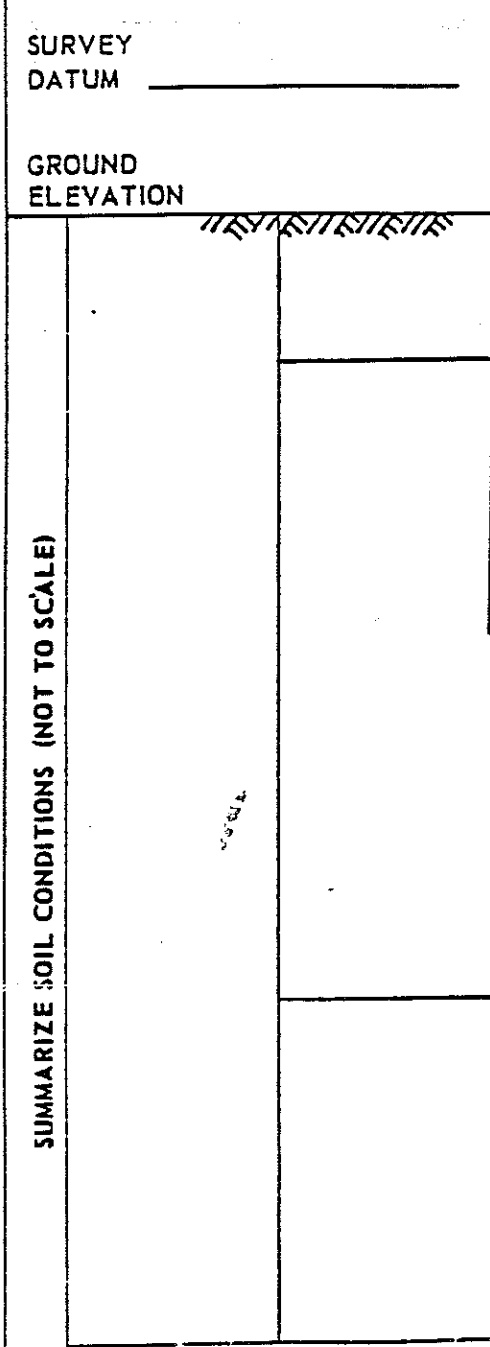
[ft. / LENGTH OF CASING L_3] [ft. / LENGTH OF RISER PIPE (L_1) + ft. / LENGTH OF POINT (L_2) = ft. / PAY LENGTH]

CME Associates, Inc.

GROUND WATER OBSERVATION WELL REPORT

PROJECT: Brown Manufacturing Site
LOCATION: NYSDEC Project B-00024-7, Syracuse NY
CLIENT: Ci H Engineers, P.C.
CONTRACTOR: CME Associates, Inc.
DRILLER: Al Linstruth INSPECTOR: Doug Hurlbut
INSTALLATION DATE July 28, 1998

FILE NO. 4663
WELL NO. MW-2
BORING NO. MW-2
LOCATION See Well Location Plan
SHEET 1 OF 1



STICKUP ABOVE:

GROUND SURFACE OF CASING: Flush Mount Curb Box

ELEVATION STICKUP ~~ABOVE~~ Below GROUND SURFACE OF RISER PIPE: -2"

6" 5000 psi Concrete 0.0' to 0.5'

THICKNESS OF SURFACE SEAL

TYPE OF SURFACE SEAL: Bentonite Chips 2.0' to 4.0'

[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]

TYPE OF CASING: 12" Galvanized Steel

INSIDE DIAMETER OF CASING: 8"

ELEVATION/DEPTH OF BOTTOM OF CASING: 12"

INSIDE DIAMETER OF RISER PIPE: 2" Sch. 40 PVC

TYPE OF BACKFILL AROUND RISER: Soil Cuttings 0.5'-2.0'

DIAMETER OF BOREHOLE: 8"

Silica Sand 4.0'-16.0'

ELEVATION/DEPTH OF BOTTOM OF RISER: 5.0'

TYPE OF POINT OR MANUFACTURER: Sch. 40 PVC

SCREEN GAUGE OR SIZE OF OPENINGS: 0.010"

DIAMETER OF WELLPOINT: 2" I.D

TYPE OF BACKFILL AROUND POINT: Morie #0 Silica

ELEVATION/DEPTH OF BOTTOM OF POINT: 15.0'

ELEVATION/DEPTH OF BOTTOM OF BOREHOLE: 16.0'

[FIGURES REFER TO: EL. ____ DEPTH ____]

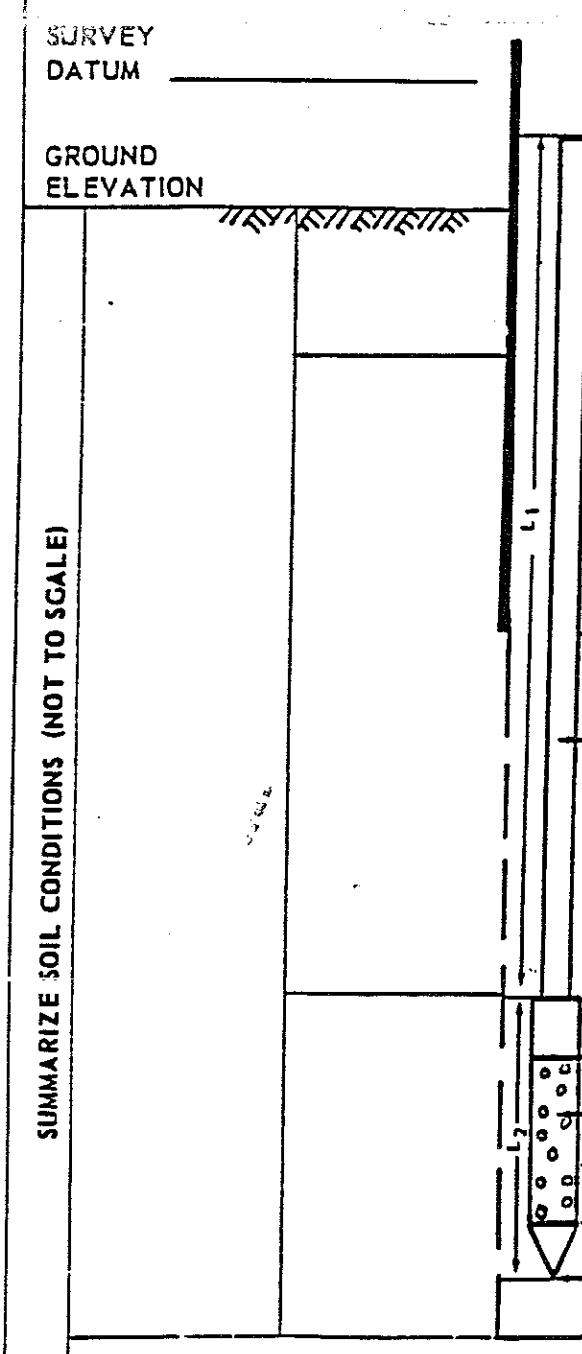
[ft. / LENGTH OF CASING L_3] [ft. / LENGTH OF RISER PIPE (L_1) + ft. / LENGTH OF POINT (L_2) = ft. / PAY LENGTH]

CME Associates, Inc.

GROUND WATER OBSERVATION WELL REPORT

PROJECT: Brown Manufacturing Site
LOCATION: NYSDEC Project B-00024-7, Syracuse NY
CLIENT: C&H Engineers, P.C.
CONTRACTOR: CME Associates, Inc.
DRILLER: Al Linstruth INSPECTOR: Doug Hurlbut
INSTALLATION DATE July 28, 1998

FILE NO. 4663
WELL NO. MW-3
BORING NO. MW-3
LOCATION See Well Location Plan
SHEET 1 OF 1



SUMMARIZE SOIL CONDITIONS (NOT TO SCALE)

STICKUP ABOVE GROUND SURFACE OF CASING	Flush Mount Curb Box
ELEVATION STICKUP ~~ABOVE~~ Below GROUND SURFACE OF RISER PIPE.	-2"
THICKNESS OF SURFACE SEAL	6" 5000 psi Concrete 0.0' to 0.5'
TYPE OF SURFACE SEAL	Bentonite Chips 0.5' to 3.0'
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]	
TYPE OF CASING	12" Galvanized Steel
INSIDE DIAMETER OF CASING	8"
ELEVATION/DEPTH OF BOTTOM OF CASING	12"
INSIDE DIAMETER OF RISER PIPE	2" Sch. 40 PVC
TYPE OF BACKFILL AROUND RISER	none
DIAMETER OF BOREHOLE	8"
	Silica Sand 3.0' to 15.0'
ELEVATION/DEPTH OF BOTTOM OF RISER	4.0'
TYPE OF POINT OR MANUFACTURER	Sch. 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS	0.010"
DIAMETER OF WELLPOINT	2" I.D.
TYPE OF BACKFILL AROUND POINT	Morie #0 Silica
ELEVATION/DEPTH OF BOTTOM OF POINT	14.0'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	15.0'

[FIGURES REFER TO: EL. ____ DEPTH ____]

[____ ft. / LENGTH OF CASING L_3] [____ ft. / LENGTH OF RISER PIPE (L_1) + ____ ft. / LENGTH OF POINT (L_2) = ____ ft. / PAY LENGTH]

CME Associates, Inc.

GROUND WATER OBSERVATION WELL REPORT

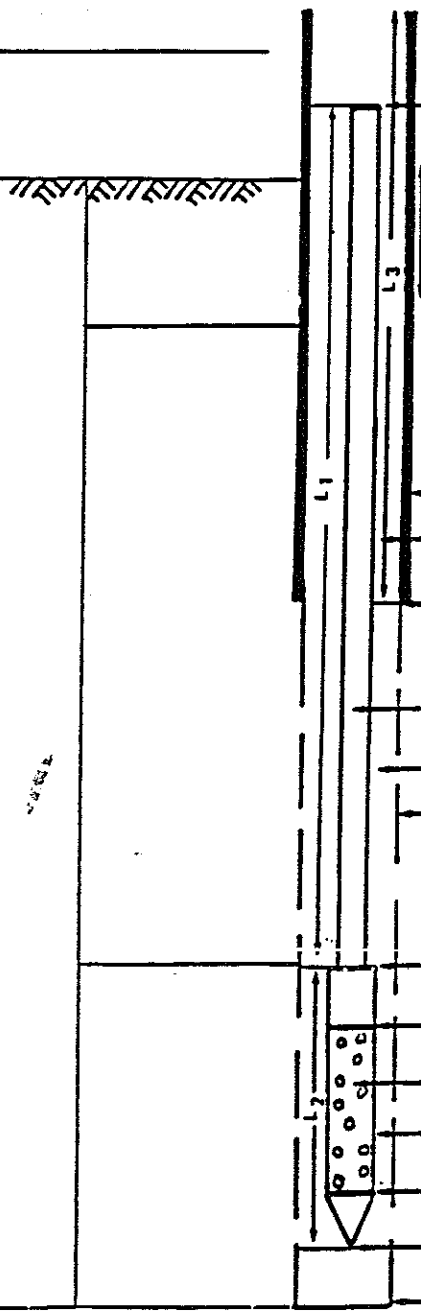
PROJECT: Brown Manufacturing Site
LOCATION: NYSDEC Project B-00024-7, Syracuse NY
CLIENT: C&H Engineers, P.C.
CONTRACTOR: CME Associates, Inc.
DRILLER: Al Linstruth INSPECTOR: Doug Hurlbut
INSTALLATION DATE July 29, 1998

FILE NO. 4663
WELL NO. MW-4
BORING NO. MW-4
LOCATION See Well Location Plan
SHEET 1 OF 1

SURVEY DATUM

GROUND ELEVATION

SUMMARIZE SOIL CONDITIONS (NOT TO SCALE)



GROUND SURFACE OF CASING	Flush Mount Curb Box
ELEVATION STICKUP ~~ABOVE~~ Below GROUND SURFACE OF RISER PIPE.	-2"
	6" 5000psi Concrete
THICKNESS OF SURFACE SEAL	0.0' to 0.5'
TYPE OF SURFACE SEAL	Bentonite Chips 0.5 to 3.0'
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]	
TYPE OF CASING	Galvanized Steel
INSIDE DIAMETER OF CASING	8"
ELEVATION / DEPTH OF BOTTOM OF CASING	12"
INSIDE DIAMETER OF RISER PIPE	2" Sch. 40 PVC
TYPE OF BACKFILL AROUND RISER	none
DIAMETER OF BOREHOLE	8"
	Silica Sand 3.0' to 15.0'
ELEVATION / DEPTH OF BOTTOM OF RISER	14.0'
TYPE OF POINT OR MANUFACTURER	Sch. 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS	0.010"
DIAMETER OF WELLPOINT	2" I.D.
TYPE OF BACKFILL AROUND POINT	Morie #0 Silica
ELEVATION / DEPTH OF BOTTOM OF POINT	14.0'
ELEVATION / DEPTH OF BOTTOM OF BOREHOLE	15.0'

[FIGURES REFER TO: EL. ____ DEPTH ____]

[ft. / LENGTH OF CASING L_3] [ft. / LENGTH OF RISER PIPE (L_1) + ft. / LENGTH OF POINT (L_2) = ft. / PAY LENGTH]

CME Associates, Inc.

GROUND WATER OBSERVATION WELL REPORT

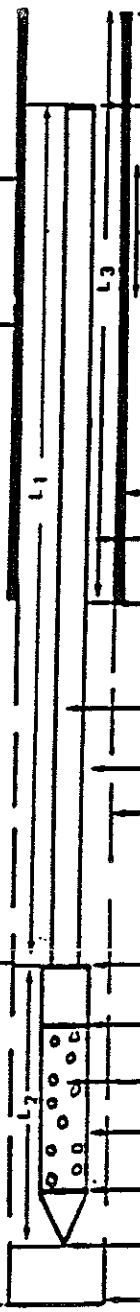
PROJECT: Brown Manufacturing Site
LOCATION: NYSDEC Project B-00024-7, Syracuse NY
CLIENT: C&H Engineers, P.C.
CONTRACTOR: CME Associates, Inc.
DRILLER: Al Linstruth INSPECTOR: Doug Hurlbut
INSTALLATION DATE

FILE NO. 4663
WELL NO. MW-5
BORING NO. MW-5
LOCATION See Well Location Plan
SHEET 1 OF 1

SURVEY DATUM

GROUND ELEVATION

SUMMARIZE SOIL CONDITIONS (NOT TO SCALE)



STICKUP ABOVE/BELOW GROUND SURFACE OF CASING: Flush Mount Curb Box

ELEVATION STICKUP ABOVE/BELOW GROUND SURFACE OF RISER PIPE: -2"

THICKNESS OF SURFACE SEAL: 6" 5000 PSI Concrete 0.0' to 0.5'

TYPE OF SURFACE SEAL: 2.5' Bentonite Chips 2.0 to 4.5'

[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]

TYPE OF CASING: Galvanized Steel

INSIDE DIAMETER OF CASING: 8"

ELEVATION/DEPTH OF BOTTOM OF CASING: 12"

INSIDE DIAMETER OF RISER PIPE: 2" Sch. 40 PVC

TYPE OF BACKFILL AROUND RISER: Soil Cuttings 0.5 to 2.0'

DIAMETER OF BOREHOLE: 8"

Silica Sand 4.5' to 20.0'

ELEVATION/DEPTH OF BOTTOM OF RISER: 5.5'

TYPE OF POINT OR MANUFACTURER: Sch. 40 PVC

SCREEN GAUGE OR SIZE OF OPENINGS: 0.010"

DIAMETER OF WELLPOINT: 2" I.D.

TYPE OF BACKFILL AROUND POINT: Morie #0 Silica

ELEVATION/DEPTH OF BOTTOM OF POINT: 15.5'

ELEVATION/DEPTH OF BOTTOM OF BOREHOLE: 20.0'

[FIGURES REFER TO: EL. ____ DEPTH ____]

[ft. / LENGTH OF CASING L_3] [ft. / LENGTH OF RISER PIPE (L_1) + ft. / LENGTH OF POINT (L_2) = ft. / PAY LENGTH]

APPENDIX E

EXCAVATION WORK PLAN (EWP)

E-1 NOTIFICATION

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

Table 1: Notifications*

Name	Contact Information
NYSDEC Project Manager Joshua Cook, P.E.	(315) 426-7411 joshua.cook@dec.ny.gov
NYSDEC Regional HW Engineer Harry Warner	315-426-7551 harry.warner@dec.ny.gov
NYSDEC Site Control Kelly Lewandowski	518-402-9553 kelly.lewandowski@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, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated 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, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;

- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix F of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

E-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 potentially contaminated material (remaining contamination). Soil screening will be performed during all excavation and invasive work below the demarcation layer performed during development, or for any reason, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section E-6 of this Appendix.

E-3 SOIL STAGING METHODS

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

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

Stockpiles of soil removed from below the demarcation layer (contaminated soil) will be placed on a plastic liner which will be bermed around the perimeter and constructed with a sump to contain water.

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.

E-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

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

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

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

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

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials. A log of materials transported from the site will be maintained by the QEP including hauler name, hauler permit number, truck license plate number, time departed site and destination.

E-5 MATERIALS TRANSPORT OFF-SITE

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

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

Truck transport routes are as follows: enter site via Bellevue Avenue and turn onto Chester Street. Leave site following Chester Street south to Hovey Street. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

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

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

E-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. 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. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

E-7 MATERIALS REUSE ON-SITE

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

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

E-8 FLUIDS MANAGEMENT

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

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

E-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RAWP. The existing cover system is comprised of a minimum of 24 inches of clean soil, and concrete covered sidewalks. The demarcation layer, consisting of orange geotextile will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

E-10 BACKFILL FROM OFF-SITE SOURCES

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

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

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils 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.

Backfill will be sampled to show that it meets the requirements of fill. Samples will be collected and analyzed as follows:

Table 5.4(e)10
Recommended Number of Soil Samples for Soil Imported To or Exported From a Site

Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

Unless it contains less than 10% by weight material which would pass through a size 80 sieve and consists of:

i. Gravel, rock, or stone, consisting of virgin material froma permitted mine or quarry; or

ii. Recycled concrete or brick from a DEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the New York State Department of Transportation *Standard Specifications Construction and Materials Volume 1 (2002).*

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. Documentation (e.g., bills-of -lading, weight tickets, etc.) showing all imported fill originated from an approved source must be included in the Periodic Review Report.

E-11 STORMWATER POLLUTION PREVENTION

All work at the site must be conducted in accordance with a Stormwater Pollution Prevention Plan, if required by the municipality and/or the State given the nature and extent of the project, which conforms to the requirements of the NYSDEC Division of Water guidelines, NYS regulations, City of Syracuse requirements, and Onondaga County requirements. The following minimum erosion controls will be employed for all on-site work.

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

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

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

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

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

All stockpiles will be managed in accordance with the minimum requirements described in Section E.3.

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.

E-12 EXCAVATION CONTINGENCY PLAN

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

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, 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 Periodic Review Report.

E-13 COMMUNITY AIR MONITORING PLAN

A generic Community Air Monitoring Plan (CAMP) in included in Appendix F of the SMP. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

E-14 ODOR CONTROL PLAN

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

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

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

E-15 DUST CONTROL PLAN

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

- Dust suppression will be achieved through the 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.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

E-16 OTHER NUISANCES

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

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

APPENDIX F

HEALTH AND SAFETY PLAN AND

COMMUNITY AIR MONITORING PLAN

Template Health and Safety Plan
Former Brown Manufacturing Site
Syracuse, New York

Prepared For:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

625 Broadway, 12th floor

Albany, NY 12233-7012

Prepared by:

PARSONS

301 Plainfield Road, Suite 350

Syracuse, NY 13212

January 2018

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LIST OF ACRONYMS

AED	Automated External Defibrillator
AHA	Activity Hazard Analysis
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
EMS	Emergency Medical Services
HAZWOPER	Hazardous Waste Operations and Emergency Response
IDLH	Immediately Dangerous to Life and Health
NAPL	Non-Aqueous Phase Liquid
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PID	Photo Ionization Detector
PPE	Personal Protective Equipment
PSM	Project Safety Manager
HASP	Health and Safety Plan
SSO	Site Safety Officer
TBD	To Be Determined
UV	Ultraviolet Radiation
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

This Health and Safety Plan (**HASP**) has been prepared for any post-remediation work at the Former Brown Manufacturing Site (hereinafter referred to as the "**Site**"). It provides guidance for office and field activities required to complete the scope of work. This plan is a template to be used to prepare a site-specific HASP by any future party performing work at the Site. This template provides guidance for potential hazards that may be encountered during field activities that may be required to complete any post-remedial activities. The primary post-remedial field activities may include, but are not limited to, the following:

- Future intrusive construction work; and
- Monitoring, inspection and maintenance of the groundwater monitoring wells installed at the Site.

During intrusive work and other field activities, field staff may be exposed to hazards associated with chemicals of concern on and off the Site. As a result, field personnel may be required to have specialized training (i.e. as per 29 CFR 1910.120) or wear personal protective equipment (**PPE**) suitable for the level of contaminates present. Air monitoring may be required to evaluate contamination levels, ambient air conditions, and to determine if additional PPE is necessary.

Field staff may also be exposed to other hazards that are encountered during field activities including slips, trips, falls, automobiles, traffic, heavy equipment, drill rigs, and winches. Depending upon the time of season, field staff may be exposed to biological hazards, for example insect bites and stings., and ticks. Meteorological hazards such as lightning, wind, rain, and ultraviolet radiation may also be present.

This HASP template outlines safety and health requirements and guidelines for project work. When implemented, these requirements will help protect site personnel, visitors, the public and environment from exposure to potential safety and health hazards.

This HASP must be updated as conditions change or situations change, usually by addenda to the plan. All field personnel must understand and implement the HASP and any addenda. Review of the HASP should be documented by having field personnel sign an acknowledgement form stating that they understand the plan and its requirements.

2.0 STATEMENT OF HEALTH & SAFETY POLICY

This Section will be updated with a statement of safety and health policy by the party performing the work prior to commencement of any intrusive field activities at the Site.

3.0 SCOPE OF WORK EVALUATION

This HASP Template accompanies the Site Management Plan (SMP) for the Site which has been investigated and assessed for restricted commercial use. This potential scope of work described in the SMP includes but is not limited to intrusive activities that may result in encountering residual contaminated soils as part of future redevelopment; Site cap inspections; and general Site inspections.

4.0 SITE BACKGROUND

The site is located in Syracuse, New York and occupies tax parcel 86-07-31 on the corner of Bellevue Avenue and Chester Street. The site encompasses an approximately 0.8-acre area.

5.0 SITE HISTORY

The site was formerly the location of the Brown Manufacturing Corporation, an automobile parts manufacturing facility, which operated from at least 1926 until approximately 1972 or 1973. In 1981, after reportedly being inactive for a number of years, the buildings on-site burned in a fire. Prior uses that appear to have led to site contamination include disposal of waste oil/sludge into a disposal pit and underground quenching trough. Following the fire, a remediation contractor reportedly removed and disposed of approximately 100 drums of waste oil contaminated by polychlorinated biphenyls (PCBs), the contents of the disposal pit and quenching trough, and a ruptured electrical transformer. Other sources of contamination include two underground storage tanks (UST) which were identified during the course of the remedial action, both of which contained petroleum which was consistent with fuel oil or diesel.

6.0 RESPONSIBILITY/IDENTIFICATION OF KEY LINE PERSONNEL

This section will be updated by the party performing the work prior to the commencement of such work.

Contractor:	TBD	
Address:	TBD	
Telephone:	TBD	Email: TBD

Company Executive responsible for project: TBD	Contact No. TBD
Manager/Superintendent: TBD	Contact No. TBD
Safety Representative/Manager: TBD	Contact No. TBD
Key Foreperson or forepersons: TBD	Contact No. TBD
Client Project Management POC: TBD	Contact No. TBD

These personnel have the authority and responsibility for implementing the provisions of this program for:

Project Site Location	On-site Contact No. TBD

All managers and supervisors are responsible for implementing and maintaining the site-specific HASP in their work areas and for answering worker questions about the HASP. A copy of this HASP must be available for review.

7.0 IDENTIFICATION OF COMPETENT/QUALIFIED PERSONS

The party performing the work and/or their subcontractors must identify OSHA-regulated and certified competent persons for work or tasks requiring that level of supervision. The field personnel listed below will be assigned to the project and have the designated certifications.

This section will be updated by the party performing the work prior to the commencement of work at the Site.

Name	Job Title	40-hr HAZWOPER	8-hr HAZWOPER Supervisor	8-hr HAZWOPER Refresher Expires	Other training (i.e. excavation, confined space)
TBD Field	Supervisor	-	-	-	

Prior to the commencement of any field activities, a competent person will be identified as the Field Supervisor and the person's certifications will be added to the HASP. The supervisor of the competent person must certify in writing the specific competencies of the named competent person.

8.0 HAZARD/RISK/EXPOSURE ASSESSMENT

A site-specific risk analysis must be conducted before commencing any investigation and remediation efforts at the site. An example of a site-specific risk review checklist is included as Exhibit 8.1, which must be modified by the Project Manager of the party performing work at the Site. This checklist documents existing exposures that may impact the work, surrounding facilities, equipment, workers, or the public at large. The analysis includes locating, documenting, and/or photographing items such as:

- Overhead and underground power lines;
- Sewer and water utilities;
- Underground fuel oil pipelines;
- Existing building interferences;
- Traffic;
- Security;
- Fences;
- Water hazards;

- Existing geographical and environmental conditions; and
- Investigation Derived Waste (**IDW**) Disposal.

Upon completion of the site-specific risk analysis, personnel must identify and control all work-related hazards and propose controls and mitigation strategies for high-risk activities.

Pre-field work safety activities include a detailed analysis of the scope of work and safety specifications. An example of elements that could be included in a pre-field work safety meeting is presented in Exhibit 8.2.

Exhibit 8.1 Site-Specific Risk Review Checklist

Date: Project or Location:

Risk/Hazard	Detail	Present?
Employee Exposure	Hazardous Chemicals	
	Overhead and underground utilities	
	Heavy equipment	
	Traffic	
	Airborne contaminants (dust, mists, fumes)	
	Other (specify):	
Hazardous Waste	Handling, removal or storage of hazardous	
Crane Work	Mobile cranes	
Drilling/ Sampling	Drill rig hazards	
	Grab Sampling	
Electrical	Staging area	
Personal Protective Equipment	Work activities or work site requires hearing protection	
	Work activities or location requires special protective clothing	
Public Exposure	Work activities or location requires special precautions to protect the public	
Permits	Required	
	Hot permit	
Other Exposures	Other exposure or high-risk activities (list):	

Exhibit 8.2 Pre-Field Work Safety Meeting

Notes: _____

_____

Reviewed by:_____ Title: _____ Date:_____

Date:	Project/Location:
Subcontractor Representative:	Project Manager (Party performing Work):
Phone:	Phone:
Subcontractor Safety Representative:	Safety Manager (Party performing Work):
Phone:	Phone:

The following items were identified and reviewed:

Health & Safety	
Site-Specific Safety Plans/Model Program	
Competent/Qualified Person Documentation	
Safety Audits/Inspections	
Subcontractor Responsibilities	
Site Orientation Requirements	
Pre-mobilization Safety Meeting/Date	
Crane Inspection Certification	
Personal Protective Equipment (PPE)	
Environmental Hazards	
Other:	
Medical	
Emergency Procedures	
Site Security	
Smoking Policy	
Medical Services Requirements	
Treatment Locations/Addresses/Phone	
Other	

Additional Notes/Comments:

_____

_____

_____

9.0 CONTROL MEASURES/ACTIVITY HAZARD ANALYSIS

9.1 CONTROL MEASURES

Site hazards and hazards resulting from investigation and remediation activities are controlled using one or more of the control measures listed below. The order of precedence is as follows:

9.1.1 Engineer/Design to Eliminate or Minimize Hazards

A major component of the design or planning phase is to select appropriate safety features to eliminate a hazard and render it fail-safe or provide redundancy using backup components.

Exclusion Zone

The exclusion zone will be established at the site for each intrusive activity. The zone will be defined by the excavation boundaries. In the field, the zone will be defined by temporary posts/stanchions and caution tape, extending from 10 feet up to the swing radius of the operating equipment in each direction around the intrusive activity. Unprotected onlookers should be located 50 feet upwind of intrusive activities. In the event that action levels are exceeded in the breathing zone, then all personnel in the exclusion zone must stop work, evacuate, evaluate the situation. If the actions levels continue to exceed recommended limits then upgrade the level of personal protective equipment on properly trained and certified crew members to continue work.

Decontamination Zone

A decontamination zone will be established between the exclusion zone and the support zone. This zone will also be delineated utilizing stanchions and caution tape, and will be up to 10 feet wide. Personnel decontamination must take place prior to leaving the decontamination area and prior to entering any personnel hygiene facilities, or before eating, drinking, or smoking. Any decontamination water will be contained for appropriate disposal. Soiled PPE will be removed and placed in drums.

Support Zone

A support zone will be established where break areas, operational direction and support facilities (to include supplies, equipment storage and maintenance areas) will be located. No equipment or personnel will be permitted to enter the support zone from the exclusion zone without passing through the personnel or equipment decontamination zone.

9.1.2 Guard the Hazard

Hazards that cannot be eliminated by design must be reduced to an acceptable risk level by safety guards or isolation devices that render them inactive.

9.1.3 Provide Warnings

Hazards that cannot be totally eliminated by design or guarding are controlled through using a warning or alarm device.

Exposure/Air Monitoring Program

An environmental and personal monitoring program will be developed based on site-specific information for any future intrusive activity. This plan discusses general information on wind direction monitoring, volatile organic compound (**VOC**) monitoring, and dust monitoring.

Wind Direction Monitoring

A wind direction indicator (such as survey flagging tied to a stake) will be erected at every active work site. This will enable the Site Safety Officer (**SSO**) and on-site personnel to determine upwind locations necessary for proper health and safety procedure implementation, (work areas relative to the excavation) and, if necessary, evacuation procedures.

Volatile Organics Monitoring

Field work at sites with VOC contamination shall use photoionization detector (**PID**) (OVM-580B/580S or equivalent) equipped with a 10.6e V lamp or other monitoring instrument deemed appropriate by the Project Safety Manager (PSM) to monitor VOC concentrations in the working area. Readings detected by the PID or other instrument will be used to determine the appropriate levels of protection. Action levels for some VOCs and particulates that have been previously encountered at the Site are presented in Table 9.1.

Dust Monitoring

If site activities generate sustained (15 minutes), visible dust due to wind erosion of soils, a personal DataRAM meter will be obtained to monitor worker breathing zones for total dust levels. Readings will consider upwind background dust levels, as well as diesel particulate emissions from heavy equipment before upgrades to higher levels of PPE are initiated as shown in Table 9.2.

Community Air Monitoring Plan

Community air monitoring will be conducted in compliance with the NYSDOH's Generic Community Air Monitoring Plan (**CAMP**) which is included as Attachment A. Real-time air monitoring for volatile compounds and particulates at the perimeter of the hot zone will be performed as described below.

VOC Monitoring

Periodic monitoring for VOCs will be conducted during non-intrusive activities such as the collection of soil samples. Periodic monitoring may include obtaining measurements upon

arrival at a location, when overturning soil, and upon leaving the location. In some instances, depending on the proximity of exposed individuals, continuous monitoring may be conducted during these activities.

Continuous monitoring for VOCs will be conducted during all ground intrusive activities (i.e., hand clearing and excavations). Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. VOCs will be monitored continuously at the downwind perimeter of the hot zone. Monitoring will be conducted in accordance with Table 9.1.

All 15-minute readings will be recorded and available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, will also be recorded.

Particulate Monitoring

Particulate concentrations will be monitored continuously at the downwind perimeter of the hot zone with a portable real-time particulate monitor capable of measuring particulate matter less than 10 micrometers in size and capable of integrating over a period of 15 minutes (or less). The equipment will include an audible alarm to indicate exceedence of the action level.

Upwind concentrations will be measured at the start of each workday and periodically thereafter in accordance with Table 9.1. All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review.

Calibrations

Field instruments will be calibrated immediately prior to each day's use. The calibration procedures will conform to manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer. Records of all instrument calibration and instrument manuals will be maintained on-site.

A battery check must be completed at the beginning and end of each working day.

9.1.4 Provide Special Procedures or Training

When design, guarding, or warnings cannot eliminate hazards, the party performing the work and their subcontractors must develop procedures, training, and audits to ensure safe completion of work. Training cannot be a substitute for hazard elimination when life threatening hazards are present.

Decontamination Procedure

Level D or Modified Level D protection will be worn for initial entry on-site and initially for all activities. If air concentrations exceed action levels, workers will employ engineering controls first before upgrading the level of protection. Personal decontamination may be necessary for activities involving the use of Modified Level D, Level C, or Level B PPE.

Table 9.2 includes the proper decontamination procedures that must be implemented if chemical contamination present and PPE protection greater than level D is used. The Project Safety Manager will determine the proper procedures for decontamination based on the work activities and amount of contamination.

Disposable wet towels will be provided in the decontamination zone for personnel hand/face washing.

Soil / Water / Waste Management

Procedures will be implemented regarding the management of soil, water, and waste to minimize the likelihood of unacceptable release of hazardous constituents. These procedures include:

- TBD
- TBD.

Provide Personal Protective Equipment

To protect workers from injury, the last method in the order of precedence is the use of personal protective equipment, such as hard hats, gloves, eye protection, and other protective equipment with the understanding that bulky, cumbersome, and heavy personal protective equipment is often discarded or not used, rendering this method ineffective without proper controls. If emergency eyewash stations are required, then they must be kept accessible at all times and be maintained to prevent from freezing. In the event that personal protective equipment is ripped or torn, work shall stop immediately and PPE shall be removed and replaced as soon as possible.

PPE Selection

The selection and use of PPE at individual sites will be initially Level D unless specified by the Project Safety Manager. The unknown nature of hazardous waste site work and the possibility of changing conditions during the work may require changes in the personal protective equipment. When changes in personal protective equipment become necessary, these changes shall be made in accordance with the action levels and criteria set forth in this plan. As a rule, levels of PPE will need to be reassessed if any of the following occur:

- Appearance of previously unidentified or anticipated chemical conditions or task hazards (this may require a HASP Addendum for the responsible party's review and acceptance prior to proceeding).
- Ambient weather conditions change which impact the use of assigned PPE.
- A new task is introduced or a previously assigned and evaluated task is expanded in scope.

If work tasks are added to the Scope of Work (**SOW**) after approval of this HASP, the Project Safety Manager shall identify and assess the task hazards, complete and sign an Activity Hazards Analysis (**AHA**) form and designate the level and type of PPE to be used during conduct of the task. The new AHA, along with any other additions, changes or modifications to the approved HASP shall be approved by the PSM and/or the Project Manager. Subsequently, these modifications, resulting in a HASP Addendum, shall be reviewed and accepted by the responsible party's representative prior to proceeding.

Initially at portions of the site, where NAPL may be encountered based on Site Investigation data, work will start in Modified Level D. In the remaining areas of the site, PPE level will be upgraded to Modified Level D, if NAPL is encountered. This includes tyvek coveralls, in addition to safety glasses with permanent side shields, steel toe boots, hearing protection (e.g. when working within 15 feet of vacuum excavation equipment, excavator, drill rig, sawing, or jack hammering), metatarsal foot protectors (when sawing, jack hammering, or pressure washing), long pants or jeans, traffic safety vests (when working on streets, sidewalks, parking lots, or driveways), , short or long sleeve shirts, nitrile outer and PVC inner gloves (required during all sampling activities), and hard hat (cannot be blue or white). Required equipment for Levels B, C, and D are detailed in Table 9.2, Description of Personal Protective

Equipment and Levels of Protection

The organic vapor monitor and dust monitor will be the primary instruments for determining contaminant concentrations that may trigger a change in respiratory protection during intrusive and sampling activities. Other instruments such as Draeger tubes, and/or other particulate air monitors may also trigger changes in PPE. Action levels for changes in personal protection equipment are shown in Table 9.1.

OSHA Requirements for Personal Protective Equipment

All personal protective equipment must meet the following OSHA standards:

Type of Protection	**Regulation**	**Source***
Eye and Face	29 CFR 1910.133 29 CFR 1926.102	ANSI Z87.1-1968
Respiratory	29 CFR 1910.134 29 CFR 1926.103	ANSI Z88.1-1980
Head	29 CFR 1910.135 29 CFR 1926.100	ANSI Z89.1-1969
Foot	29 CFR 1910.136 29 CFR 1926.96	ANSI Z41.1-1967

*ANSI = American National Standards Institute

Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.1025; 29 CFR 1910.134). In addition, if Level C protection is required, a cartridge change-out schedule must be

developed. HEPA filters will be the only cartridges used. Medical qualification, training and fit-testing must be received on an annual basis. If a respirator is worn more than 30 days per year, participation in a Medical Surveillance Program is required.

9.2 ACTIVITY HAZARD ANALYSIS

The party performing the work and their subcontractors are required to conduct an AHA for all aspects of the work. The activity hazards analyses consist of the following three steps:

- Identify the task and break it down into steps.
- Identify the hazards associated with each step.
- Identify the specific hazard control measure used for each step in accordance with the order-of-precedence method of control.

The U.S. Army Corp of Engineers wesite (www.swl.usace.mil/safety/asaindex.html) contains a library of sample AHAs that may be useful. The Project Managers may use the following list as a guide in determining the investigation and remediation activity hazards analyses for various high-hazard operations and critical tasks.

- **Pre-mobilization Inspection.** Conduct an initial site inspection for pre-job planning. The inspection should cover potential exposures such as the location of electrical lines, underground utilities, nearby structures, traffic conditions, site security needs, public exposures general liability, and other potential exposures.
- **Traffic Controls.** Control measures include warning signs, flagmen, traffic stoppage and control, and unloading procedures. Internal traffic control plans should include ways to restrict the number of vehicles on site, the flow of vehicles accessing the site and driving through the site, merging of site traffic with local vehicle traffic, pedestrian controls in traffic zones, access by emergency and rescue vehicles and operator controls.
- **Vehicle Operation.** Although driving a vehicle may be second nature to many individuals, there are many hazards and controls that need to be identified. Fatigue and distractions are two hazards that many individuals do not think about on a regular basis. **Field Activities.** Many different types of activities occur in the field from excavations, soil sampling, and monitoring. A variety of hazards could be incurred with each activity such as biological, slip/trips/falls and lacerations. An activity hazard analysis is required for each different field activity to identify the hazards and controls.
- **Field Visit.** When a field visit occurs, it may be before any field activities are taking place. However, there may still be hazards present such as walking or driving in fields with uneven terrain, etc. Although personal protective equipment such as a

hard hat and safety glasses may not be needed, sturdy work boots, long pants, and sunscreen may be necessary.

- **Mobilization/Demobilization.** Conduct an initial site inspection for pre-job planning. The inspection should cover potential exposures such as the location of electrical lines, underground utilities, nearby structures, traffic conditions, site security needs, public exposures general liability, and other potential exposures.

- **Heavy equipment controls.** Evaluate the use of heavy equipment in operations such as site clearing, grading, drilling and excavation or lifting. Controls should include equipment alarms, use of qualified operators, pre-use inspections, and any specific OSHA regulatory requirements.

- **Personal protective equipment (PPE).** Consider operations where PPE is required and the type of PPE required (e.g., eye, head, foot, respiratory, hearing and hand protection, and types of special protective clothing – Tyvek coveralls).

- **Portable hand and power tools.** Evaluate the tools to be used and the ways thatworkers are protected from the hazards associated with the use of tools. Consider tool maintenance requirements; electrical requirements; the use of ground fault circuit interrupters, grounding, extension cords, and tool inspection procedures; and employee training and PPE requirements.

- **Employee training.** Always review the safety training needs of employees. Training should include initial site safety orientations. Some operations (e.g.,HAZWOPER activities, excavation, confined space, and operating heavy equipment) may require special training that must be checked and evaluated.

Exhibit 9.1 is a sample activity hazards analysis form. Exhibit 9.2 shows a training record to be completed and kept on file for each activity hazards analysis. AHAs can be found in Attachment B. The intent of an AHA is to identify the steps, hazards, and control measures involved with performing a specific task. The attached AHAs are not inclusive of all activities that may be performed at the site, and may not include all of the steps, hazards or control measures required to safely complete a task. Any individual given a work assignment shall review the corresponding AHA prior to commencing work activities to determine whether the AHA needs to be modified for site specific conditions, or if an additional AHA should be developed.

Table 9.1 Regulatory Levels for Common Air Contaminants

Contaminant	OSHA PEL*	Monitoring Instrument	Action Level	Action Taken *(Refer to MSDSs for required actions and develop SOPs for required actions)*
Carbon Monoxide	50 ppm	4-gas meter, CO meter	>50 ppm	Refer to MSDS for required actions and develop SOPs for required actions.
Combustible Gas	10%	4-gas meter, LEL meter	>10%	Refer to MSDS for required actions and develop SOPs for required actions.
Dust#	5mg/m^3	DataRAM	<1 mg/m^3	None
			1-5 mg/m^3	Implement engineering controls to suppress or control dust.
			>5 mg/m^3	Continue dust suppression and stop work activities.
Oxygen	20.9%	4-gas meter, O2 meter	<19.5%	Refer to MSDS for required actions and develop SOPs for required actions
			19.5-23.5%	Normal.
			>23.5%	Refer to MSDS for required actions and develop SOPs for required actions
VOCs#	n/a	Photoionization Detector	< 1 ppm	None.
			1 - 5 ppm	Implement engineering controls to suppress vapor levels. Monitor for specific contaminants.
			6 - 10 ppm	Take 3 consecutive readings. If confirmed,wear half or full face piece respirator. Implement engineering controls to suppress vapor levels.
			11 - 50 ppm	Take 3 consecutive readings. If confirmed,wear full face piece respirator. Continue engineering controls to suppress mercury levels.
			> 50 ppm	Stop work activities. Take 3 consecutive readings to confirm. If trained and fit tested, don supplied air respirator.

Note: All readings that will be used to determine the appropriateness of an upgrade in PPE shall be taken in theworker's breathing zone. PID readings shall be sustained readings of 15 minutes or more. Multi-gas meter readings shall be 30 second sampling periods with the meter held in the worker's breathing zone. Readings will be taken at the beginning of the day, changes in work activities and during all sampling activities.

* The OSHA PEL levels are current as of December 2008. OSHA constantly reviews and updates these levels. The party performing the work shall review 29 CFR 1910.1000 Table Z-1 and update the levels, as necessary, prior to performing work.

The action levels and the actions taken for VOCs and for dust provided in this table are based on NYSDOH Generic Community Air Monitoring Plan (CAMP) (December 2002). The party performing the work shall review NYSDEC DER-10 to verify whether updates have been made to the Generic CAMP. For employee safety, OSHA regulation 1910 should be consulted.

Table 9.2 Description of Personal Protective Equipment and Levels of Protection

Level	Description	PPE
Level D	Level D protection will be worn for initial entry on-site and for all activities unless otherwise noted by the PSM.	– Standard work clothes; – Steel-toe safety boots; – Safety glasses (goggles must be worn when splash hazard is present); – Hearing protection (when working within 25 feet of vacuum excavation;equipment, excavators, drill rigs, sawing, or jack hammering); – Metatarsal foot protectors (when sawing, jack hammering, or pressure washing); – Traffic safety vests (when working on streets, sidewalks, parking lots, and driveways) – Nitrile outer gloves and latex or nitrile inner gloves (sampling operations); – Hard hat (must be worn during all site activities and cannot be blue or white); and –
Modified Level D	Modified Level D protection, unless otherwise specified by the PSM, will consist ofLevel D equipment and the following additional equipment:	– Nitrile outer gloves and latex or nitrile inner; – Tyvek coveralls if particulate hazards only are present; and poly-coated Tyvek overalls if liquid hazards are present.
Level C	Requirements for Level C protection is described in OSHA regulation 29 CFR 1910.134. Generally, Level C protection, unless otherwise specified by the SSO, will consist of Level D equipment and the following additional equipment:	– Full-face air-purifying respirator; – Combination HEPA filter (P100)/organic vapor cartridges; – Tyvek coveralls if particulate hazards only are present, poly-coated Tyvek coveralls if liquid hazards are present; and – PVC or nitrile inner and nitrile outer gloves.
Level B	Requirements for Level B protection is described in OSHA regulation 29 CFR 1910.134. If the concentration of volatile organics or cyanide equals or exceeds the specified action levels, all field personnel associated with the project will immediately retreat to a location up-wind of the source of contamination. At this point the SSO must consult with the responsible party to discuss appropriate actions.	

Exhibit 9.1 Activity Hazards Analysis Form

Page____ of _____

Project Name & Number:	**AHA No.**	**Date**	**New:**
Location:	**Contractor:**		**Revised:**
Required Personal Protective Equipment		**Analysis by:**	**Date:**
Superintendent/Competent Person		**Reviewed by:**	**Date:**
Work Operation:		**Approved by:**	**Date:**
Work Activity	**Potential Hazards**	**Preventive or Corrective Measures**	**Inspection Requirements**

Training Requirements: All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle.

Exhibit 9.2 Activity Hazards Analysis Training Record

JOB NUMBER _____
AHA NUMBER _____
JOB LOCATION _____
DATE: _____
NAME OF TRAINER: _____
SUBJECTS COVERED: _____

TRAINING AIDS USED: _____

ATTENDEES (PLEASE SIGN NAME LEGIBLY):

(Use additional sheets if necessary)

10.0 PERIODIC SAFETY INSPECTIONS/AUDITS

The PSM will implement an audit and inspection program. The Project Manager, PSM, or their designee, will conduct monthly safety inspections. The site inspection is a protocol designed to identify and correct unsafe acts and conditions, as well as recognize safe work practices and accomplishments in the party performing the work or their subcontractors' scope of work. The Project Manager or PSM should develop standard safety checklists appropriate to the work being performed. Exhibit 10.1 is an example of a simple checklist to evaluate a project's status, and should be modified to address potential unsafe acts and conditions specific to work activities occurring at the Site.

Inspections involve a daily or weekly site walk of a project site that focuses on safety. The Project Manager or Field Team Leader (**FTL**) responsible for the work conducts inspections, accompanied by the PSM as necessary. Daily site walks do not have to be documented, but once a week the Project Manager, or designee, prepares an inspection report and forwards it to the PSM for maintaining in the project file. Items found to be out of compliance must be assigned to the responsible party for corrective action and the corrective action tracked to completion.

Exhibit 10.1 Site Safety and Health Inspection Checklist

Project: _____ Date: _____
Name: _____ Time:_____

Any items that have been found deficient must be corrected before work or use.

This checklist includes, but is not limited to, the following:

Safe Access and Workspace		**Yes**	**No**
Are safe access and adequate space for movement available for:			
Emergencies			
Work area			
Walkways and passageways			
Are ladders, stairways, and elevators properly located and functioning?			
Is protection provided for floor and roof openings?			
Is overhead protection provided for all areas of exposure?			
Is lighting adequate?			
Planning Work for Safety			
Are employees provided with all required protective equipment?			
Have other contractors and trades been coordinated with to prevent congestion and avoid hazards?			
Is all temporary flooring, safety nets, and scaffolding provided where required?			
Utilities and Services Identification			
High voltage lines			
Have all been identified by signs?			
Have high voltage lines been moved or de-energized, or barriers erected to prevent employee contact?			
Sanitary Facilities			
Drinking water			
Are toilet facilities adequate?			
Work Procedures – Materials Handling			
Is material handling space adequate?			
Is material handling equipment adequate and proper?			
Is material handling equipment in good condition?			
Marine Safety			
Slip, trip, fall hazards	Muscle strain from improper lifting		
Heat or cold stress	Pinch points		
Insect bites	Inhaling, touching, ingesting contaminants		
Waves, surges, currents			
Noise exposure	Drowning		
Other (e.g., tunnels, excavations, shafts			

Comments:

_____

_____

11.0 COMPLIANCE REQUIREMENTS POLICY

The party performing the work and their subcontractors must enforce all applicable requirements of OSHA 1910 and 1926, where applicable. The party performing the work at the Site in the future and their subcontractors are individually responsible for training their respective employees and for complying with all project requirements. In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite (i.e. 4 minutes for activities that can be expected to result in an accident involving suffocation, severe bleeding, or other life threatening or permanently disabling injury or illness and 15 minutes for other types of injuries), which is available for the treatment of injured employees, a person who has a valid certificate in first-aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the worksite to render first aid. First-aid supplies must be accessible for immediate use and be of sufficient size and number to handle common first aid incidents.

The response time and distance to the nearest clinic, hospital or physician identified in Section 20 has been determined to be 3 minutes; however this may vary depending traffic. Since the response time for Emergency Medical Services (**EMS**) may be greater than four minutes if traffic conditions are not favorable, any future project at the Site that has the potential for an accident involving suffocation, severe bleeding, or other medical emergencies or permanently disabling injury or illness will require at least one individual at the work location have a valid certificate in CPR and first aid. Exhibit 11.1 represents OSHA regulations and requirements applicable to the project.

Exhibit 11.1 Competent Person and Activity Hazards Analysis Requirements

Safety and Health Requirement	OSHA Regulation	Competent Qualified Person-Supv	Training Required	Written Plan and AHA Required
General Safety & Health	1926.20			
Safety Training	1926.21			
First Aid and Medical	1926.23, 50			
Emergency Employee Action Plans	1926.35			
Hazard Communication	1926.59			
Hazardous Waste Operations and Emergency Response	1910.120; 1926.65			
Waste Disposal	1926.252			
Excavations	1926.650-652			

12.0 WRITTEN PROGRESSIVE DISCIPLINARY PROGRAM

Items found to be out of compliance must be assigned to the responsible party for corrective action and the corrective action tracked to completion. The project has a formal notice of subcontractor violation of safety and health regulations program to ensure that violations are issued in an immediately dangerous to life and health (**IDLH**) situation or when the subcontractor repeatedly fails to comply with safety and health requirements. Any noncompliance items must be advised to the responsible party using a Notice of Violation, included as Exhibit 12.1. The notice (Exhibit 12.1) documents poor performance and requires a response from subcontractor senior management. The notice contains five distinct levels of discipline, from submission of a recovery plan to contract termination.

Exhibit 12.1 Notice of Violation of Safety and Health Regulations

Date _____

Contractor Name _____

Address _____

_____

_____

Attention _____

This letter officially notifies you that you have been found to be in violation(s) of the following Safety Regulations:

_____

on (date): _____ by, _____

Confined Space Entry	____	Lockout/Tagout	____	Hot Work	_____	Personal Protective Equipment	____
Knowledge of the Environment	____	Awareness of Wanring Alarms	____	Evaculation Routes	_____	Back-up Alarms	____
Assembly Locations	____	Fall Protection	____	Scaffolding	_____	Environmental/Hazardous Material Storage	____
SafeWrok Practices	____	Security Practices	____				

Other: _____

_____

This/These violation(s) occurred at the following location(s): _____

_____

at the following time(s): _____ and date(s): _____

The name(s) of the employee(s) was/were: _____

under the supervision of: _____

13.0 HAZARD CORRECTION POLICY

Potential hazards that may be encountered during intrusive activities at the Site are listed below, but the list is not all-inclusive.

13.1 CHEMICAL HAZARDS

Health hazards and the exposure limits associated with potential chemicals of concern are presented in Table 13.1. These hazards can be encountered during subsurface and intrusive investigation in and around the Site. Both real time breathing zone air-monitoring and CAMP monitoring, using a photoionization detector, and a dust monitor should be performed by the responsible field investigator. The real time data will be recorded in the field book by the field investigator/SSO, following each observation, during intrusive activities and sampling activities. CAMP monitoring data will be downloaded daily and kept as an electronic file.

13.2 PHYSICAL HAZARDS

Physical hazards that may be encountered include but are not limited to heat stress, cold related illness, ultra-violet radiation, working on or adjacent to a waterway, and noise hazards.

13.2.1 Heat Stress:

Heat stress is one of the most common (and potentially serious) illnesses that affect field personnel. When site personnel are engaged in operations involving hot environments, a number of physiological responses can occur which may seriously affect the health and safety of the workers. Heat stress can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress can be eliminated or controlled through the use of a omprehensive heat stress prevention and monitoring program.

Training shall be provided to all employees to recognize heat illness hazards before starting to work outdoors. Any employee experiencing or witnessing signs and/or symptoms of a heat related illness shall report the findings to their supervisor immediately. Supervisors shall understand the procedures to follow when an employee exhibits symptoms consistent with heat illness, including emergency response.

13.2.2 Definitions

Acclimatization - a temporary adaption of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within 4-14 days of regular work for at least 2 hours per day in the heat.

Environmental Risk Factors - working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, and personal protective equipment worn by employees.

Table 13.1 Relevant Properties of Known or Suspected Volatiles and Semivolatiles

Compound (synonym)	OSHA PEL[(1)] (ppm)	IDLH (ppm)	LEL (%)	Odor Threshold[(2)] (ppm)	Odor Character	Vapor Pressue (mm Hg)	Pysical State	Detectible w/ 10.6 eV lamp PID (I.P. eV)
Hydrocarbons (PAH's)	[CA]							

(1) 29 CFR 1910, June 30, 1993 (8-hour Time weighted average unless otherwise specified.). These values may be modified by OSHA. The
values should be checked and updated, as necessary, prior to commencing work activities.
(2) ACGIH 1989 Highest reported value of acceptable odor threshold range. These values may be modified by ACGIH. The values should be
checked and updated, as necessary, prior to commencing work activities.
[IDLH] Immediately dangerous to life or health.
[CA] Suspected carcinogen - Minimize all possible exposures.
[STEL] 15 minute Short Term Exposure Limit
[SKIN] Designates that skin is an important possible route of exposure.
[CEIL] Ceiling Limit - not to de exceeded at any time during a work day.
[TLV] Threshold Limit Value.

Heat Illness - a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.

Heat Wave - a sudden and temporary rise of temperature above the seasonal average for a particular region, which lasts for a prolonged period of time. A heat wave can greatly increase the risk of heat related illnesses.

Personal Risk Factors - an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention or other physiological responses to heat.

Preventive Recovery Period - a period of time to recover from the heat in order to prevent heat illness.

Shade - blockage of direct sunlight. Canopies, umbrellas and other temporary structures or devices may be used to provide shade. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked sunlight. Shade is not adequate when heat in the area of shade defeats the purpose of shade, which is to allow the body to cool. For example, a car sitting in the sun does not provide acceptable shade to a person inside it, unless the car is running with air conditioning.

13.2.3 Signs and Symptoms of Heat Illnesses

Heat Rash – or prickly heat, occurs in hot and humid environments where sweat is notremoved from the skin. Usually disappears when worker returns to cool environment.

Heat Cramps – muscle contractions from the loss of fluids /electrolytes due to sweating. Occurs when workers perform hard physical labor in a hot environment. Most common in the arms and legs. Cramping can occur after work has stopped.

Heat Exhaustion – inadequate blood circulation from stress due to constant heat. The whole body, especially the circulatory system, is extremely stressed. Possible symptoms include: pale, flushed face and neck; clammy skin; heavy sweating; fatigue; shortness of breath; headache; dizziness or fainting; nausea and vomiting; and rapid heartbeat and breathing.

Heat Stroke – body's failure to regulate its' temperature. The most serious stage of heat illness. Symptoms include: dizziness and confusion, red, hot, dry skin; nausea and vomiting; very little sweating; rapid pulse; high body temperature, 105° F or higher; convulsions, and fainting.

13.2.4 Heat Illness Prevention

Prevention of heat related illness in extreme temperature project personnel shall consider implement a Physiological monitoring program, include monitoring with a WBGT and implementing work rest regiments. The field team shall be encouraged to drink plenty of liquids to replenish electrolytes. The field team shall also, construct a shaded rest area for workers to take breaks.

Prevention of heat related illness may call for establishing work teams to rotate to minimize heat related illnesses.

13.2.5 Heat Illness Treatment

Heat Cramps - take water every 15 to 20 minutes. Drinking an electrolyte replacement (like Gatorade) may help.

Heat exhaustion - Get medical help. Don't leave the person alone. While waiting, remove worker to cool place to rest; remove as much clothing as possible; give water and electrolytes; and don't allow person to get chilled.

Heat Stroke – Call 911 immediately. While awaiting medical help, get victim into cool area, fan vigorously, apply cool water to clothing or skin, and apply ice packs under arms and to the groin area.

13.2.6 Heat Waves

Heat illness prevention during heat waves means taking extra measures. More vigilance - supervisors/employees watch others very closely and provide more frequent feedback during work activities. Site workers shall avoid working alone and utilize the "Buddy System", watch each other and closely monitor/report an employees' condition. Personnel shall be accounted for their whereabouts throughout the work shift and at the end of the day.

More water - employees should drink small quantities of water more frequently before, during and after work. There should be extra supplies of water for replenishment, encourage employees to consult with their doctor on salt/mineral replacement.

More cooling - use other cooling measures in addition to shade, spraying body with water/wiping with wet towels and taking additional/longer breaks in the shade.

Change schedule - work activities may be started earlier on later in the evening, split-up work shifts and avoid working during the hotter parts of the day. Work shifts can be cut short or stop work.

Change meals - encourage employees to eat smaller/or more frequent meals (less body heat during digestion than with big meals), choose foods with higher water content (for example, fruits, vegetables and salads).

Acclimatization warning - personnel should allow the body time to adjust to sudden, abnormally high temperatures or other extreme conditions. Even employees previously fully acclimatized are at risk for heat illness.

13.2.7 Environmental and Physiological Factors

- Average ambient air temperature 96ºF (75-116ºF)
- Average humidity 29% (12% - 55%)
- Average wind speed 7 mph
- Average core body temperature 104ºF (98 -108ºF)

13.2.8 Provision of Water

Sufficient amounts of cool water shall be available and replenished at all times w/at least one quart per employee per hour for the entire shift. Easy access to clean and cool water shall be available to encourage frequent drinking.

13.2.9 Access to Shade

A Preventative Recovery Period (**PRP**) is necessary if an employee is suffering from heatillness or believes that a rest break is needed to recover from the heat. Access to shade shall be permitted at all times. Employees shall have access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than 5 minutes.

13.2.10 Measurement

Portable heat stress meters or monitors are used to measure heat conditions. These instruments can calculate both the indoor and outdoor WBGT Index according to established ACGIH Threshold Limit Value equations. With this information and information on the type of work being performed, heat stress meters can determine how long a person can safely work or remain in a particular hot environment.

13.2.11 Cold-Related Illness

Cold weather conditions can be hazardous to the safety and health of employees, endanger the stability of the body system, and cause conditions such as hypothermia and frostbite. It is vitally important that adequate precautions be taken to alleviate the effect of cold environments and to ensure that personnel can work safely and efficiently.

Prevent the deep body temperature from dropping below 36^0 C (96.8^0 F) and the core temperature from dropping below 35^0C (95^0F).

The following factors may contribute to a cold injury:

- Age
- Contact with wetness or metal
- Exposure to high winds
- Exposure to humidity
- General health
- Inadequate clothing

The following physical conditions worsen the effects of cold exposure:

- Allergies
- Excessive drinking
- Excessive smoking
- Specific drugs and medicines
- Vascular disease (e.g., Raynaud's phenomenon, acrocyanosis)

To monitor cold stress:

- At air temperatures below 20F (-10C) measure and record the wind chill index at least every 4 hours. The equivalent wind chill temperature and frostbite precautions will be determined using the Wind Chill Index (Table 13.2).

Table 13.2 Wind Chill Index

Estimated Wind Speed (mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Wind Speeds greater than 40 mph have little additional effect	LITTLE DANGER in < 1 hr with dry skin. Maximium danger of false sense of security.				INCREASING DANGER danger of freezing exposed flesh within 1 minute.			GREAT DANGER flesh may freeze within 30 seconds.				

- In outdoor workplaces, measure and record the wind speed at least every 4 hours when the rate of air movement exceeds 5 mph (2.2 meters per second)

- The wind chill index takes into account the wind velocity. If no anemometer is available, use the following to estimate wind speed:
  - 5 mph: light flag moves
  - 10 mph: light flag fully extended
  - 15 mph: raises newspaper sheet
  - 20 mph: causes blowing and drifting snow

To prevent cold stress:

- Use general or spot heating to increase temperature at the site.
- If work is being performed with bare hands for 10 or more minutes, to keep the worker's hands warm supply warm air jets, radiant heaters, or contact warm heaters.
- If the air velocity at the site is increased by the wind, draft, or ventilation equipment, shield the work area.
- At temperatures below 40^0F, cover metal handles of tools and control bars with thermal insulation.
- When necessary, substitute, isolate, relocate, or redesign equipment and processes to reduce cold stress.
- Use power tools, hoists, cranes, and lifting aids to reduce the metabolic work load.

- If work is performed continuously in an equivalent chill temperature of 30^0F or below, supply heated warming shelters such as tents, automobiles, or trucks and encourage workers to use them.

13.2.12 Electrocution

All drilling and excavation equipment will be kept a safe distance from live sources of electricity. Drill rods and other metal objects will not be raised above the height of the rig. The length of drill rods will be less than the distance to the nearest live electrical source so ifthe drill string is dropped it cannot fall across electrified equipment. All subsurface and overhead electrical sources and lines will be identified before digging, drilling, or sampling activities commence. Where possible and/or practical, electric lines and sources will be deactivated or insulated before digging, drilling, or sampling activities are commenced.

13.2.13 Ultraviolet Radiation

The sun emits ultraviolet radiation (**UV**) as heat and light. The skin's natural defense mechanisms attempt to reject the UV by distributing melanin pigmentation where needed. However, overexposure to direct sunlight can cause inflammation or blistering of the skin (sunburn). The use of sunscreen, long sleeve shirts, and wide brim hats can help prevent sunburn. Chronic exposure to UV radiation is known to cause skin cancer. In case of sunburn, do not apply burn ointment, cold cream, or butter to relieve pain. Use a dry dressing and get medical attention for severe, extensive sunburns.

13.2.14 Noise

Operating heavy equipment can be a potential noise source. Hearing protection will be worn by personnel operating heavy equipment, or other personnel in close proximity (e.g. 25 feet) to the equipment. If the noise level exceeds 85 decibels over an 8-hour time weighted average, then exposed personnel must be enrolled in a Hearing Conservation Program.

13.3 BIOLOGICAL HAZARDS

Biological hazards can result from encounters with mammals, insects, spiders, ticks, parasites, and pathogens. Mammals can bite or scratch when cornered or surprised. The bite or scratch can result in local infection or infection with systemic pathogens or parasites. Insect and spider bites can result in severe allergic reactions in sensitive individuals. Ticks carry a number of serious diseases. Dead animals, organic wastes, and contaminated soil and water can harbor parasites and pathogens. Most of the field activities will occur in a densely populated area; however, the possibility of encountering biological hazards still exists.

13.3.1 Ticks

Ticks may be common during the spring and summer. Two types of ticks may be encountered: the dog tick and the deer tick. The dog tick is the larger, more common tick. After biting, the dog tick will remain attached to the victim until engorged with blood. Dog ticks may transmit rocky mountain spotted fever and other diseases. The deer tick is much smaller, ranging

from poppy seed to grape seed size, and does not remain attached to the skin for very long after biting. Deer ticks can transmit Lyme disease, which can have serious, long-term health effects if left untreated. Lyme disease is characterized by a bulls-eye type rash; light in the center with an outer red area. Flu-like symptoms may also occur. These signs may occur at different times and the rash may not appear. If you discover any bites on the skin, wash the affected area and seek medical attention if a rash or flu-like symptoms appear.

13.3.2 Bees, Wasps, Hornets, and Other Insects

Symptoms of an insect bite are normally a sharp, immediate pain in the body part bitten. Poisonous insects and insect-like creatures that may be encountered at the Site include the following:

- Bees (honeybees, bumble bees, wasps, and hornets);
- Caterpillars; and
- Beetles/Bugs

13.3.3 Spiders:

The two poisonous spiders that may be encountered at the Site are the Brown Recluse and the Black Widow. The Brown Recluse is up to one inch long with a violin or "fiddle" shaped mark on the top of the head. The Black Widow is a smaller, bulbous black spider with a red hourglass-shaped mark on the underside.

Reactions to a Brown Recluse spider bite include mild to severe pain within two to eight hours and a star shaped area around the bite within three to four days. Significant tissue death and loss accompanies a Brown Recluse spider bite. Reactions to a Black Widow spider include intense pain at the site of the bite after approximately 15 to 60 minutes, followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils, and generalized swelling of face and extremities.

Persons that have been bitten by a Brown Recluse or Black Widow spider should be immediately transported to a hospital. The spider should be collected (if possible) for confirmation of the species.

13.3.4 Bloodborne Pathogens

Bloodborne pathogens include human immunodeficiency virus (**HIV**), hepatitis B virus (**HBV**), hepatitis C virus (**HCV**), and others. All occupational exposure to blood or other potentially infectious materials (**OPIM**) place workers at risk for infection with bloodborne pathogens. OSHA defines blood to mean human blood, human blood components, and products made from human blood. Other potentially infectious materials means: (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or

impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Understanding simple precautions can greatly minimize your chances of contracting a bloodborne disease. Practicing universal (standard) precautions refers to assuming that any and all blood or body fluids are contaminated and taking all safety measures to avoid transmission of a disease. Properly cover open cuts and skin abrasions. Never eat, drink, store food, smoke, handle contact lenses or apply cosmetics or lip balm in potential exposure areas. Wash hands and exposed skin immediately after an exposure incident, and after removing gloves. Utilize engineering controls to reduce exposure to bloodborne pathogens by removing, eliminating or isolating the hazard. Wear gloves, eye/face protection and mask when working with blood or a splash potential. Check gloves for tears, holes or punctures, and remove immediately when penetrated. Clean up spills and body fluids by carefully covering with a paper towel, gently pouring a 10% bleach solution over towels, and leaving it in place for 10 minutes. Use mechanical means, not your hands to pick up broken glass that is tainted with blood. Dispose of blood products, medical waste, gloves and equipment in properly labeled and approved biohazard containers. Clean wounds with soap and water. Flush eyes and mucous membranes with water or normal saline solution. Notify the site safety representative or your supervisor immediately and complete an incident report.

13.4 ENVIRONMENTAL HAZARDS

13.4.1 Slip, Trip, and Fall Hazards

Site workers may encounter slip, trip, and fall hazards due to uneven surfaces at sidewalk/pavement interfaces and obstructions protruding from the ground, such as:

- Holes, pits, tree roots, or ditches.
- Slippery surfaces.
- Steep grades.
- Uneven grades.
- Sharp objects, such as nails, metal shards, and broken glass.

13.4.2 Severe Weather Hazards

During the course of field operations, severe weather may be encountered, including thunderstorms, lightning, rainstorms, and other unsafe weather conditions (i.e., high winds and tornadoes). Criteria indicating that severe weather conditions may exist include:

- High winds (greater than 40 miles per hour – depending on the tree cover and other site specific conditions);

- Tornado watch or warning in place for the area including the site;
- Visible lightning;
- Extreme temperatures (e.g., greater than 100 degrees F); or
- Heavy rainfall that makes footing treacherous and visibility difficult.

If severe weather is approaching, the SSO and FTL will determine if weather conditions justify a stoppage of work activities. The SSO and FTL will also determine if weather conditions allow for restart of work activities following the severe weather. In general, work will not commence for 20 minutes after any lightning event. Monitor weather radio and if possible monitor weather radar via internet.

13.4.3 Fire Hazards

Although fires and explosions may arise spontaneously, they are more commonly the result of carelessness during the conduct of site activities, such as during refueling of heavy or hand held equipment. Some potential causes of explosions and fires include:

- Mixing of incompatible chemicals, which cause reactions that spontaneously ignite due to the production of both flammable vapors and heat;
- Ignition of explosive or flammable chemical gases or vapors by external ignition sources;
- Ignition of materials due to oxygen enrichment;
- Sudden release of materials under pressure.

13.5 SITE CHARACTERIZATION ACTIVITY HAZARD ANALYSIS

(To be updated as new task/activities are required.)

The party performing the work and their subcontractors are required to conduct an AHA for all aspects of the work. These AHAs will be reviewed daily. The activity hazards analyses consist of the following three steps:

- Identify the task and break it down into steps.
- Identify the hazards associated with each step.
- Identify the specific hazard control measure used for each step in accordance with the order-of-precedence method of control.

The Project Managers may use the following list as a guide in determining the investigation and remediation activity hazards analyses for various high-hazard operations and critical tasks.

- General Oversight
- Activities – Field. Many different types of activities occur in the field from excavations, groundwater sampling, soil sampling, well installation and monitoring,

and pump tests. A variety of hazards could be incurred with each activity such as biological, slip/trips/falls and lacerations. An activity hazard analysis is required for each different field activity to identify the hazards and controls.

- Site Visit or Site Walk. When a field visit occurs, it may be before any field activities are taking place. However, there may still be hazards present such as walking or driving in areas with uneven terrain, etc. Although personal protective equipment such as a hard hat and safety glasses may not be needed, sturdy work boots, long pants, and sunscreen may be necessary.
- Operation- Motor Vehicle. Although driving a vehicle may be second nature to many individuals, there are many hazards and controls that need to be identified. Fatigue and distractions are two hazards that many individuals do not think about on a regular basis. Operation- Heavy Equipment or Machinery and Drill rigs. Evaluate the use of heavy equipment in operations such as site clearing, grading, drilling and excavation or lifting. Controls should include equipment alarms, use of qualified operators, pre-use inspections, and any specific OSHA regulatory requirements.
- Fueling- Motor Vehicle
- Fueling- Heavy Equipment and Machinery
- Sampling- Soil
- Decontamination- Area Set-up
- Decontamination- Large Equipment
- Decontamination- Personnel. Following sample processing activities, personnel will decontaminate in the designated site decontamination area.
- Decontamination- Portable Tools. Equipment used to collect samples and to monitor personnel exposures shall be cleaned to remove any signs of the investigated material. Sample collection equipment may be sprayed with water to remove such material. Air monitoring or other sensitive equipment may be wiped with a damp disposable wipe.

14.0 TRAINING AND INSTRUCTION POLICY

All workers, including managers and supervisors, shall have training and instruction on general and job-specific safety and health practices. Training and instruction shall be provided as follows:

- When this HASP is updated for a specific activity;
- To all new workers;
- To all workers given new job assignments for which training has not previously provided;

- Whenever new substances, processes, procedures or equipment are introduced the workplace and represent a new hazard;
- Whenever the employer is made aware of a new or previously unrecognized hazard;
- To supervisors to familiarize them with the safety and health hazards to which workers under their immediate direction and control may be exposed; and,
- To all workers with respect to hazards specific to each employee's job assignment.

Workplace safety and health practices for all locations include, but are not limited to, the following:

- Explanation of this site-specific HASP, emergency action plan and fire prevention plan, and measures for reporting any unsafe conditions, work practices, injuries and when additional instruction is needed.
- Use of appropriate clothing, including gloves, footwear, and personal protective equipment.
- Information about chemical hazards to which employees could be exposed and other hazard communication program information.
- Availability of toilet, hand-washing, and drinking water facilities.
- Provisions for medical services and first aid including emergency procedures.

In addition, specific instructions to all workers will be provided regarding hazards unique to their job assignment, to the extent that such information was not already covered in other training. All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120, including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher training.

15.0 PROJECT SITE EMPLOYEES ORIENTATION PROGRAM SUBJECTS

The PSM helps to develop the orientation and meets with new workers to review site procedures and requirements. Topics covered in the HASP overview include:

- Names of personnel responsible for site safety and health
- Reporting emergencies, incidents and unsafe conditions
- Emergency/evacuation plans
- Safety, health and other hazards at the site
- Review of relevant activities on site and related AHAs
- Proper use of personal protective equipment

- Work practices by which a worker can minimize risk from hazards
- Safe use of engineering controls and equipment on site
- Acute effects of compounds at the site
- Decontamination procedures

16.0 EMPLOYEE COMMUNICATION SYSTEM AND POLICY

An open, two-way communication between management and staff on health and safety issues is essential to an injury-free, productive workplace. The following system of communication is designed to facilitate a continuous flow of safety and health information between management and staff in a form that is readily understandable and consists of one or more of the following checked items:

- New worker orientation including a discussion of safety and health policies and procedures.
- Review of site-specific HASP prepared by future party performing work at the Site.
- Workplace safety and health training programs.
- Regular weekly and daily safety meetings.
- Effective communication of safety and health concerns between workers and supervisors, including translation where appropriate.
- Posted or distributed safety information.
- A system for workers to anonymously inform management about workplace hazards.
- A labor/management safety and health committee that meets regularly, prepares written records of the safety and health committees meetings, reviews results of the periodic scheduled inspections, reviews investigations of accidents and exposures and makes suggestions to management for the prevention of future incidents, reviews investigationsof alleged hazardous conditions, and submits recommendations to assist in the evaluation of employee safety suggestion.

17.0 RECORDKEEPING POLICY

Following steps must be taken to document implementation of the site-specific HASP:

- Records of hazard assessment inspections, including the persons conducting the inspection, the unsafe conditions and work practices that have been identified and the action taken to correct the identified unsafe conditions and work practices, are recorded on a hazard assessment and correction form.
- Documentation of safety and health training for each worker, including the worker's name or other identifier, training dates, types of training, and training providers are recorded on a worker training and instruction form.

- Other records are retained as required by contract specifications or by local, state or federal (OSHA regulations). Where regulations do not specify the length of records retention, a period of three years after project completion will be used.

18.0 INCIDENT/NEAR-MISS INCIDENT INVESTIGATIONS POLICY

All incidents and significant near-miss incidents are investigated by an individual or team with training in accident investigation and root cause analysis. The party performing the work and their subcontractors must investigate incidents involving their employees or activities and maintain an investigation report.

Procedures for investigating workplace incidents and near-miss incidents include:

- Responding to the incident scene as soon as possible;
- Reporting incidents and near-miss incidents immediately to the appropriate point-of contact
- Interviewing injured workers and witnesses;
- Examining the workplace for factors associated with the incident/near-miss incident;
- Determining the cause of the incident/near-miss incident;
- Taking corrective action to prevent the incident/near-miss incident from reoccurring;
- Recording the findings and corrective actions taken; and
- Post-accident substance abuse testing.

19.0 EMERGENCY ACTION PLAN

The purpose of the Emergency Action Plan is to ensure that immediate mitigative and corrective emergency response actions are in place to minimize the consequences of an emergency, protect worker and public health and safety, provide security, and ensure the continuance of such actions until the emergency is terminated. Development and implementation of an Emergency Action Plan is required for prompt, efficient, and effective response to emergencies in accordance with applicable local, staff, and federal regulations.

The Project Manager will ensure that a comprehensive Emergency Action Plan has been established prior to any work involving any radiological or chemical hazard. The Emergency Action Plan is needed to train personnel on the required actions during an emergency situation to preserve the health and safety of the public and workers.

An Emergency Action Plan shall be developed and implemented in accordance with the applicable standards or requirements and specific site conditions. The basic elements of the Plan are as follows:

- Identification of hazards and threats, hazard mitigation, development and preparation of emergency plans and procedures, and identification of personnel and resources needed for effective response.
- Actions taken following termination of the emergency to return to normal operations.
- Assessments and documentation to ensure that stated emergency capabilities are sufficient to implement emergency plans.

20.0 SITE SPECIFIC MEDICAL EMERGENCY PLAN

Following medical requirements have been established and implemented for the project:

20.1 NON-EMERGENCY MEDICAL SERVICES

The following medical facilities are suggested based on their proximity to the Site to treat work-related injuries and illnesses that are NOT life threatening. It is recommended to contact the clinics to ensure that the hours of operations meet the potential needs of Site workers. If work hours are outside the hours of operation of these clinics, then additional clinics that have better hours must be identified.

Non-Emergency Medical Services

Fiver Start Urgent Care Fairmount, 3504 W Genesee St., Syracuse, NY 13219, Phone (315) 350-3305

Emergency Medical Services

Upstate Medical Center Emergency Room, 750 E. Adams St., Syracuse, NY 13210, Phone (315) 464-5611 (Figure 20.1).

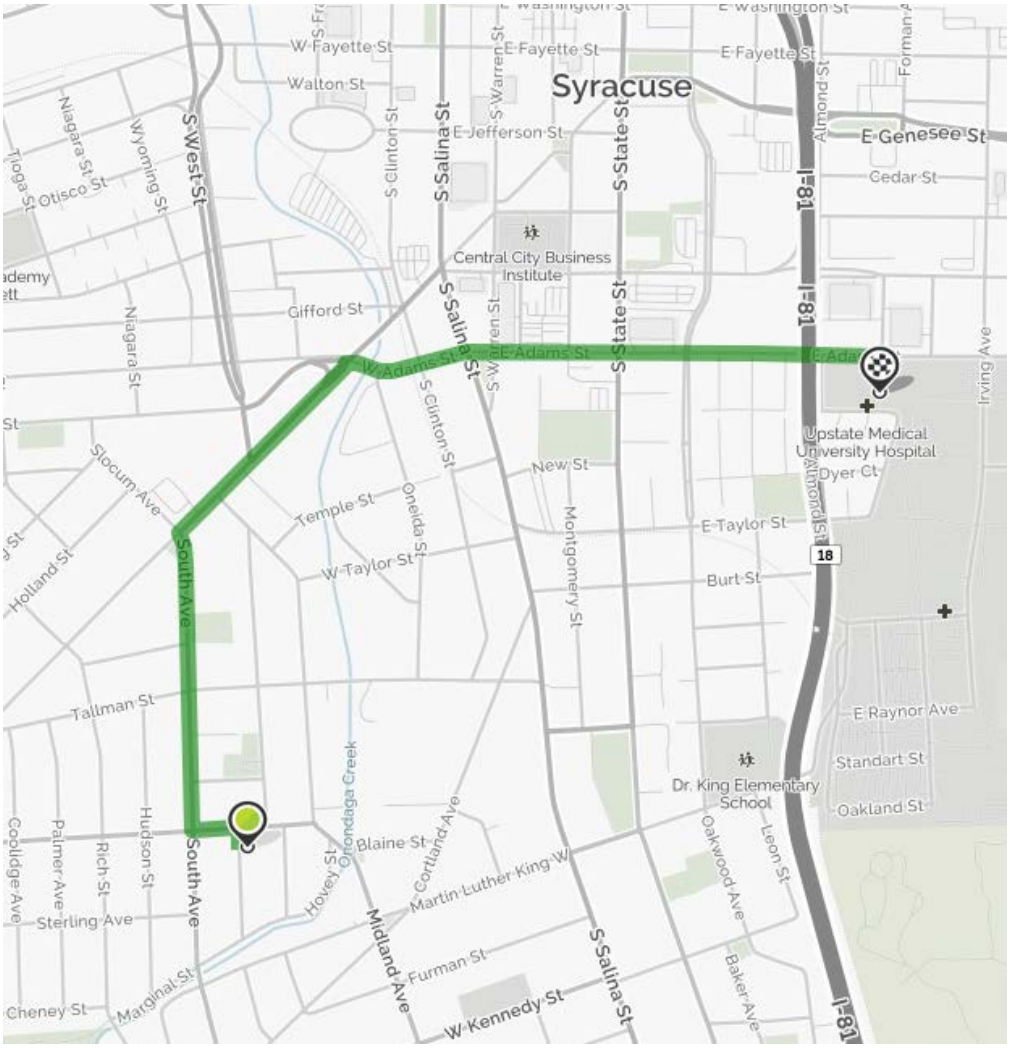
Note: Transportation to a medical facility for non-emergencies must be done by at least two (2) individuals (i.e. driver and observer).

Figure 20.1 Upstate Medical Center Emergency Room

750 E. Adams St.

Syracuse, NY 13210

(315) 464-5611



Directions:

1. **Start out going NORHT on CHESTER ST. toward BELLEVUE AVE.**
2. **Turn LEFT onto BELLEVUE AVE.**
3. **Turn RIGHT onto SOUTH AVE.**
4. **Turn RIGHT onto W. ONONDAGA ST.**
5. **Turn RIGHT onto W. ADAMS ST.**
6. **End at 750 E. ADAMS ST., SYRACUSE, NY 13210**

Total Est. Time: 5 minutes **Total Est. Distance: 1.5 miles**

20.2 EMERGENCY MEDICAL RESPONSE

The project shall display posters/signs with emergency telephone numbers and locations of facilities in visible locations and at selected phone locations throughout the project area (including subcontractor facilities).

Emergency Contacts	**Phone Number**
Ambulance	**911**
Fire Department	**911**
State Police (NYS)	**911**
Pollution Toxic Chemical Oil Spills	(800) 424-8802
Upstate Medical Center Emergency Room	(315) 464-5611
Poison Control Center	(800) 222-1222

21.0 HAZARD COMMUNICATION PROGRAM

The purpose of a Hazard Communication Program is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training. This section will provide the Program outline, a list of the hazardous chemicals to be used and a description of where Material Safety Data Sheets (**MSDSs**) will be located.

ATTACHMENT A

NYSDOH GENERIC COMMUNITY AIR MOITORING PLAN (CAMP)

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX G

FIELD SAMPLING PLAN

Field Sampling Plan (FSP)
Former Brown Manufacturing Site
Syracuse, New York

Prepared For:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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January 2018

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SECTION 1

INTRODUCTION

This Field Sampling Plan (FSP) defines the methods and procedures to be used for conducting site monitoring at the Former Brown Manufacturing Site in Syracuse, New York.

1.1 OVERVIEW OF FIELD ACTIVITIES

The following field activities will be performed as part of the long term site management work:

- **Site Use Inspection** – The site usage will be inspected to determine if it is compliant with the environmental easement.
- **Cover System Inspection** – The Site cover system will be inspected annually, including the asphalt surfaces and the exposed concrete slabs.
- **Groundwater Monitoring** – Groundwater samples will be collected from the monitoring network to assess natural attenuation of contamination.

SECTION 2

GENERAL FIELD GUIDELINES

2.1 SITE HAZARDS

Potential on-site surface hazards, such as sharp objects, traffic, and building hazards will be identified prior to initiation of fieldwork.

2.2 FIELD LOG BOOKS AND SAMPLE/INSPECTION LOGS

All field activities will be carefully documented in field log books and on field sample/inspection logs. Entries will be of sufficient detail that a complete daily record of significant events, observations, and measurements is obtained.

The field log book will provide a legal record of the activities conducted at the site. Accordingly:

- Field books will be bound with consecutively numbered pages.
- Field books will be controlled by the Field Team Leader while field work is in progress.
- Entries will be written with waterproof ink.
- Entries will be signed and dated at the conclusion of each day of fieldwork.
- Erroneous entries made while fieldwork is in progress will be corrected by the person that made the entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing the correction.
- Corrections made after departing the field will be made by the person who made the original entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing and dating the time of the correction.

At a minimum, the log book and sample/inspection logs will include the following information:

- Location of sample/inspection activity;
- Date and time of sampling/inspection;
- Names and titles of field team members;
- Names and titles of any site visitors and site contacts;
- Weather information, for example: temperature, cloud coverage, wind speed and direction;
- Purpose of field activity;
- A description of the field work conducted;
- Sample media (groundwater, etc.);
- Sample collection method;
- Number and volume of sample(s) taken;

- Description of sampling point(s);
- Volume of groundwater removed before sampling;
- Preservatives used;
- Analytical parameters;
- Date and time of collection;
- Sample identification number(s);
- Sample distribution (e.g., laboratory);
- Field observations;
- Any field measurements made, such as pH, temperature, conductivity, water level, etc.;
- References for all maps and photographs of the sampling site(s);
- Information pertaining to sample documentation such as:
  - Bottle lot numbers;
  - Dates and method of sample shipments; and
  - Chain-of-Custody Record and Federal Express Air Bill numbers.

SECTION 3

FIELD EQUIPMENT DECONTAMINATION AND MANAGEMENT OF INVESTIGATION DERIVED WASTES

3.1 DECONTAMINATION AREA

It is anticipated that most groundwater sampling will be completed using dedicated sampling equipment. If non-dedicated equipment is used, decontamination procedures are outlined below.

3.2 SAMPLING EQUIPMENT DECONTAMINATION

Suggested Materials:

- Potable water
- Phosphate-free detergent
- Distilled water
- Aluminum foil
- Plastic/polyethylene sheeting
- Plastic buckets and brushes
- Personal protective equipment in accordance with the Project Safety Plan

Procedures:

- Prior to sampling, all non-dedicated sampling equipment (downhole sample pumps, interface probes, etc.) will be either steam cleaned or washed with potable water and a phosphate-free detergent. Decontamination may take place at the sampling location as long as all liquids are contained in pails, buckets, etc.
- The sampling equipment will then be rinsed with potable water followed by a deionized 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 be wrapped in polyethylene plastic or aluminum foil for storage or transportation from the designated decontamination area to the sampling location.

3.3 MANAGEMENT OF INVESTIGATION DERIVED WASTES

3.3.1 Decontamination Fluids

Decontamination fluids will be collected in DOT approved 55-gallon drums. The drums will be labeled as investigation derived wastewater.

3.3.2 Purge Water

All purge water will be contained in 55-gallon drums. The drums will be labeled as investigation derived wastewater from the corresponding well.

3.3.3 Personal Protective Equipment

All personal protective equipment (PPE) will be placed in 55-gallon drums or roll-off containers for proper disposal.

3.3.4 Dedicated Sampling Equipment

All dedicated groundwater sampling equipment (dedicated disposable polyethylene bailer and dedicated polypropylene line) will be placed in 55-gallon drums for disposal.

SECTION 4

ANNUAL SITE INSPECTION

4.1 INTRODUCTION

The Site cover system will be inspected annually, including the concrete sidewalk. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Unscheduled inspections may take place when a breach in the cover system has been reported or an emergency occurs that is deemed likely to affect the integrity of the system, such as flooding.

4.1.1 Cover System Inspections

The following will be used for inspection of the cover system.

4.1.2 Suggested Equipment and Supplies

- Field book
- Site figures
- Measuring tape or wheel
- Camera

4.1.3 Inspections

- Defects in the cover system (erosion, holes, burrows, subsidence, etc.) or concrete sidewalk (e.g. cracks, holes, etc) will be noted on the inspection form provided as Figure 4.1
- Defects will be photographed and a photo log and description will be recorded in the field book or on the inspection form.
- Inspection to ensure that site use is consistent with the Environmental Easement.
- Note location of any observed defects on the site figure. If possible measure the location of the defect from nearest landmark (i.e., building corner) and record in the field book or on the site figure.

FIGURE 4.1
COVER SYSTEM INSPECTION FORM
FORMER BROWN MANUFACTURING SITE

Inspector: _____ Date: _____

Event Type (circle one): Scheduled / Non-Routine

Site Use Inspection

Is site use consistent with Environmental Easement?

Sidewalk Inspection

Please note any observations of breaches in any concrete/sidewalks, which may include but are not limited to cracks, holes, indentations, vegetation growing through concrete etc.

Soil Inspection

Please note any observations of breaches in the soil cover, which may include but are not limited to holes and soil washout. Include a sketch identifying the location of defects. Is there evidence of any excavations? Describe and include a sketch of areas of disturbance.

SECTION 5

GROUNDWATER SAMPLING PROCEDURES

5.1 INTRODUCTION

Procedures for obtaining groundwater samples are described in this section. Sample handling procedures are described in Section 8.

5.2 GROUNDWATER SAMPLING

The following method will be used to collect groundwater samples from monitoring wells.

5.2.1 Suggested Equipment and Supplies

- Field book
- Project plans
- Personal protective equipment in accordance with the HASP
- Oil/Water Interface Probe
- Temp, conductivity, pH meters
- Turbidity meter
- 250-mL glass beaker
- Decontamination supplies
- Peristaltic or other low-flow purge pump
- Plastic tubing
- Plastic sheeting
- PID
- Clear tape, duct tape
- Coolers and ice
- Laboratory sample bottles
- Federal Express labels

5.2.2 Groundwater Sampling Method

Purging

- The number and frequency of groundwater samples to be collected and the associated analytical parameters are summarized in the SMP.
- Prior to sampling, the static water level and thickness of any free product will be measured to the nearest 0.01 foot from the surveyed well elevation mark on the top of the PVC casing with a decontaminated oil/water interface probe. The measurement will be recorded in the field book.
- The probe will be decontaminated according to procedures outlined in Section 3.

- Each well will be purged using a submersible pump and low-flow purging techniques to stabilize the following water quality parameters maintaining a drawdown of less than 0.3 feet: temperature, conductivity, pH, dissolved oxygen, oxidation reduction potential (ORP), and turbidity; which will be measured after one flow-through cell volume has been purged or after five minutes have passed, whichever is greater. Stabilization is defined as three consecutive measurements within: 10% for turbidity, unless turbidity is less than 5 NTU; 10% for DO, unless DO is less than 0.5 mg/L; 3% for specific conductance; 3% for temperature; +/- 0.1 standard units for pH; and +/- 10 mV for ORP.
- If a well goes dry before the required volumes are removed, it will be allowed to recover, purged a second time until dry or the required volumes are removed, and sampled when it recovers sufficiently. If field conditions (based on geology observed during drilling) indicate that water level recovery may be slow, then slow purging will be conducted. If the well goes dry during slow purging, it will be allowed to recover, and then sampled without a second purge.
- Purge water will be managed and disposed of in accordance with procedures described in Section 3.

Sampling

- Once stabilization was achieved, groundwater samples were collected using a low-flow submersible pump with dedicated tubing.
- Prior to filling the sample bottles, one "clean" container will be filled with water. The temperature, pH, and conductivity will be measured with a pre-calibrated probe and recorded in the field book.
- Sample containers for VOCs will be filled first. Sample containers for the other analytes will follow. If turbidity is less than 50 NTU, the sample for metals analysis will not be filtered. If turbidity is greater than 50 NTU, one filtered and one unfiltered sample for metals analysis will be collected and placed in bottles provided by the laboratory.
- The sample containers will be labeled, placed in a laboratory-supplied cooler and packed on ice (to maintain a temperature of 4^{o} C). The cooler will be shipped overnight or delivered to the laboratory for analysis.
- Chain-of-custody procedures will be followed as outlined in the QAPP.
- After all samples are collected, dedicated sampling equipment will be disposed of in accordance with methods described in Section 3.3.
- Well sampling data will be recorded in the field log book and on the Groundwater Sampling Record shown in Figure 5.1, or similar form.

Figure 5.1 Groundwater Sampling Record

GROUNDWATER SAMPLING RECORD

SITE NAME: _____
PROJECT NUMBER: _____

SAMPLE NUMBER: _____ WEATHER: _____
DATE: _____ TIME: _____

SAMPLERS: _____ of _____
_____ of _____

DESCRIPTION OF SAMPLING POINT

Sample Location: Monitoring well MW- _____
Screen/Sample Depth: _____
Sampling Method: _____

GROUNDWATER PURGING

Initial Static Water Level: _____
One Well Volume: 3 Volumes

2-Inch Casing:	_____	Feet of Water x 0.16 Gallons/Foot =	_____	Gallons	_____
3-Inch Casing:	_____	Feet of Water x 0.36 Gallons/Foot =	_____	Gallons	_____
4-Inch Casing:	_____	Feet of Water x 0.65 Gallons/Foot =	_____	Gallons	_____

Volume of groundwater purged: _____ Gallons
Purging Device: _____
Purge Water Disposition (e.g., contained): _____

SAMPLE DESCRIPTION

Color: _____
Odor: _____
Other: _____
Sample Analyzed for: _____
QC Samples at this Location: _____
QC Samples Analyzed for: _____

FIELD MEASUREMENTS

Temperature (C/F): _____ Dissolved Oxygen: _____
pH: _____ Eh (Redox Potential): _____
Conductivity (µohms/cm): _____
Turbidity (NTU): _____

SAMPLE CUSTODY

Chain of Custody Number: _____ Laboratory: _____
Shipped Via: _____ Airbill Number: _____

COMMENTS _____
_____

SECTION 6

FIELD INSTRUMENTS AND CALIBRATION

Field analytical equipment will be calibrated immediately prior to each day's use and more frequently if required. The calibration procedures will conform to manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. All instrument calibrations will be documented in the project field book and in an instrument calibration log. Records of all instrument calibration will be maintained by the Field Team Leader and will be subject to audit by the Project Quality Assurance Manager (PQAM). Copies of all of the instrument manuals and/or instruction sheets will be maintained on-site by the Field Team Leader.

The following field instruments will be used during the investigation:

- PID,
- pH Meter,
- Specific Conductivity Meter and Temperature Probe, and
- Turbidity Meter.

6.1 PORTABLE PHOTOIONIZATION DETECTOR

- The photoionization detector (PID) will be a RaeSystems MiniRae 2000 (or equivalent), equipped with a 10.6 eV lamp. The MiniRae is capable of ionizing and detecting compounds with an ionization potential of less than 10.6 eV. This accounts for up to 73% of the volatile organic compounds on the Target Compound List.
- Calibration must be performed at the beginning of each day of use with a standard calibration gas having an approximate concentration of 100 parts per million of isobutylene. If the unit experiences abnormal perturbation or erratic readings, additional calibration will be required.
- All calibration data must be recorded in the field logbook.
- A battery check must be completed at the beginning and end of each working day.

6.2 PH METER

- Calibration of the pH meter must be performed at the start of each day of use, and after very high or low readings as required by this plan, according to manufacturer's instructions.
- National Institute of Standards and Technology - traceable standard buffer solutions which bracket the expected pH range will be used. The standards will be pH of 4.0, 7.0 and 10.0 standard units.
- The pH calibration must be used to set the meter to display the value of the standard being checked.

- The calibration data must be recorded on calibration sheets maintained on-site or with the piece of equipment.

6.3 SPECIFIC CONDUCTIVITY METER AND TEMPERATURE PROBE

- Calibration checks using the conductivity standard must be performed at the start of each day of use, after five to ten readings or after very high or low readings as required by this plan, according to manufacturer's instructions.
- The portable conductivity meter must be calibrated using a reference solution of 200 uohms/cm on a daily basis. Readings must be within five percent to be acceptable.
- The thermometer of the meter must be calibrated against the field thermometer on a weekly basis.

6.4 TURBIDITY METER

- The turbidity meter must be checked at the start of each day of use and at the end of the day, according to manufacturer's instructions.

SECTION 7

FIELD SAMPLE IDENTIFICATION AND CUSTODY

7.1 SAMPLE IDENTIFICATION

Each sample will be given a unique alphanumeric identifier in accordance with the following classification system:

SAMPLE IDENTIFICATION

LL*	NN*	N-N	LL
Sample Type	Sample Number	Depth Code	QC Identifier

Water

Sample Type: MW - Monitoring Well

Sample Number: Number referenced to a sample location map.

QC Identifier:

FB - Field Blank	MS - Matrix Spike
TB - Trip Blank	MD - Matrix Spike Duplicate
WB - Wash or Rinse Blank	MB - Matrix Blank

* L = Letter

* N = Number

Field duplicate samples will be assigned identifiers that do not allow the laboratory to distinguish them as field duplicates. Each sample container will be labeled prior to packing for shipment. The sample identifier, site name, date and time of sampling, and analytical parameters will be written on the label in waterproof ink and recorded in the field book.

7.2 CHAIN OF CUSTODY

- A Chain-of-Custody (COC) record (Figure 7.1 or similar) will accompany the sample containers during selection and preparation at the laboratory, during shipment to the field, and during return shipment to the laboratory.
- The COC will identify each sample container and the analytical parameters for each, and will list the field personnel that collected the samples, the project name and number, the name of the analytical laboratory that will receive the samples, and the method of sample shipment.
- If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample shipment.
- The COC will be completed by field personnel as samples are collected and packed for shipment.
- Erroneous markings will be crossed-out with a single line and initialed by the author.
- The REMARKS space will be used to indicate if the sample is a matrix spike, matrix spike duplicate, or matrix duplicate.

- Trip and field blanks will be listed on separate rows.
- After the samples have been collected and sample information has been listed on the COC form, the method of shipment, the shipping cooler identification number(s), and the shipper air bill number will be entered on the COC.
- A second member of the field team will review the COC for completeness and accuracy whenever possible.
- Finally, a member of the sampling team will write his/her signature, the date, and time on the first RELINQUISHED BY space. Duplicate copies of each COC must be completed.
- One copy of the COC will be retained by sampling personnel. Blind duplicate samples will be identified on the copy retained by the sampling crew. The original will be sealed in a plastic bag and taped inside the lid of the shipping cooler without the additional identification of blind duplicate samples.
- Sample shipments will be refrigerated at 4°C, typically by packing with ice, to preserve the samples during shipment.
- After the shipping cooler is closed, custody seals provided by the laboratory will be affixed to the latch and across the front and back of the cooler lid, and signed by the person relinquishing the samples to the shipper.
- The seal will be covered with clear tape, and the cooler lid will be secured by wrapping with packing tape.
- The cooler will be relinquished to the shipper, typically an overnight carrier.
- The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the samples will not be analyzed.
- The samples must be delivered to the laboratory within 48 hours of collection.

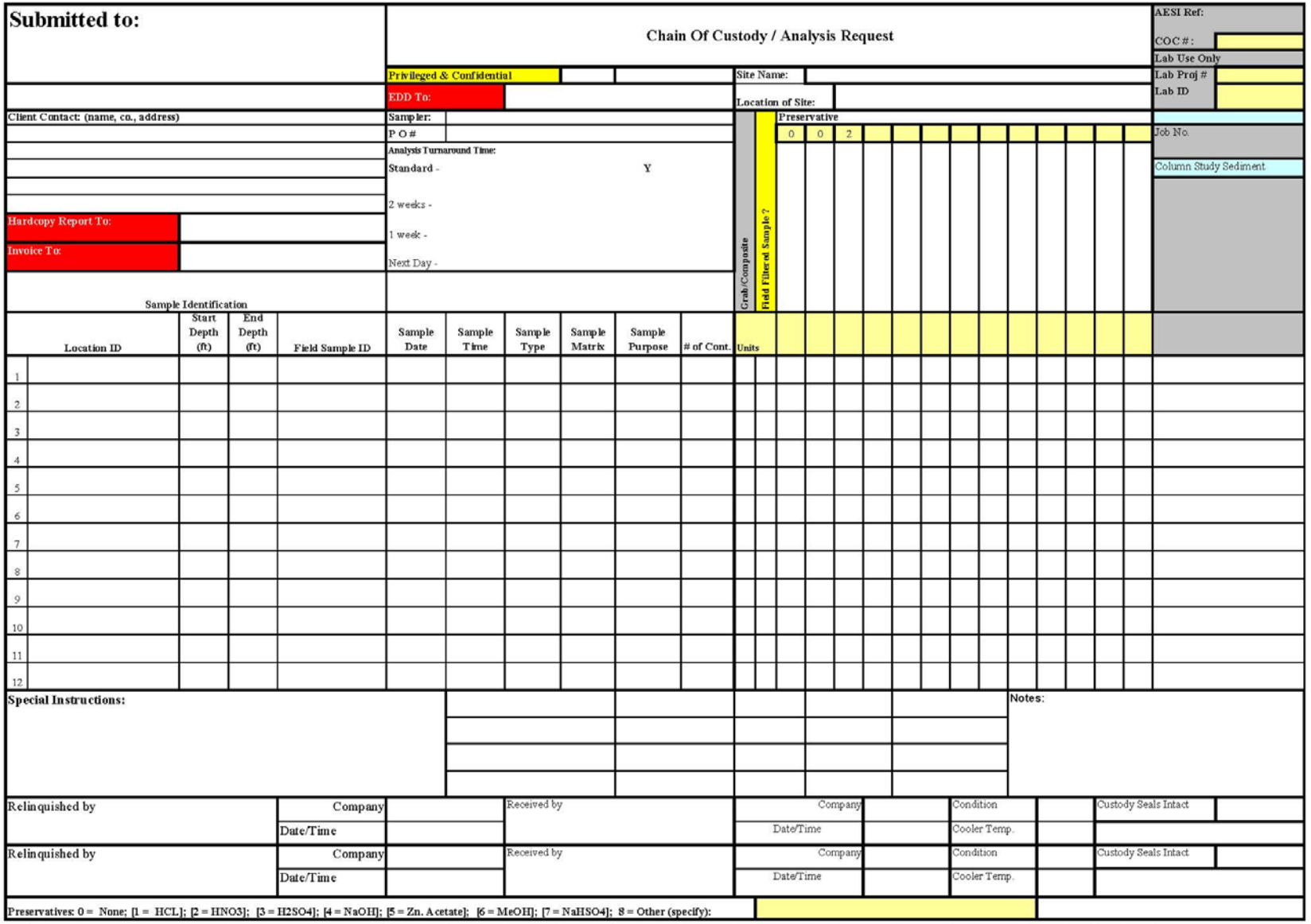
7.3 SAMPLE DOCUMENTATION

The field team leader will be retaining a copy of the COC, and, in addition, the field team leader will ensure that the following information about each sample is recorded in the field book and/or on the sample logs:

- Sample identifier;
- Identification of sampled media (e.g., groundwater);
- Sample location with respect to known reference point;
- Physical description of sample location;
- Field measurements, (e.g., pH, temperature, conductivity, and water levels);
- Date and time of collection;
- Sample collection method;
- Volume of groundwater purged before sampling;
- Number of sample containers;
- Analytical parameters;
- Preservatives used; and

- Shipping information:
  - Dates and method of sample shipments;
  - Chain-of-Custody Record numbers;
  - Federal Express Air Bill numbers; and
  - Sample recipient (e.g., laboratory name).

Figure 7.1 Chain-of-Custody Form



Submitted to:

Chain Of Custody / Analysis Request

AESI Ref:
COC #:
Lab Use Only
Lab Proj #
Lab ID

Privileged & Confidential
EDD To:
Site Name:
Location of Site:

Client Contact: (name, co., address)
Sampler:
P O #
Analysis Turnaround Time:
Standard - Y
2 weeks -
1 week -
Next Day -

Hardcopy Report To:
Invoice To:

Preservative: 0 0 2

Job No.
Column Study Sediment

Grab/Composite
Field Filtered Sample ?

Sample Identification

	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID	Sample Date	Sample Time	Sample Type	Sample Matrix	Sample Purpose	# of Cont.	Units
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Special Instructions:

Notes:

Relinquished by	Company		Received by	Company		Condition		Custody Seals Intact	
	Date/Time			Date/Time		Cooler Temp.			
Relinquished by	Company		Received by	Company		Condition		Custody Seals Intact	
	Date/Time			Date/Time		Cooler Temp.			

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn. Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (specify):

APPENDIX H
QUALITY ASSURANCE PROJECT PLAN

Quality Assurance Project Plan
Former Brown Manufacturing Site
Syracuse, New York

Prepared For:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

625 Broadway, 12th floor
Albany, NY 12233-7012

Prepared by:

PARSONS

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Syracuse, NY 13212

October 2017

SECTION 1

PROJECT DESCRIPTION

This Quality Assurance Project Plan (QAPP) specifies analytical methods to be used to ensure that data from the proposed site investigation are precise, accurate, representative, comparable, and complete.

1.1 INTRODUCTION

The remedial action was carried out at the Former Brown Manufacturing Site between 2016 and 2017 as required by the ROD and detailed in the Remedial Action Work Plan (Parsons, 2016). Soil was removed from the AOCs described in the ROD and clean fill was brought in to backfill. A delineation layer was laid over the site along with a two-foot cap of clean fill and top soil. Details of the remedial action can be found in the Final Engineering Report (Parsons, 2017). A Site Monitoring Plan (SMP) has been developed to describe the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site.

1.2 OBJECTIVES

The objective of this project is to define procedures and actions to ensure activities are carried out in accordance with requirements and to ensure all data quality objectives are met.

1.3 SCOPE OF WORK

The scope of work at the Former Brown Manufacturing Site is described in the site SMP. Samples will be collected from groundwater monitoring wells along with waste characterization samples from the sample purge water. Additionally, soil waste characterization samples may also be collected during intrusive work if necessary. These samples may be analyzed using the USEPA SW-846 "Test Methods for Evaluating Solid Waste," November 1986, 3rd edition (and subsequent updates).

SECTION 2

PROJECT ORGANIZATION

The project organization is described in the work plan.

SECTION 3

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) OBJECTIVES FOR MEASUREMENT OF DATA

3.1 INTRODUCTION

The quality assurance and quality control objectives for all measurement data include precision, accuracy, representativeness, completeness, and comparability. These objectives are defined in following subsections. They are formulated to meet the requirements of the USEPA SW-846. The analytical methods and their Contract Required Quantitation Limits (CRQLs) are given in Section 9.

3.2 PRECISION

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value (USEPA, 1987). Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), range (maximum value minus minimum value), relative range, and relative percent difference (RPD) are common.

For this project, field sampling precision will be determined by analyzing coded duplicate samples (labeled so that the laboratory does not recognize them as duplicates) for the same parameters, and then, during data validation (Section 10), calculating the RPD for duplicate sample results.

Analytical precision will be determined by the laboratory by calculating the RPD for the results of the analysis of internal QC duplicates and matrix spike duplicates. The formula for calculating RPD is as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where:

RPD	=	Relative Percent Difference.
V1, V2	=	The two values to be compared.
$\|V1 - V2\|$	=	The absolute value of the difference between the two values.
$(V1 + V2)/2$	=	The average of the two values.

The data quality objectives for analytical precision, calculated as the RPD between duplicate analyses, are presented in Tables 3.1 and 3.2.

TABLE 3.1
QUALITY CONTROL LIMITS FOR WATER SAMPLES

		Laboratory Accuracy and Precision					
Analytical Parameters	**Analytical Method (a)**	**Matrix Spike (MS) Compounds**	**MS/MSD (b) % Recovery**	**MS/MSD RPD (c)**	**LCS (d) % Recovery**	**Surrogate Compounds**	**Surrogate % Recovery**
VOCs (e)	8260	1,1-Dichloroethane	61-145	14	NA	Toluene-d8	88-110
		Trichloroethene	71-120	14	NA	Bromofluorobenzene	86-115
		Benzene	76-127	11	NA	1,2-Dichloroethane-d4	76-114
		Toluene	76-125	13	NA		
		Chlorobenzene	75-130	13	NA		
SVOCs (f)	8270	Phenol	12-110	42	NA	Nitrobenzene-d5	35-114
		2-Chlorophenol	27-123	40	NA	2-Fluorobiphenyl	43-116
		1,4-Dichlorobenzene	36-97	28	NA	Terphenyl-d14	33-141
		N-Nitroso-di-n-propylamine	41-116	38	NA	Phenol-d5	10-110
		1,2,4-Trichlorobenzene	39-98	28	NA	2-Fluorophenol	21-110
		4-Chloro-3-methylphenol	23-97	42	NA	2,4,6-Tribromophenol	10-123
		Acenaphthene	46-118	31	NA	2-Chlorophenol-d4	33-110 (g)
		4-Nitrophenol	10-80	50	NA	1,2-Dichlorobenzene-d4	16-110 (g)
		2,4-Dinitrotoluene	24-96	38	NA		
		Pentachlorophenol	9-103	50	NA		
		Pyrene	26-127	31	NA		

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990; any subsequent revisions shall supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds
(f) Target Compound List Semivolatile Organic Compounds
(g) Limits are advisory only

NA - Not Applicable

TABLE 3.2
QUALITY CONTROL LIMITS FOR SOIL SAMPLES

		Laboratory Accuracy and Precision					
Analytical Parameter	**Analytical Method (a)**	**Matrix Spike (MS) Compounds**	**MS/MSD (b) % Recovery**	**MS/MSD RPD (c)**	**LCS (d) % Recovery**	**Surrogate Compounds**	**Surrogate % Recovery**
VOCs (e)	8260	1,1-Dichloroethane	59-172	22	NA	Toluene-d8	84-138
		Trichloroethene	62-137	24	NA	Bromofluorobenzene	59-113
		Benzene	66-142	21	NA	1,2-Dichloroethane-d4	70-121
		Toluene	59-139	21	NA		
		Chlorobenzene	60-133	21	NA		
SVOCs (f)	8270	Phenol	26-90	35	NA	Nitrobenzene-d5	23-120
		2-Chlorophenol	25-102	50	NA	2-Fluorobiphenyl	30-115
		1,4-Dichlorobenzene	28-104	27	NA	Terphenyl-d14	18-137
		N-Nitroso-di-n-propylamine	41-126	38	NA	Phenol-d5	24-113
		1,2,4-Trichlorobenzene	38-107	23	NA	2-Fluorophenol	25-121
		4-Chloro-3-methylphenol	26-103	33	NA	2,4,6-Tribromophenol	19-122
		Acenaphthene	31-137	19	NA	2-Chlorophenol-d4	20-130 (g)
		4-Nitrophenol	11-114	50	NA	1,2-Dichlorobenzene-d4	20-130 (g)
		2,4-Dinitrotoluene	28-89	47	NA		
		Pentachlorophenol	17-109	47	NA		
		Pyrene	35-142	36	NA		

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990, any subsequent revisions shall supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds
(f) Target Compound List Semivolatile Organic Compounds
(g) Limits are advisory only

NA - Not Applicable

3.3 ACCURACY

Accuracy is a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern (Taylor, 1987), or the difference between a measured value and the true or accepted reference value. The accuracy of an analytical procedure is best determined by the analysis of a sample containing a known quantity of material, and is expressed as the percent of the known quantity which is recovered or measured. The recovery of a given analyte is dependent upon the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the detection limit of the analytical method is also a major factor in determining the accuracy of the measurement. Concentrations of analytes which are close to the detection limits are less accurate because they are more affected by such factors as instrument "noise". Higher concentrations will not be as affected by instrument noise or other variables and thus will be more accurate.

Sampling accuracy may be determined through the assessment of the analytical results of field blanks and trip blanks for each sample set. Analytical accuracy is typically assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), and the percent recoveries of matrix spike compounds added to selected samples and laboratory blanks. Additionally, initial and continuing calibrations must be performed and accomplished within the established method control limits to define the instrument accuracy before analytical accuracy can be determined for any sample set.

Accuracy is normally measured as the percent recovery (%R) of a known amount of analyte, called a spike, added to a sample (matrix spike) or to a blank (blank spike). The %R is calculated as follows:

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:

%R	=	Percent recovery.
SSR	=	Spike sample result: concentration of analyte obtained by analyzing the sample with the spike added.
SR	=	Sample result: the background value, i.e., the concentration of the analyte obtained by analyzing the sample.
SA	=	Spiked analyte: concentration of the analyte spike added to the sample.

The acceptance limits for accuracy for each parameter are presented in Tables 3.1 and 3.2.

3.4 REPRESENTATIVENESS

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter which is most concerned with the proper design of the sampling program (USEPA, 1987). Samples must be representative of the environmental media being sampled. Selection of sample locations and sampling procedures will incorporate consideration of obtaining the most representative sample possible.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree that is technically possible, that the data derived represents the in-place quality of the material sampled. Every effort will be made to ensure chemical compounds will not be introduced into the sample via sample containers, handling, and analysis. Decontamination of sampling devices and digging equipment will be performed between samples as outlined in the Field Sampling Plan. Laboratory sample containers will be thoroughly cleaned in accordance with procedures outlined in Section 6.2. Analysis of field blanks, trip blanks, and method blanks will also be performed to monitor for potential sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. Sampling heterogeneity will be evaluated during data validation through the analysis of coded field duplicate samples. The analytical laboratory will also follow acceptable procedures to assure the samples are adequately homogenized prior to taking aliquots for analysis, so the reported results are representative of the sample received.

Chain-of-custody procedures will be followed to document that contamination of samples has not occurred during container preparation, shipment, and sampling. Details of blank, duplicate and Chain-of-custody procedures are presented in Sections 6 and 7.

3.5 COMPLETENESS

Completeness is defined as the percentage of measurements made which are judged to be valid (USEPA, 1987). The QC objective for completeness is generation of valid data for at least 90 percent of the analyses requested. Completeness is defined as follows for all sample measurements:

$$\%C = \frac{V}{T} \times 100$$

where:

%C = Percent completeness.

V = Number of measurements judged valid.

T = Total number of measurements.

3.6 COMPARABILITY

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). The comparability of all data collected for this project will be ensured by:

- Using identified standard methods for both sampling and analysis phases of this project;
- Requiring traceability of all analytical standards and/or source materials to the U.S. Environmental Protection Agency (USEPA) or National Institute of Standards and Technology (NIST);
- Requiring that all calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable);
- Using standard reporting units and reporting formats including the reporting of QC data;
- Performing a complete data validation on a representative fraction of the analytical results, including the use of data qualifiers in all cases where appropriate; and
- Requiring that all validation qualifiers be used any time an analytical result is used for any purpose.

These steps will ensure all future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

SECTION 4

SAMPLING PROGRAM

4.1 INTRODUCTION

Sampling program will provide data concerning the presence and the nature and extent of contamination of groundwater and provide water and soil waste characterization. This section presents sample container preparation procedures, sample preservation procedures, sample holding times, and field QC sample requirements. Sample locations, and the number of environmental and QC samples to be taken are given in Table 4.1. The sampling procedures are presented in the Field Sampling Plan.

4.2 SAMPLE CONTAINER PREPARATION AND SAMPLE PRESERVATION

Sample containers will be properly washed and decontaminated prior to their use by either the analytical laboratory or the container vendor to the specifications required by the USEPA. Copies of the sample container QC analyses will be provided by the laboratory for each container lot used to obtain samples. The containers will be tagged, the appropriate preservatives will be added. The types of containers are shown in Tables 4.2 and 4.3.

Samples shall be preserved according to the preservation techniques given in Tables 4.2 and 4.3. Preservatives will be added to the sample bottles by the laboratory prior to their shipment in sufficient quantities to ensure that proper sample pH is met. Following sample collection, the sample bottles should be placed on ice in the shipping cooler, cooled to 4^{o}C with ice or "blue ice", and delivered to the laboratory within 48 hours of collection. Chain-of-custody procedures are described in Section 7.

4.3 SAMPLE HOLDING TIMES

The sample holding times for organic and inorganic parameters are given in Tables 4.2 and 4.3 and must be in accordance with the NYSDEC ASP requirements. Holding times for Toxicity Characteristic Leaching Procedure (TCLP) samples are given in Table 4.4. The NYSDEC ASP holding times must be strictly adhered to by the laboratory.

4.4 FIELD QC SAMPLES

To assess field sampling and decontamination performance, two types of "blanks" will be collected and submitted to the laboratory for analyses. In addition, the precision of field sampling procedures will be assessed by collecting coded field duplicates and matrix spike/matrix spike duplicates (MS/MSDs). The blanks will include:

a. Trip Blanks - A Trip Blank will be prepared before the sample containers are sent by the laboratory. The trip blank will consist a 40-ml VOA vial containing distilled, deionized water which accompanies the other water sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples for target compound list (TCL) volatiles analysis. The Trip Blank will be analyzed for TCL volatile organic compounds to access any contamination from sampling and transport, and internal laboratory procedures.

b. Field Blanks - Field Blanks will be taken at a minimum frequency of one per 20 field samples per sample matrix. If dedicated sampling equipment is used to collect samples, only one field blank will be collected per each sample matrix for the duration of the sampling event. Field blanks are used to determine the effectiveness of the decontamination procedures for sampling equipment. It is a sample of deionized, distilled water provided by the laboratory which has passed through the decontaminated sampling apparatus. It is usually collected as a last step in the decontamination procedure, prior to taking an environmental sample. The field blank may be analyzed for all or some of the parameters of interest.

The duplicates will consist of:

a. Coded Field Duplicate - To determine the representativeness of the sampling methods, coded field duplicates will be collected. The samples are termed "coded" because they will be labeled in such a manner that the laboratory will not be able to determine that they are a duplicate sample. This will eliminate any possible bias that could arise.

b. Matrix Spike/Matrix Spike Duplicate (MS/MSD) - MS/MSD samples (MS/MSD for organics; MS and laboratory duplicate for inorganics) will be taken at a frequency of one pair per 20 field samples. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes. The percent recoveries and RPDs are given in Tables 3.1 and 3.2.

TABLE 4-1
SUMMARY OF SAMPLES AND ANALYSES

Matrix	Parameter	Analytical Method	Field Samples				QC Blanks		Total
			Field Samples	Field Duplicate	MS/MSD[(a)] (Total)	Sub-Total	Trip Blank	Field Blank	
Groundwater Samples (4 monitoring wells)	Volatile Organics	EPA SW 8260*	4	1	2	7	1	-	8
	Semivolatile Organics	EPA SW 8270B	4	1	2	7	-	-	7
Investigation Derived Waste Characterization (soils)	TCLP VOCs	EPA SW 1311/8260	1	-	-	1	-	-	1
	TCLP SVOCs	EPA SW 1311/8270B	1	-	-	1	-	-	1
	TCLP PCBs	EPA SW 1311/8082	1	-	-	1	-	-	1
	TCLP Metals	EPA SW 1311/6010A/6010B	1	-	-	1	-	-	1
Investigation Derived Waste Characterization (water)	TCLP VOCs	EPA SW 8260	1	-	-	1	-	-	1
	TCLP SVOCs	EPA SW 8270B	1	-	-	1	-	-	1
	TCLP PCBs	EPA SW 8082	1	-	-	1	-	-	1
	TCLP Metals	EPA SW 6010A/6020B	1	-	-	1	-	-	1

TCLP - Toxicity Characteristic Leaching Procedure

(a) Matrix spike / matrix spike duplicate for organic analyses; matrix spike and laboratory duplicate for inorganic analysis.

TABLE 4.2

WATER SAMPLE CONTAINERIZATION, PRESERVATION, AND HOLDING TIMES

Analysis	Bottle Type	Preservation (a)	Holding Time (b)
Volatile Organic Compounds (VOCs)	2-40 mL glass vial w/ Teflon septum	Cool to 4^{o}C	10 days
Semivolatile Organics Compounds (SVOCs)	1000 mL glass w/ Teflon lined cap	Cool to 4^{o}C	5 days*

(a) All samples to be preserved in ice during collection and transport.

(b) Days from validated time of sample receipt (VTSR).

TABLE 4.3

WASTE SAMPLE CONTAINERIZATION AND HOLDING TIMES

Analysis	Bottle Type	Preservation [a]	Holding Time [b]
Volatile Organic Compounds (VOCs)	Wide-mouth glass w/ teflon lined cap	Cool to 4°C	10 days
Other Organic Compounds [c]	Wide-mouth glass w/ teflon lined cap	Cool to 4°C	10 days*
Metals	Wide-mouth plastic or glass	Cool to 4°C	6 months, except mercury (26 days)
Cyanide	Wide-mouth plastic	Cool to 4°C	14 days
TCLP Organic Compounds	Wide-mouth glass w/ teflon lined cap	Cool to 4°C	See Table 4.4
TCLP Metals	Wide-mouth plastic or glass	Cool to 4°C	See Table 4.4

(a) All samples to be preserved in ice during collection and transport.
(b) Days from date of sample collection.
(c) Semivolatile organic compounds or PCBs.
* Sohxlet or sonication procedures for extraction and concentration of soil/waste samples for SVOCs must be completed within 10 days of VTSR. Sohxlet or sonication procedures for extraction and concentration of soil/ waste samples for PCBs must be completed within 10 days of VTSR. Extracts of soil samples must be analyzed within 40 days of extraction.

TABLE 4.4

TCLP(a) SAMPLE HOLDING TIMES

Analytical Parameter	From: Sample Collection To: TCLP Extraction	From: TCLP Extraction To: Preparative Extraction	From: Preparative Extraction To: Determinative Analysis
Volatiles	14 days	NA	14 days
Semivolatiles	14 days	7 days	40 days
Mercury	26 days	NA	26 days
Metals (except Mercury)	180 days	NA	180 days

(a) Toxicity Characteristic Leaching Procedure

NA - Not Applicable

SECTION 5

SAMPLE TRACKING AND CUSTODY

5.1 INTRODUCTION

This section presents sample custody procedures for both the field and laboratory. Implementation of proper custody procedures for samples generated in the field is the responsibility of field personnel. Both laboratory and field personnel involved in the Chain-of-custody (COC) and transfer of samples will be trained as to the purpose and procedures prior to implementation.

Evidence of sample traceability and integrity is provided by COC procedures. These procedures document the sample traceability from the selection and preparation of the sample containers by the laboratory, to sample collection, to sample shipment, to laboratory receipt and analysis. The sample custody flowchart is shown in Figure 5.1. A sample is considered to be in a person's custody if the sample is:

- In a person's possession;
- Maintained in view after possession is accepted and documented;
- Locked and tagged with Custody Seals so that no one can tamper with it after having been in physical custody; or
- In a secured area which is restricted to authorized personnel.

5.2 FIELD SAMPLE CUSTODY

A COC record (Figure 5.2 or similar) accompanies the sample containers from selection and preparation at the laboratory, during shipment to the field for sample containment and preservation, and during return to the laboratory. The COC lists the field personnel responsible for taking samples, the project name and number, the name of the analytical laboratory to which the samples are sent, and the method of sample shipment. The COC also lists a unique description of every sample bottle in the set. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample.

The REMARKS space on the COC is used to indicate if the sample is a matrix spike, matrix spike duplicate, or any other sample information for the laboratory. Since they are not specific to any one sample point, trip and field blanks are indicated on separate rows. Once all bottles are properly accounted for on the form, a sampler will write his or her signature and the date and time on the first RELINQUISHED BY space. The sampler will also write the method of shipment, the shipping cooler identification number, and the shipper airbill number on the top of the COC. Mistakes will be crossed out with a single line in ink and initialed by the author.

One copy of the COC is retained by sampling personnel and at least one copy is put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the samples signs their name across the seal. The seal is taped, and the cooler is wrapped tightly with clear packing tape. It is then relinquished by field personnel to personnel responsible for shipment, typically an overnight carrier. The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the sample will not be analyzed.

5.3 LABORATORY SAMPLE CUSTODY

The Project Manager or Field Team Leader will notify the laboratory of upcoming field sampling activities, and the subsequent shipment of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

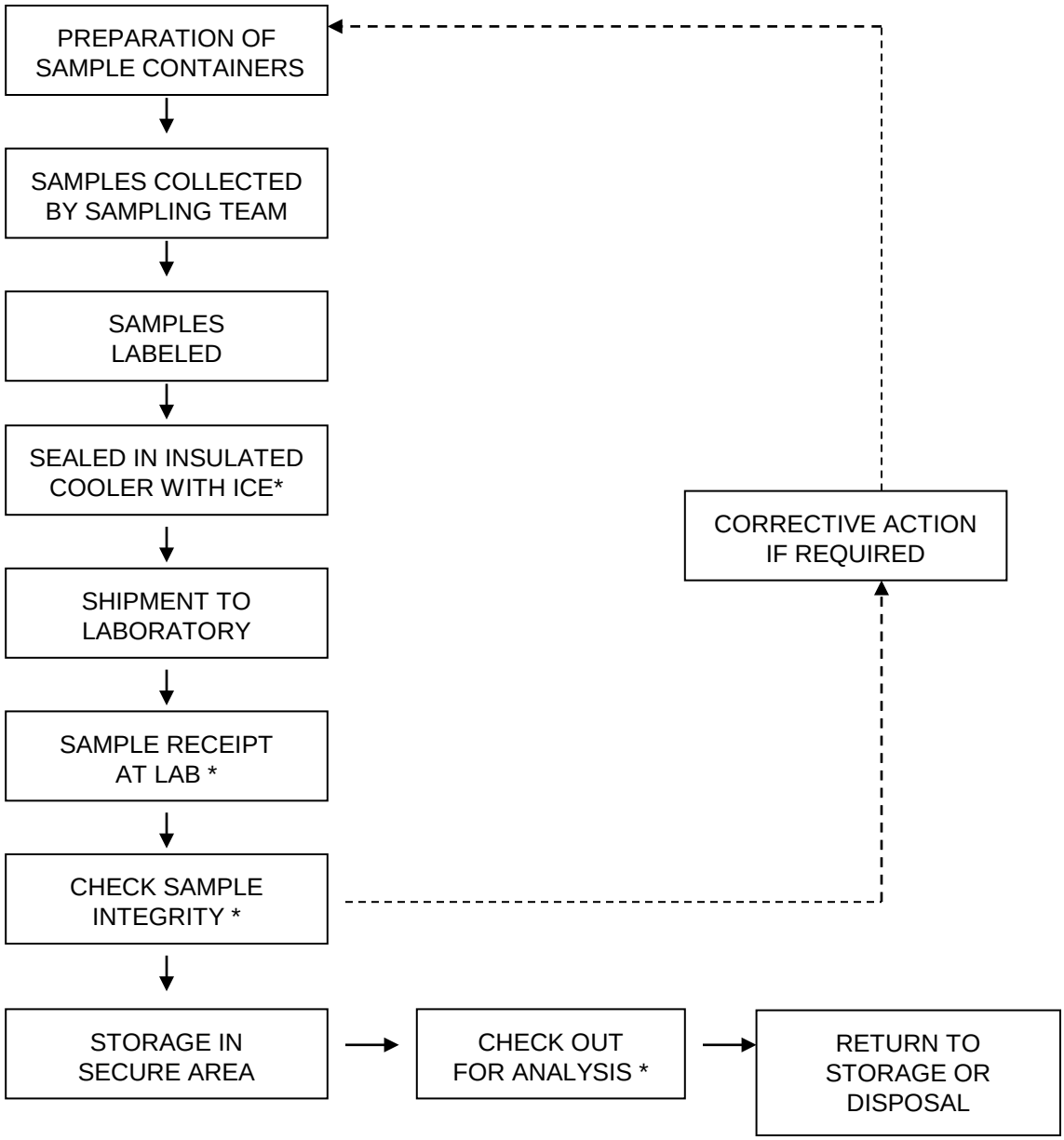
The following laboratory sample custody procedures will be used:

- The laboratory will designate a sample custodian who will be responsible for maintaining custody of the samples, and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check cooler temperature, and check the original COC documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian will sign the COC record and record the date and time received.
- Care will be exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the Project Manager or Field Team Leader as part of the corrective action process. A qualitative assessment of each sample container will be performed to note any anomalies, such as broken or leaking bottles. This assessment will be recorded as part of the incoming chain-of-custody procedure.
- The samples will be stored in a secured area at a temperature of approximately 4 degrees Celsius until analyses commence.
- A laboratory tracking record will accompany the sample or sample fraction through final analysis for control.

A copy of the tracking record will accompany the laboratory report and will become a permanent part of the project records.

FIGURE 5.1

SAMPLE CUSTODY



* REQUIRES SIGN-OFF ON CHAIN-OF-CUSTODY FORM

Figure 5.2 Chain-of-Custody Record

Submitted to:

Chain Of Custody / Analysis Request

AESI Ref:
COC #:
Lab Use Only
Lab Proj #
Lab ID

Privileged & Confidential
EDD To:
Site Name:
Location of Site:

Client Contact: (name, co., address)
Sampler:
P O #
Analysis Turnaround Time:
Standard - Y
2 weeks -
1 week -
Next Day -
Hardcopy Report To:
Invoice To:

Preservative: 0 0 2
Job No.
Column Study Sediment

	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID	Sample Date	Sample Time	Sample Type	Sample Matrix	Sample Purpose	# of Cont.	Grab/Composite	Field Filtered Sample ?	Units
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

Sample Identification

Special Instructions:

Notes:

Relinquished by	Company		Received by	Company		Condition	Custody Seals Intact
	Date/Time			Date/Time		Cooler Temp.	
Relinquished by	Company		Received by	Company		Condition	Custody Seals Intact
	Date/Time			Date/Time		Cooler Temp.	

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn. Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (specify):

SECTION 6

CALIBRATION PROCEDURES

6.1 FIELD INSTRUMENTS

All field analytical equipment will be calibrated immediately prior to each day's use. The calibration procedures will conform to manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. Records of all instrument calibration will be maintained by the Field Team Leader. Copies of all the instrument manuals will be maintained on-site by the Field Team Leader.

6.2 LABORATORY INSTRUMENTS

The laboratory will follow all calibration procedures and schedules as specified in the sections of the USEPA SW-846 and subsequent updates which apply to the instruments necessary for the analytical methods given in Section 7.

SECTION 7

ANALYTICAL PROCEDURES

7.1 INTRODUCTION

Samples will be analyzed according to the USEPA SW-846 "Test Methods for Evaluating Solid Waste," November 1986, 3rd edition and subsequent updates. The methods to be used for the laboratory analysis of water and soil samples are presented in Tables 7.1 and 7.2. These methods were selected because they attain the quantitation limits which are compiled on Tables 7.1 and 7.2.

TABLE 7.1
PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Quantitation Limits Water (ug/L)	Quantitation Limits Soil (ug/kg)	State of New York Standards Water (ug/L) [a]	State of New York Standards Soil (ug/kg) [b]
	Volatile Organics (25 ml purge)					
1	1,1,1-Trichloroethane	SW8260B	1	5	5	800
2	1,1,2,2-Tetrachloroethane	SW8260B	1	5	5	600
3	1,1,2-Trichloroethane	SW8260B	1	5	1	
4	1,1-Dichloroethane	SW8260B	1	5	5	200
5	1,1-Dichloroethene	SW8260B	1	5	5	400
6	1,2-Dichloroethane	SW8260B	1	5	0.6	100
7	1,2-Dichloroethene(total)	SW8260B	1	5	5	300
8	1,2-Dichloropropane	SW8260B	1	5	1	
9	2-Butanone (MEK)	SW8260B	10	20		300
10	2-Hexanone	SW8260B	10	20		
11	4-Methyl-2-pentanone(MIBK)	SW8260B	5	20		1000
12	Acetone	SW8260B	10	20		200
13	Benzene	SW8260B	1	5	1	60
14	Bromodichloromethane	SW8260B	1	5		
15	Bromoform	SW8260B	1	5		
16	Bromomethane	SW8260B	2	10	5	
17	Carbon Disulfide	SW8260B	1	5		2700
18	Carbon Tetrachloride	SW8260B	1	5	5	600
19	Chlorobenzene	SW8260B	1	5	5	1700
20	Chloroethane	SW8260B	2	10	5	1900
21	Chloroform	SW8260B	1	5	7	300
22	Chloromethane	SW8260B	2	10	5	
23	cis-1,3-Dichloropropene	SW8260B	1	5	0.4	
24	Dibromochloromethane	SW8260B	1	5	5	
25	Ethyl Benzene	SW8260B	1	5	5	5500
26	Methylene Chloride	SW8260B	1	5	5	100
27	Styrene	SW8260B	1	5	5	
28	Tetrachloroethene	SW8260B	1	5	5	1400
29	Toluene	SW8260B	1	5	5	1500
30	trans-1,3-Dichloropropene	SW8260B	1	5	0.4	
31	Trichloroethene	SW8260B	1	5	5	700
32	Vinyl Chloride	SW8260B	2	10	2	200
33	Xylenes(total)	SW8260B	1	5	5	1200

TABLE 7.1
PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Quantitation Limits Water (ug/L)	Quantitation Limits Soil (ug/kg)	State of New York Standards Water (ug/L)	State of New York Standards Soil (ug/kg)
	Semivolatile Organics					
1	1,2,4-Trichlorobenzene	SW8270C	10	330	5	3400
2	1,2-Dichlorobenzene	SW8270C	10	330	3	7900
3	1,3-Dichlorobenzene	SW8270C	10	330	3	1600
4	1,4-Dichlorobenzene	SW8270C	10	330	3	8500
5	2,2'-oxybis(1-chloropropane)*	SW8270C	10	330	5	
6	2,4,5-Trichlorophenol	SW8270C	25	330	1	100
7	2,4,6-Trichlorophenol	SW8270C	10	330	1	
8	2,4-Dichlorophenol	SW8270C	10	330	1	400
9	2,4-Dimethylphenol	SW8270C	10	330	1	
10	2,4-Dinitrophenol	SW8270C	25	330	1	200
11	2,4-Dinitrotoluene	SW8270C	10	330	5	
12	2,6-Dinitrotoluene	SW8270C	10	330	5	1000
13	2-Chloronaphthalene	SW8270C	10	330		
14	2-Chlorophenol	SW8270C	10	330	1	800
15	2-methyl-4,6-Dinitrophenol	SW8270C	25	330		
16	2-Methylnaphthalene	SW8270C	10	330		36400
17	2-Methylphenol	SW8270C	10	330	1	100
18	2-Nitrolaniline	SW8270C	25	330	5	430
19	2-Nitrophenol	SW8270C	10	330	1	330
20	3,3'-Dichlorobenzidine	SW8270C	10	330	5	
21	3-Nitroaniline	SW8270C	25	330	5	500
22	4-Bromophenyl-phenyl ether	SW8270C	10	330		
23	4-Chloro-3-methylphenol	SW8270C	10	330		240
24	4-Chloroaniline	SW8270C	10	330	5	220
25	4-Chlorophenyl-phenyl ether	SW8270C	10	330		
26	4-Methylphenol	SW8270C	10	330	1	900
27	4-Nitroaniline	SW8270C	25	330	5	
28	4-Nitrophenol	SW8270C	25	330	1	100
29	Acenaphthene	SW8270C	10	330		50000
30	Acenaphthylene	SW8270C	10	330		41000
31	Anthracene	SW8270C	10	330		50000
32	Benzo(a)anthracene	SW8270C	10	330		224
33	Benzo(a)pyrene	SW8270C	10	330		61
34	Benzo(b)fluoranthene	SW8270C	10	330		1100

TABLE 7.1
PROJECT QUANTITATION LIMITS

			Quantitation Limits		State of New York Standards	
	Analysis/Compound	**Method**	**Water (ug/L)**	**Soil (ug/kg)**	**Water (ug/L)**	**Soil (ug/kg)**
	Semivolatile Organics, cont.					
35	Benzo(g,h,i)perylene	SW8270C	10	330		50000
36	Benzo(k)fluoranthene	SW8270C	10	330		1100
37	bis(2-Chloroethoxy) methane	SW8270C	10	330	5	
38	bis(2-Chloroethyl) ether	SW8270C	10	330	1	
39	bis(2-ethylhexyl)phthalate	SW8270C	10	330	5	50000
40	Butylbenzylphthalate	SW8270C	10	330		50000
41	Carbazole	SW8270C	10	330		
42	Chrysene	SW8270C	10	330		400
43	Di-n-butylphthalate	SW8270C	10	330	50	8100
44	Di-n-octylphthalate	SW8270C	10	330		50000
45	Dibenz(a,h)anthracene	SW8270C	10	330		14
46	Dibenzofuran	SW8270C	10	330		6200
47	Diethylphthalate	SW8270C	10	330		7100
48	Dimethylphthalate	SW8270C	10	330		2000
49	Fluoranthene	SW8270C	10	330		50000
50	Fluorene	SW8270C	10	330		50000
51	Hexachlorobenzene	SW8270C	NA (8081A)	330		410
52	Hexachlorobutadiene	SW8270C	10	330	0.5	
53	Hexachlorocyclopentadiene	SW8270C	10	330	5	
54	Hexachloroethane	SW8270C	10	330	5	
55	Indeno(1,2,3-cd)pyrene	SW8270C	10	330		3200
56	Isophorone	SW8270C	10	330		4400
57	N-Nitroso-di-n-propylamine	SW8270C	10	330		
58	N-nitrosodiphenylamine	SW8270C	10	330		
59	Naphthalene	SW8270C	10	330		13000
60	Nitrobenzene	SW8270C	10	330	0.4	200
61	Pentachlorophenol	SW8270C	25	330	1	1000
62	Phenanthrene	SW8270C	10	330		50000
63	Phenol	SW8270C	10	330	1	30
64	Pyrene	SW8270C	10	330		50000

TABLE 7.1
PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Estimated Quantitation Limits Water (ug/L)	Soil (ug/kg)	State of New York Standards Water (ug/L)	Soil (ug/kg)
	PCBs					
1	Aroclor-1016	SW8082	1.0	33	0.09	1000
2	Aroclor-1221	SW8082	2.0	33	0.09	1000
3	Aroclor-1232	SW8082	1.0	33	0.09	1000
4	Aroclor-1242	SW8082	1.0	33	0.09	1000
5	Aroclor-1248	SW8082	1.0	33	0.09	1000
6	Aroclor-1254	SW8082	1.0	33	0.09	1000
7	Aroclor-1260	SW8082	1.0	33	0.09	1000
	Metals		**Water (mg/L)**	**Soil (mg/kg)**	**Water (mg/L)**	**Soil (mg/kg)**
1	Antimony	SW6010B	0.006	5.0	0.003	
2	Arsenic	SW6010B	0.01	1	0.025	7.5
3	Barium	SW6010B	0.01	1	1	300
4	Beryllium	SW6010B	0.005	0.5	0.003	0.16
5	Cadmium	SW6010B	0.005	0.5	0.005	1
6	Chromium	SW6010B	0.01	1	0.05	10
7	Copper	SW6010B	0.03	2.5	0.2	25
8	Lead	SW6010B	0.01	0.5	0.025	400[(c)]
9	Mercury	SW7470A/7471A	0.0002	0.01	0.0007	0.1
10	Nickel	SW6010B	0.04	4	0.1	13
11	Selenium	SW6010B	0.01	1	0.01	2
12	Silver	SW6010B	0.01	1	0.05	
13	Thallium	SW7841	0.002	1	0.0005	
14	Zinc	SW6010B	0.02	2	2	20
*15	Vanadium	SW6010B	0.05	1	0.0005	150
*16	Cobalt	SW6010B	0.05	1		30
*17	Aluminum	SW6010B	0.2	20		
*18	Calcium	SW6010B	5	500		
*19	Iron	SW6010B	0.1	10	0.3	2000

TABLE 7.1
PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Estimated Quantitation Limits Water (ug/L)	Soil (ug/kg)	State of New York Standards Water (ug/L)	Soil (ug/kg)
	Metals, cont.					
*20	Magnesium	SW6010B	5	500	35	
*21	Manganese	SW6010B	0.015	1.5	0.3	
*22	Potassium	SW6010B	5	500		
*23	Sodium	SW6010B	5	500	20	
*24	Cyanide	SW9010A	0.01	0.01	200	

Notes:
N/A - Not Applicable
(a) - Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, NYSDEC, October 1993
(b) - Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, January 24, 1994
(c) - EPA Guidance on Residential Lead-Based Paint, Lead Contaminated Dust, and Lead Contaminated Soil, July 14, 1994

TABLE 7.2
PRACTICAL QUANTITATION LIMITS (PQLs)

TCLP VOLATILE	SW-846 Analysis	Water (ug/L)
Benzene	8240B	5
Carbon Tetrachloride	8240B	5
Chloroform	8240B	5
1,2-Dichlorethane	8240B	5
1,1-Dichloroethene	8240B	5
2-Butanone	8240B	100
Tetrachloroethene	8240B	5
Trichloroethene	8240B	5
Vinyl Chloride	8240B	100

TCLP SEMIVOLATILE	SW-846 Analysis	Water (ug/L)
2-Methylphenol	3510 / 8270B	10
3 & 4-Methylphenol	3510 / 8270B	10
1,4-Dichlorobenzene	3510 / 8270B	10
2,4-Dinitrotoluene	3510 / 8270B	10
Hexachlorobutadiene	3510 / 8270B	10
Hexachloroethane	3510 / 8270B	10
Hexachlorobenzene	3510 / 8270B	10
Nitrobenzene	3510 / 8270B	10
Pentachlorophenol	3510 / 8270B	50
Pyridine	3510 / 8270B	ND
2,4,5-Trichlorophenol	3510 / 8270B	10
2,4,6-Trichlorophenol	3510 / 8270B	10

TCLP METALS	SW-846 Analysis	Water (mg/L)
Arsenic	3010 / 6010	0.05
Barium	3010 / 6010	0.002
Cadmium	3010 / 6010	0.004
Chromium	3010 / 6010	0.007
Lead	3010 / 6010	0.04
Selenium	3010 / 6010	0.07
Silver	7760 / 6010	0.007
Mercury	7470	0.0002

ND - Not Determined

SECTION 8

DATA REDUCTION, VALIDATION, AND REPORTING

8.1 INTRODUCTION

Data collected during the field investigation will be reduced, reviewed, and a report on the findings will be tabulated in a standard format. The criteria used to identify and quantify the analytes will be those specified for the applicable methods in the USEPA SW-846 and subsequent updates. The data package provided by the laboratory will contain all items specified in the USEPA SW-846 appropriate for the analyses to be performed, and be reported in standard format.

The completed copies of the Chain-of-custody records (both external and internal) accompanying each sample from time of initial bottle preparation to completion of analysis shall be attached to the analytical reports.

8.2 DATA REDUCTION

Two copies of the analytical data packages will be provided by the laboratory. The NYSDEC Project Manager will immediately arrange for filing one package; a second copy will be sent to the Engineer and used to generate summary tables. These tables will form the database for assessment of the site contamination condition. For purposes of reporting regular annual monitoring, results will be reported in a Category A report format. For any sampling proposed as final round or other decision point, results will be reported in a Category B format with data validation.

SECTION 9

INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

9.1 QUALITY ASSURANCE BATCHING

Each set of samples will be analyzed concurrently with calibration standards, method blanks, matrix spikes (MS), matrix spike duplicates (MSD) or laboratory duplicates, and QC check samples (if required by the protocol). The MS/MSD samples will be designated by the field personnel.

9.2 CALIBRATION STANDARDS AND SURROGATES

All organic standard and surrogate compounds are checked by the method of mass spectrometry for correct identification and gas chromatography for degree of purity and concentration. All standards are traceable to a source of known quality certified by the USEPA or NIST, or other similar program. When the compounds pass the identity and purity tests, they are certified for use in standard and surrogate solutions. Concentrations of the solutions are checked for accuracy before release for laboratory use. Standard solutions are replaced monthly or more frequently, based upon data indicating deterioration.

9.3 ORGANIC BLANKS AND MATRIX SPIKE

Analysis of blank samples verifies that the analytical method does not introduce contaminants or detect "false positives". The blank water can be generated by reverse osmosis and Super-Q filtration systems, or distillation of water containing $KMnO_4$. The matrix spike is generated by addition of surrogate standard to each sample.

9.4 TRIP AND FIELD BLANKS

Trip blanks and field blanks will be utilized in accordance with the specifications in Section 4. These blanks will be analyzed to provide a check on sample bottle preparation and to evaluate the possibility of atmospheric or cross contamination of the samples.

SECTION 10

QUALITY ASSURANCE PERFORMANCE AUDITS AND SYSTEM AUDITS

10.1 INTRODUCTION

Quality assurance audits may be performed by the project quality assurance group under the direction and approval of the project Quality Assurance Officer (QAO). These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s). Functioning as an independent body and reporting directly to corporate quality assurance management, the QAO may plan, schedule, and approve system and performance audits based upon procedures customized to the project requirements. At times, the QAO may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. However, these personnel will not have responsibility for the project work associated with the performance audit.

10.2 SYSTEM AUDITS

System audits may be performed by the QAO or designated auditors, and encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory quality control procedures and associated documentation may be system audited. These audits may be performed once during the performance of the project. However, if conditions adverse to quality are detected or if the Project Manager requests, additional audits may occur.

10.3 PERFORMANCE AUDITS

The laboratory may be required to conduct an analysis of Performance Evaluation (PE) samples or provide proof that Performance Evaluation samples submitted by USEPA or a state agency have been analyzed within the past twelve months.

10.4 FORMAL AUDITS

Formal audits refer to any system or performance audit that is documented and implemented by the QA group. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklists to objectively verify that quality assurance requirements have been developed, documented, and instituted in accordance with contractual and project criteria. Formal audits may be performed on project and subcontractor work at various locations.

Audit reports will be written by auditors who have performed the site audit after gathering and evaluating all data. Items, activities, and documents determined by lead auditors to be in noncompliance shall be identified at exit interviews conducted with the involved management. Noncompliances will be logged, and documented through audit findings which are attached to and are a part of the integral audit report. These audit finding forms are directed to management to satisfactorily resolve the noncompliance in a specified and timely manner.

The Project Manager has overall responsibility to ensure that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports must be submitted to the Project Manager within fifteen days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the QAO prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the QAO will close out the audit report and findings.

SECTION 11

PREVENTIVE MAINTENANCE PROCEDURES AND SCHEDULES

11.1 PREVENTIVE MAINTENANCE PROCEDURES

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedure developed by the operators.

A list of critical spare parts will be established by the operator. These spare parts will be available for use in order to reduce the downtime. A service contract for rapid instrument repair or backup instruments may be substituted for the spare part inventory.

11.2 SCHEDULES

Written procedures will establish the schedule for servicing critical items in order to minimize the downtime of the measurement system. The laboratory will adhere to the maintenance schedule, and arrange any necessary and prompt service. Required service will be performed by qualified personnel.

11.3 RECORDS

Logs shall be established to record and control maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced shall be reviewed, maintained, and filed by the operators at the laboratories. The QAO may audit these records to verify complete adherence to these procedures.

SECTION 12

CORRECTIVE ACTION

12.1 INTRODUCTION

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected.

12.2 PROCEDURE DESCRIPTION

When a significant condition adverse to quality is noted at site, laboratory, or subcontractor location, the cause of the condition will be determined and corrective action will be taken to preclude repetition. Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO, Project Manager, Field Team Leader and involved contractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action.

All project personnel have the responsibility, as part of the normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality. Corrective actions will be initiated as follows:

- When predetermined acceptance standards are not attained;
- When procedure or data compiled are determined to be deficient;
- When equipment or instrumentation is found to be faulty;
- When samples and analytical test results are not clearly traceable;
- When quality assurance requirements have been violated;
- When designated approvals have been circumvented;
- As a result of system and performance audits;
- As a result of a management assessment;
- As a result of laboratory/field comparison studies; and
- As required by USEPA SW-846, and subsequent updates, or by the NYSDEC ASP.

Project management and staff, such as field investigation teams, remedial response planning personnel, and laboratory groups, monitor on-going work performance in the

normal course of daily responsibilities. Work may be audited at the sites, laboratories, or contractor locations. Activities, or documents ascertained to be noncompliant with quality assurance requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the Task Manager.

Personnel assigned to quality assurance functions will have the responsibility to issue and control Corrective Action Request (CAR) Forms (Figure 12.1 or similar). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered. The CAR is issued to the personnel responsible for the affected item or activity. A copy is also submitted to the Project Manager. The individual to whom the CAR is addressed returns the requested response promptly to the QA personnel, affixing his/her signature and date to the corrective action block, after stating the cause of the conditions and corrective action to be taken. The QA personnel maintain the log for status of CARs, confirms the adequacy of the intended corrective action, and verifies its implementation. CARs will be retained in the project file for the records.

Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The Project Manager will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

FIGURE 12.1

CORRECTIVE ACTION REQUEST

Number: _____ Date: _____

TO: _____

You are hereby requested to take corrective actions indicated below and as otherwise determined by you to (a) resolve the noted condition and (b) to prevent it from recurring. Your written response is to be returned to the project quality assurance manager by _____

CONDITION:

REFERENCE DOCUMENTS:

RECOMMENDED CORRECTIVE ACTIONS:

_____ _____ _____ _____ _____ _____

Originator Date Approval Date Approval Date

RESPONSE

CAUSE OF CONDITION

CORRECTIVE ACTION

(A) RESOLUTION

(B) PREVENTION

(C) AFFECTED DOCUMENTS

C.A. FOLLOWUP:

CORRECTIVE ACTION VERIFIED BY: _____ DATE:_____

SECTION 13

REFERENCES

USEPA, 1986. SW-846 "Test Method for Evaluating Solid Waste," dated November 1986. U.S. Environmental Protection Agency, Washington, D.C.

Taylor, J. K., 1987. Quality Assurance of Chemical Measurements. Lewis Publishers, Inc., Chelsea, Michigan

USEPA, 1987. Data Quality Objectives for Remedial Response Actions Activities: Development Process, EPA/540/G-87/003, OSWER Directive 9355.0-7- U.S. Environmental Protection Agency, Washington, D.C.

USEPA, 1992a. CLP Organics Data Review and Preliminary Review. SOP No. HW-6, Revision #8, dated January 1992. USEPA Region II.

USEPA, 1992b. Evaluation of Metals Data for the Contract Laboratory Program (CLP) based on SOW 3/90. SOP No. HW-2, Revision XI, dated January 1992. USEPA Region II.

APPENDIX I

SITE MANAGEMENT FORMS

Summary of Green Remediation Metrics for Site Management

Site Name: _____ Site Code: _____
Address: _____ City: _____
State: _____ Zip Code: _____ County: _____

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: _____

Current Reporting Period
Reporting Period From: _____ To: _____

Contact Information
Preparer's Name: _____ Phone No.: _____
Preparer's Affiliation: _____

I. Energy Usage: Quantify the amount of energy used directly on-site for remediation or as a result of requirements of the SMP and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site as part of the remediation or due to requirements of the SMP (e.g., soil generated during site development and disposed of off-site due to SMP requirements).

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste required for the remediation or otherwise due to requirements of the SMP.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site for remediation or SMP requirements from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

COVER SYSTEM INSPECTION FORM
FORMER BROWN MANUFACTURING SITE

Inspector: _____ Date: _____

Event Type (circle one): Scheduled / Non-Routine

Site Use Inspection
Is site use consistent with Environmental Easement?

Sidewalk Inspection
Please note any observations of breaches in any concrete/sidewalks, which may include but are not limited to cracks, holes, indentations, vegetation growing through concrete etc.

Soil Inspection
Please note any observations of breaches in the soil cover, which may include but are not limited to holes and soil washout. Include a sketch identifying the location of defects. Is there evidence of any excavations? Describe and include a sketch of areas of disturbance.

Have any of the areas noted in Section 4.2 of the Site Management Plan Addendum dated July 2018 been disturbed? Are any of the areas noted in Section 4.2 of the Site Management Plan Addendum dated July 2018 now accessible for construction of a cover system?

GROUNDWATER SAMPLING RECORD

SITE NAME: _____
PROJECT NUMBER: _____

SAMPLE NUMBER: _____ WEATHER: _____
DATE: _____ TIME: _____

SAMPLERS: _____ of _____
_____ of _____

DESCRIPTION OF SAMPLING POINT
Sample Location: Monitoring well MW- _____
Screen/Sample Depth: _____
Sampling Method: _____

GROUNDWATER PURGING
Initial Static Water Level: _____
One Well Volume: 3 Volumes
2-Inch Casing: ____ Feet of Water x 0.16 Gallons/Foot = ____ Gallons _____
3-Inch Casing: ____ Feet of Water x 0.36 Gallons/Foot = ____ Gallons _____
4-Inch Casing: ____ Feet of Water x 0.65 Gallons/Foot = ____ Gallons _____

Volume of groundwater purged: _____ Gallons
Purging Device: _____
Purge Water Disposition (e.g., contained): _____

SAMPLE DESCRIPTION
Color: _____
Odor: _____
Other: _____
Sample Analyzed for: _____
QC Samples at this Location: _____
QC Samples Analyzed for: _____

FIELD MEASUREMENTS
Temperature (C/F): _____ Dissolved Oxygen: _____
pH: _____ Eh (Redox Potential): _____
Conductivity (µohms/cm): _____
Turbidity (NTU): _____

SAMPLE CUSTODY
Chain of Custody Number: _____ Laboratory: _____
Shipped Via: _____ Airbill Number: _____

COMMENTS _____
_____

APPENDIX J
FLOOD PLAIN ANALYSIS

OBG

FINAL REPORT

Former Brown Manufacturing Site Floodplain Analysis

PARSONS

October 2016

OCTOBER 21, 2016 | 8653 | 62955

Former Brown Manufacturing Site Floodplain Analysis

Prepared for:

PARSONS

DOUGLAS M. CRAWFORD, PE
O'Brien & Gere Engineers, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

1. PROJECT BACKGROUND AND OBJECTIVES

The Former Brown Manufacturing Site (the site) is an approximately 1-acre vacant lot located in Syracuse, New York situated on the southeast corner of the intersection of Chester Street and Bellevue Avenue. The site location is shown in Figure 1. Prior activities conducted at the site have resulted in impacts to soil. A remedial design has been developed by Parsons that includes site grading and installation of a soil cover.

The site is located approximately 750-ft from Onondaga Creek. Based on the currently effective Flood Insurance Rate Maps (FIRMs) developed in 1986, the site is not located within the 100-year floodplain or the floodway associated with Onondaga Creek. The Federal Emergency Management Agency (FEMA) is updating the flood study and associated FIRMs for Onondaga County, including Onondaga Creek. Final maps are anticipated to be issued in November 2016. A preliminary map dated May 2015 obtained by the NYSDEC shows the site being located within the 100-year floodplain but not within the floodways as shown in Figure 2.

Parsons has developed a remedial design for the site that, as noted above, includes a soil cover. The objective of this project is to evaluate the impact of the site grading and the cover on the floodplain boundary and flood elevations in the vicinity of the site. Two alternatives were evaluated. Alternative 1 would raise the ground elevation on site by up to approximately 0.75-ft. Alternative 2 would raise the ground elevation on site by up to approximately 2-ft. Based on preliminary discussions with the City of Syracuse, meeting the substantive requirements of a floodplain development permit is not anticipated. However, this evaluation has been performed in the event the need for a permit arises during the design and review process.

2. SUMMARY OF FLOODPLAIN ANALYSIS

FEMA utilized the United States Army Corps of Engineers Hydraulic Engineering Center - River Analysis System (HEC-RAS) model version 4.1 to update the Onondaga Creek flood study. OBG obtained the current HEC-RAS model developed by FEMA for Onondaga Creek that is scheduled to go into effect on November 4, 2016. The model was utilized for the development of the baseline (existing conditions) and the alternative scenario hydrologic models for this project. Output from the HEC-RAS model was used as input to the United States Army Corps of Engineers HEC-GeoRAS software to generate a corresponding flood boundary for the area of interest.

HEC-GeoRAS is a set of procedures, tools, and utilities for processing geospatial data in ArcGIS using a graphical user interface (GUI). The interface allows the preparation of geometric data for import into HEC-RAS and processes simulation results exported from HEC-RAS. Based on HEC-RAS output, HEC-GeoRAS can be used to generate inundation maps for an associated stream reach. Water surface elevation (WSE) is calculated with respect to user-defined terrain elevation data. OBG obtained hydrologically adjusted high resolution digital elevation model (HDEM) from FEMA as developed by URS for Onondaga County[1]. The HDEM is a LiDAR based elevation model processed to represent hydrologic conditions for an area. The spatial resolution of the HDEM raster file used in this project was approximately 9 x 9 feet.

2.1 HEC-RAS MODEL DESCRIPTION

The FEMA-developed HEC-RAS model covers approximately 8.3 miles of Onondaga Creek between the Nedrow, NY area (upstream) and Onondaga Lake (downstream). OBG previously performed a detailed review of FEMA's Onondaga Creek HEC-RAS model associated with their revised preliminary flood insurance rate maps (FIRMS) dated June 29, 2012 as part of the Onondaga Creek Flood and Sediment Study that was completed for the Dormitory Authority of the State of New York (DASNY) in June 2016. A summary of boundary conditions and flow rate inputs are provided below.

[1] *Topographic Data Development for Detailed Study Streams*. Technical Support Data Notebook for Onondaga County, NY, URS Corporation, July 30, 2007

The cross sections geometry, bridges and culvert characteristics, Manning 'n' values and flow conditions were provided as internal to the FEMA-developed HEC-RAS model and were utilized by OBG without modification. The flow conditions for the 100-year flood water surface profile were simulated using discharge values summarized in Table 1.

Table 1: Steady Flow Data

River	River Cross Section	100-year flood discharge (cfs)
Onondaga Creek	43665	3400
	37090	3650
	27476	3840
	21450	4040
	15356	4300

The layout of the model together with the associated cross sections is presented in Figure 3.

2.2 MODELING APPROACH

The spacing of the HEC-RAS model cross sections is uniform along the creek's length (as seen in Figure 3) and as such, provides limited representation of the geometric details in the vicinity of the site. The 'existing conditions' model, together with the underlying digital elevation model in the section of the creek where the site is located are presented in Figure 4. To evaluate the proposed modifications of the site grading, OBG undertook the following modeling approach:

1. Developed an enhanced HEC-RAS model by adding additional cross sections in the area where the site is located. Additional cross sections more accurately represented the geometric character of the proposed site modification. After the enhanced model was developed, it was compared to the existing conditions model to examine if adding additional cross sections affects the water surface elevation (WES) in the site's vicinity.
2. Modified the enhanced HEC-RAS model by adjusting cross sections to reflect the proposed grade associated with Alternative 1 and Alternative 2.
    a. Alternative 1: The enhanced HEC-RAS model was modified by adjusting cross sections geometry to reflect proposed grade modification on site by approximately1-ft.
    b. Alternative 2: The enhanced HEC-RAS model was further modified to reflect grade modification by up to 2-ft.
3. Utilize HEC-RAS model output with the HEC-GeoRAS module to generate the 100-year flood inundation maps for Onondaga Creek for the 'existing conditions' model and the two proposed alternatives.

2.3 ENHANCED HEC-RAS MODEL

The layout and cross sections of the FEMA-provided HEC-RAS model in the area where the site is located can be seen in Figure 4. In its original configuration, the site is represented by a single cross section (cross section number 17004). To better represent the proposed changes to the site topography, additional cross sections were added to the model (see Figure 5 for additional cross sections layout). The interpolated cross sections were adjusted to the existing terrain geometry using local terrain information from a hydrologically corrected digital elevation model (HDEM).

Additional cross sections added to the model resulted in an enhanced existing conditions water surface elevation in the vicinity of the site and the corresponding 100-year flood boundary which can be seen in Figure 6 (water surface elevation (WSE) at cross section 17004), Figure 7 (WSE profile for the section of the creek) and

Figure 8 (HEC-GeoRAS generated 100-year flood boundary). As presented in Figure 6, the enhanced model resulted in a change in local WSE compared to the FEMA (existing conditions) model by approximately 0.05-ft or about 0.6-inch which can be explained by the model capturing some additional variations in the terrain for the section. The change in water surface elevation and the 100-year flood boundary for Alternatives 1 and 2 was evaluated with respect to the enhanced HEC-RAS model output and descriptions of these evaluations are provided below.

3. RESULTS

3.1 ALTERNATIVE 1

The proposed grade change associated with the remedial design was provided to OBG by Parsons and is provided in Figure 9. The soil cover would raise the existing ground on site by up to approximately 0.75-ft.

To reflect the proposed change, first the elevations in the HDEM were adjusted to values corresponding to the proposed grade change. Next, the modified HDEM was used as a reference to aid in modifying the corresponding cross sections stations in HEC-RAS. The adjusted HDEM is shown in Figure 10. The cross sections associated with the site (16682.7 through 17147.1) were consequently modified to match more closely the modified HDEM as shown in Figure 11 for cross section 17004.

The HEC-RAS model analysis was conducted for Alternative 1 and the results were used as input to the HEC-GeoRAS module to generate a corresponding 100-year flood boundary. The change in the water surface elevation resulting from the proposed grade change was minimal and is anticipated to be approximately 1.3 inches at cross section 16591 as shown in Figure 12. The proposed change results in negligible changes in the 100-year flood boundary in the site's vicinity as shown in Figure 13.

3.2 ALTERNATIVE 2

The Alternative 2 scenario involved changing the site grade by up to 2-ft. Similar to Alternative 1, the HDEM was modified by raising the ground elevation on site to reflect the proposed grade change. After adjusting cross sections in the HEC-RAS model as shown in Figure 11, HEC-GeoRAS was used to generate the corresponding 100-year flood inundation boundary for the area. The change in the water surface elevation resulting from the proposed grade change was once again minimal and is observed to be approximately 1.4 inches at cross section 16591 as shown in Figure 14. The proposed change results in negligible changes in the 100-year flood boundary in the site's vicinity as shown in Figure 15.

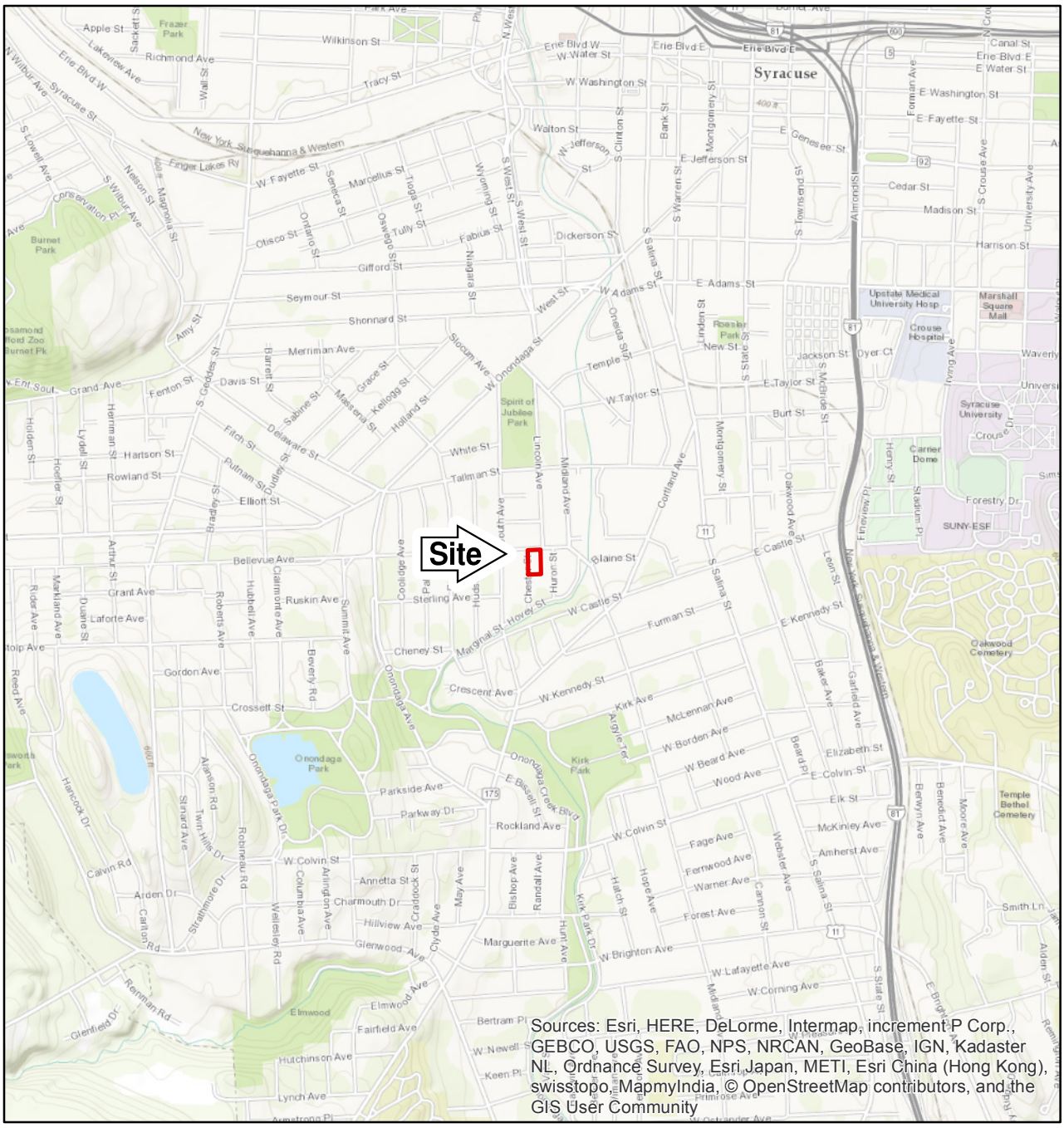
4. CONCLUSION

The objective of this work was to evaluate proposed changes in grading of the site and their impact on the water surface elevations for the FEMA 100-year flood boundary in the vicinity of the site. OBG conducted hydrologic simulations utilizing the FEMA-developed HEC-RAS model and adjusted the model to better represent the proposed grading change (Alternatives 1 and 2). The HEC-GeoRAS module was used to generate corresponding inundation maps for the area. As presented in this report, the proposed grading change resulted in changes in water surface elevation in the vicinity of the site that do not appear to materially affect the FEMA-developed preliminary floodplain boundaries due to minimal (approximately 1.3-1.4 inches) changes in calculated water surface elevation. Although the change in water surface elevation for both alternatives is essentially the same, Alternative 2 resulted in a change to WSE which extended longer in the upstream/downstream direction when compared to Alternative 1 and as noted in Figures 12 and 14.

Figures

FIGURE 1

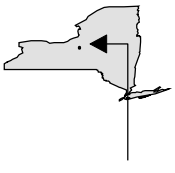
PLOTDATE: never never DomaszP



I:\Parsons-Eng.8653\62955.Brown-Mfg-Remed\Docs\DWG\MXD\SiteMap.mxd

ADAPTED FROM: SYRACUSE WEST, NEW YORK USGS QUADRANGLE

FORMER BROWN MANFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK



MAP LOCATION

N

SITE LOCATION

0 600 1,200 2,400

Feet

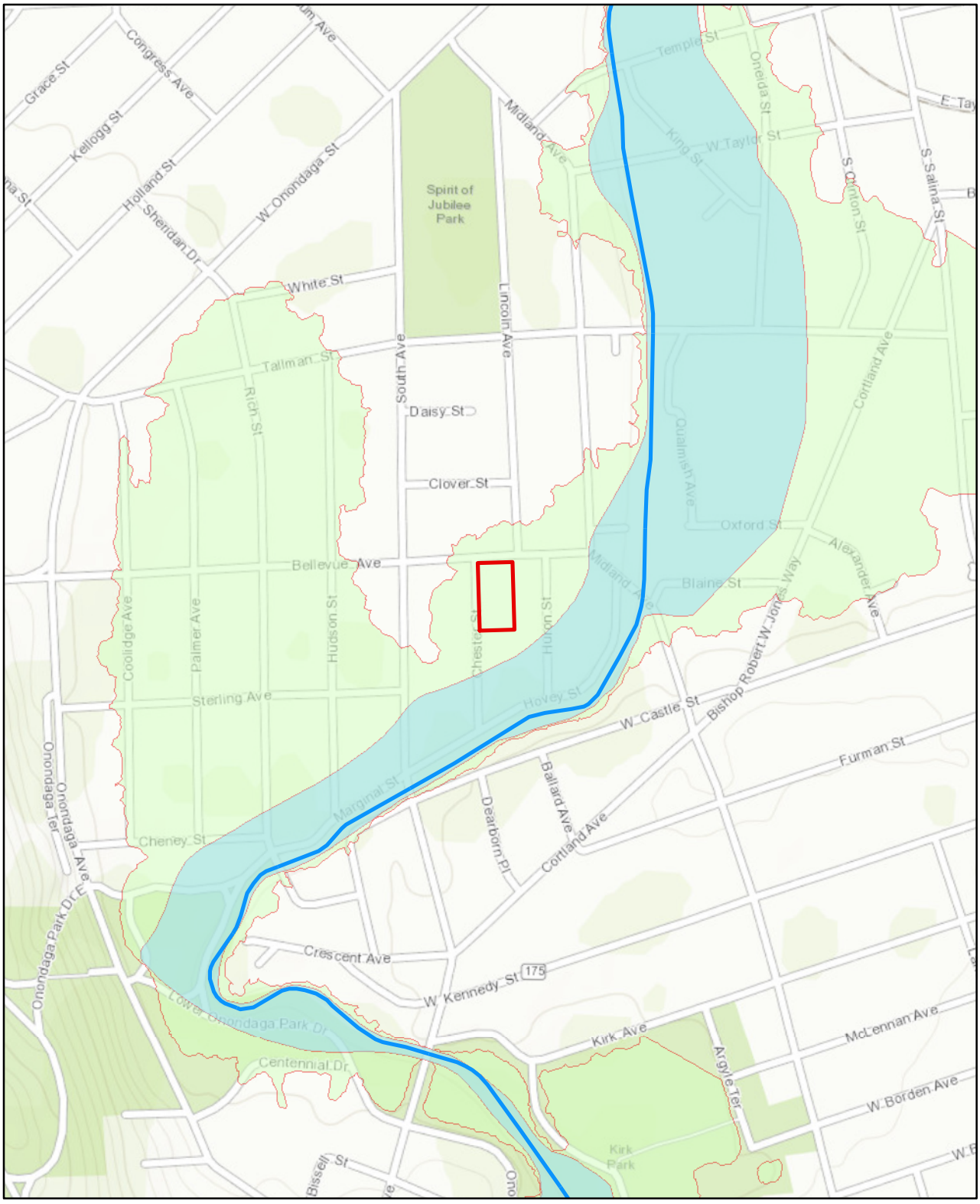
8653.62955
SEPTEMBER 2016

1:24,000

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 2

PLOTDATE: never never DomaszP



I:\Parsons-Eng.8653\62955.Brown-Mfg-Remed\Docs\DWG\MXD\SiteZOOM.mxd

LEGEND

- ONONDAGA CREEK
- SITE LOCATION
- FEMA 100-YEAR FLOOD ZONE
- FEMA FLOODWAY

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

SITE OVERVIEW

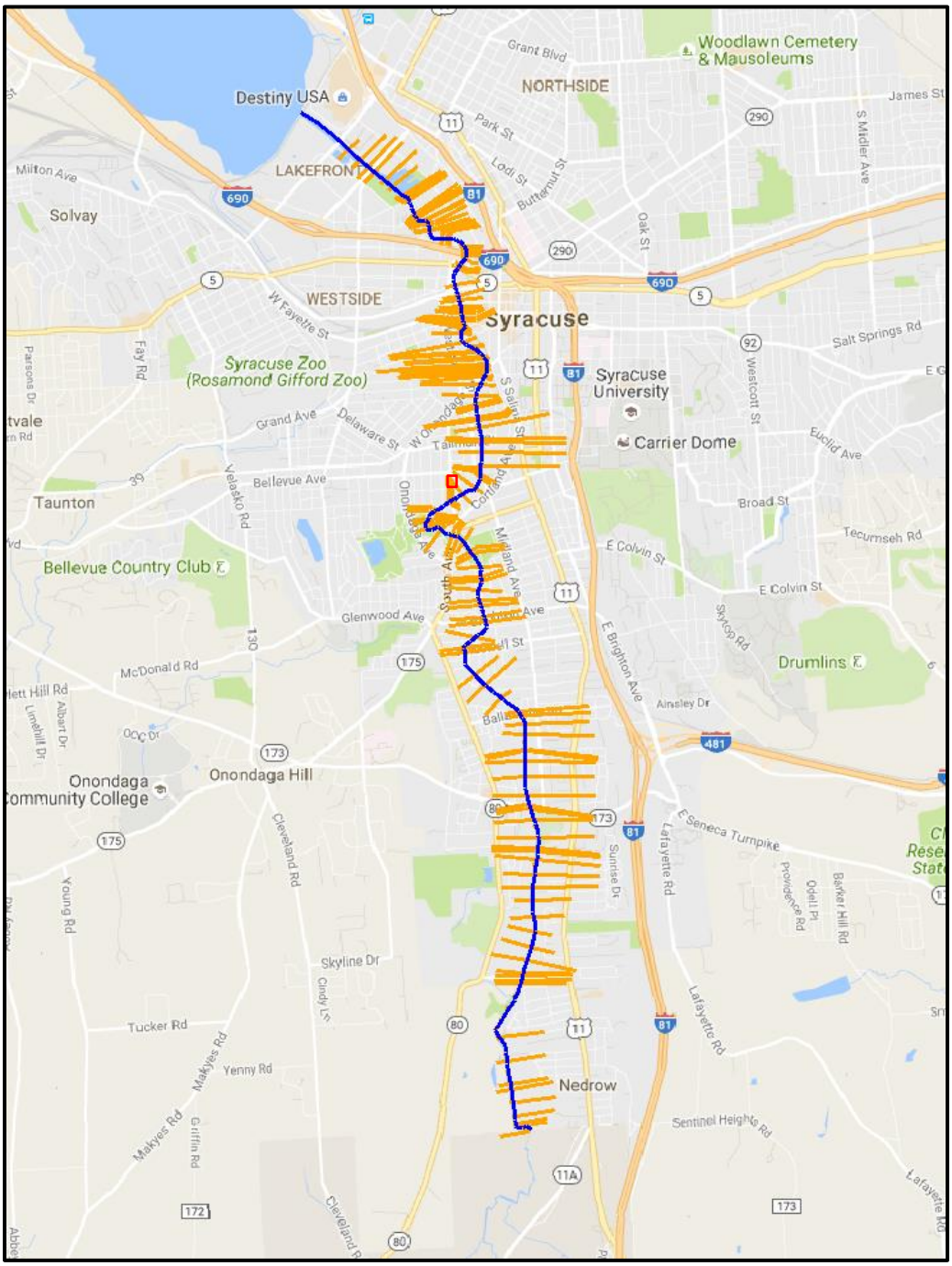
N

0 400 800 1,600
Feet

8653.62955
SEPTEMBER 2016

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 3



LEGEND

- ONODAGA CREEK
- MODEL CROSS SECTION
- SITE LOCATION

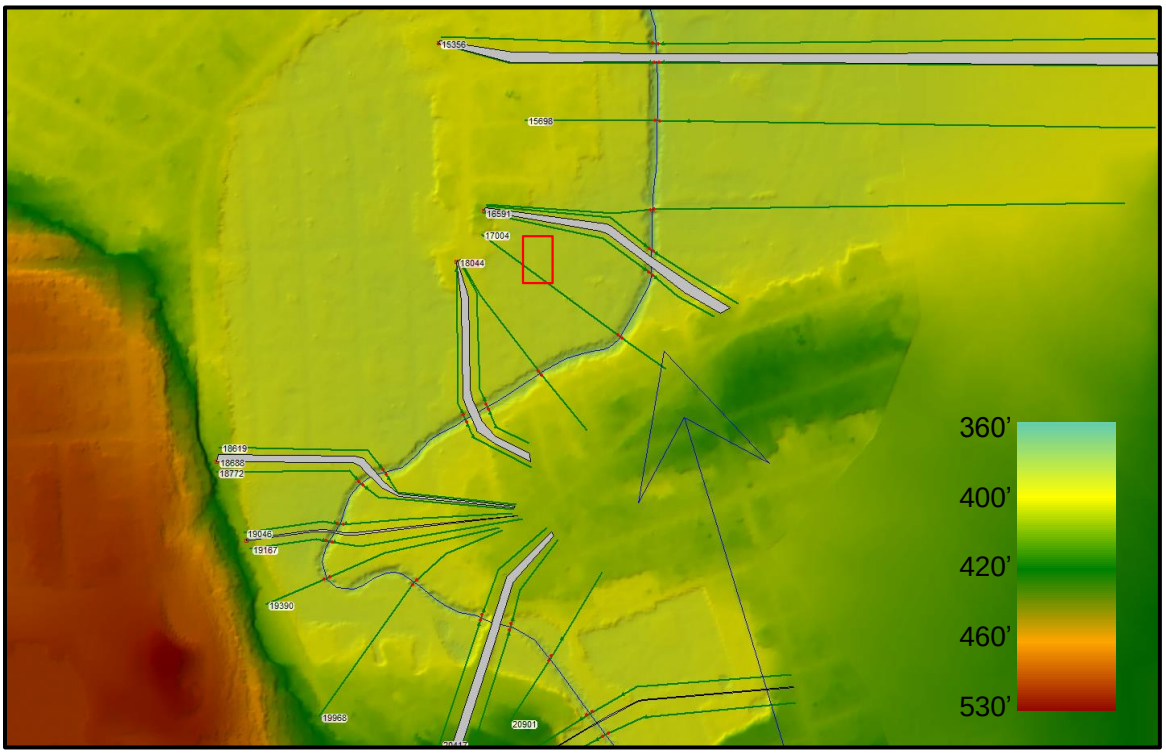
FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

HEC-RAS MODEL LAYOUT

N

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 4



LEGEND

- ONODAGA CREEK
- MODEL CROSS SECTION
- SITE LOCATION
- BRIDGE SECTION

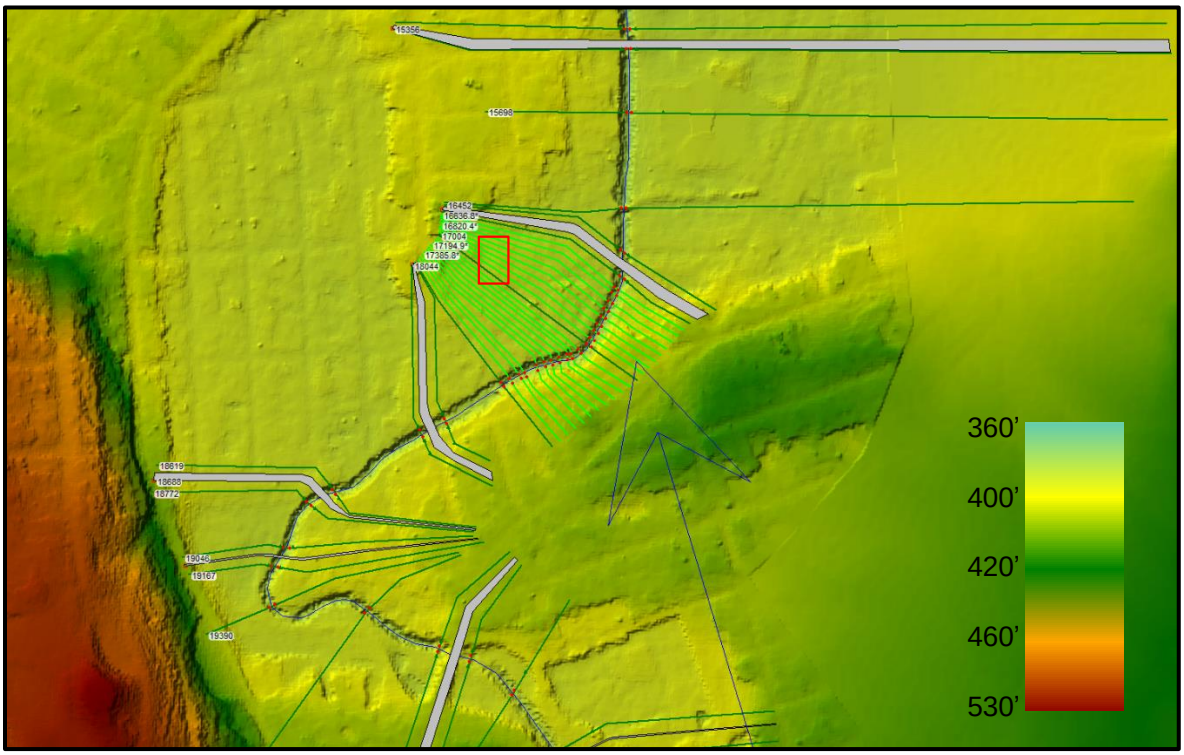
FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

EXISTING CONDITION
DIGITAL ELEVATION MODEL

N

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 5



LEGEND

- ONODAGA CREEK
- MODEL CROSS SECTION
- SITE LOCATION
- ADDITIONAL CROSS SECTIONS
- BRIDGE SECTION

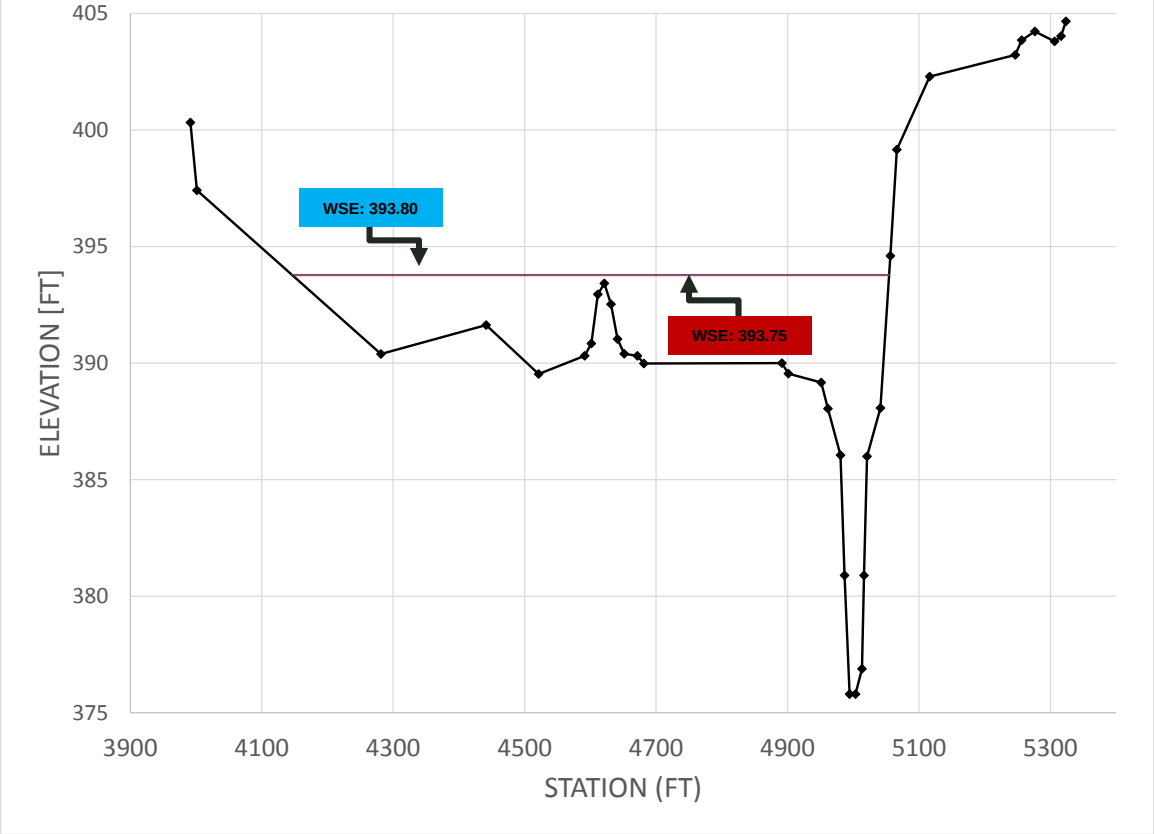
FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

LOCATIONS OF ADDITIONAL CROSS SECTIONS

N

O’BRIEN & GERE ENGINEERS, INC.

FIGURE 6



LEGEND

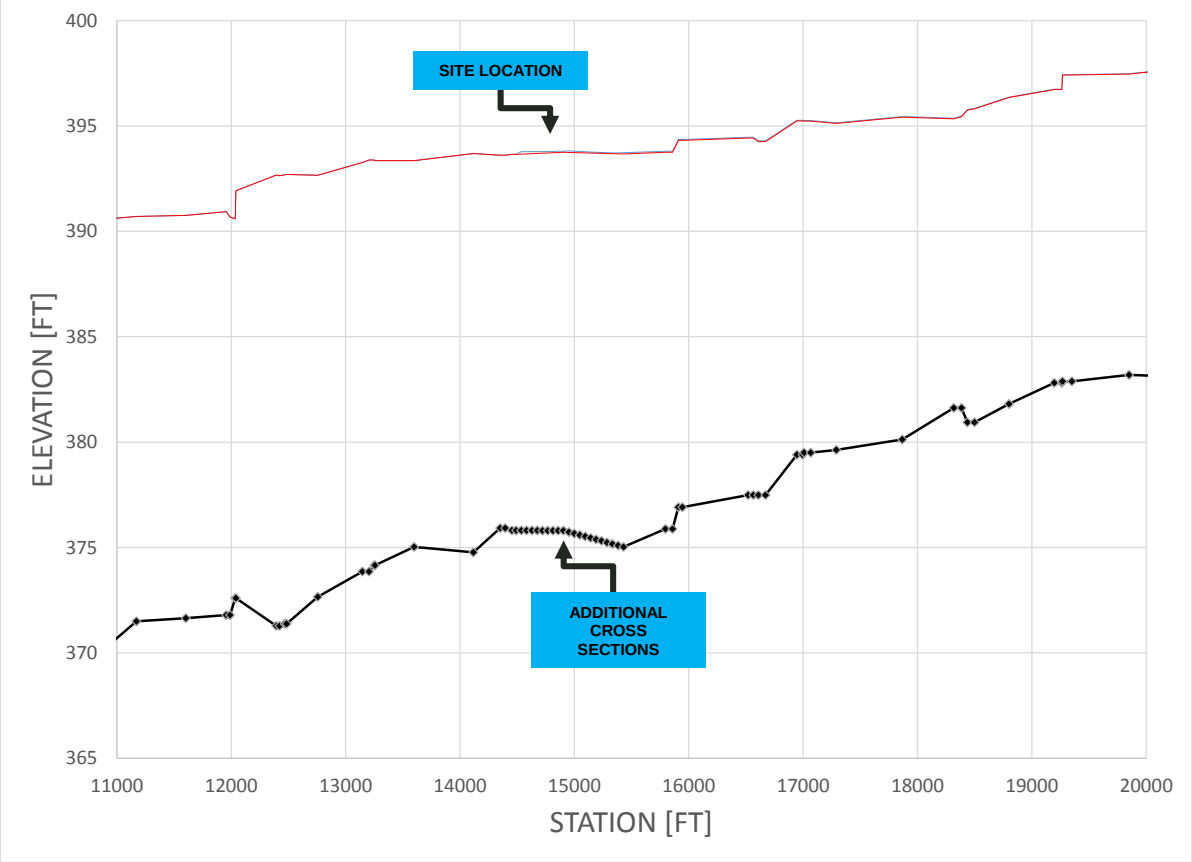
- GROUND SURFACE
- WATER SURFACE ELEVATION - FEMA MODEL
- WATER SURFACE ELEVATION - ENHANCED MODEL

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

COMPARISON OF EXISTING CONDITIONS MODEL AND ENHANCED MODEL WATER SURFACE ELEVATIONS AT CROSS SECTION 17004 (100-YEAR FLOOD)

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 7



LEGEND

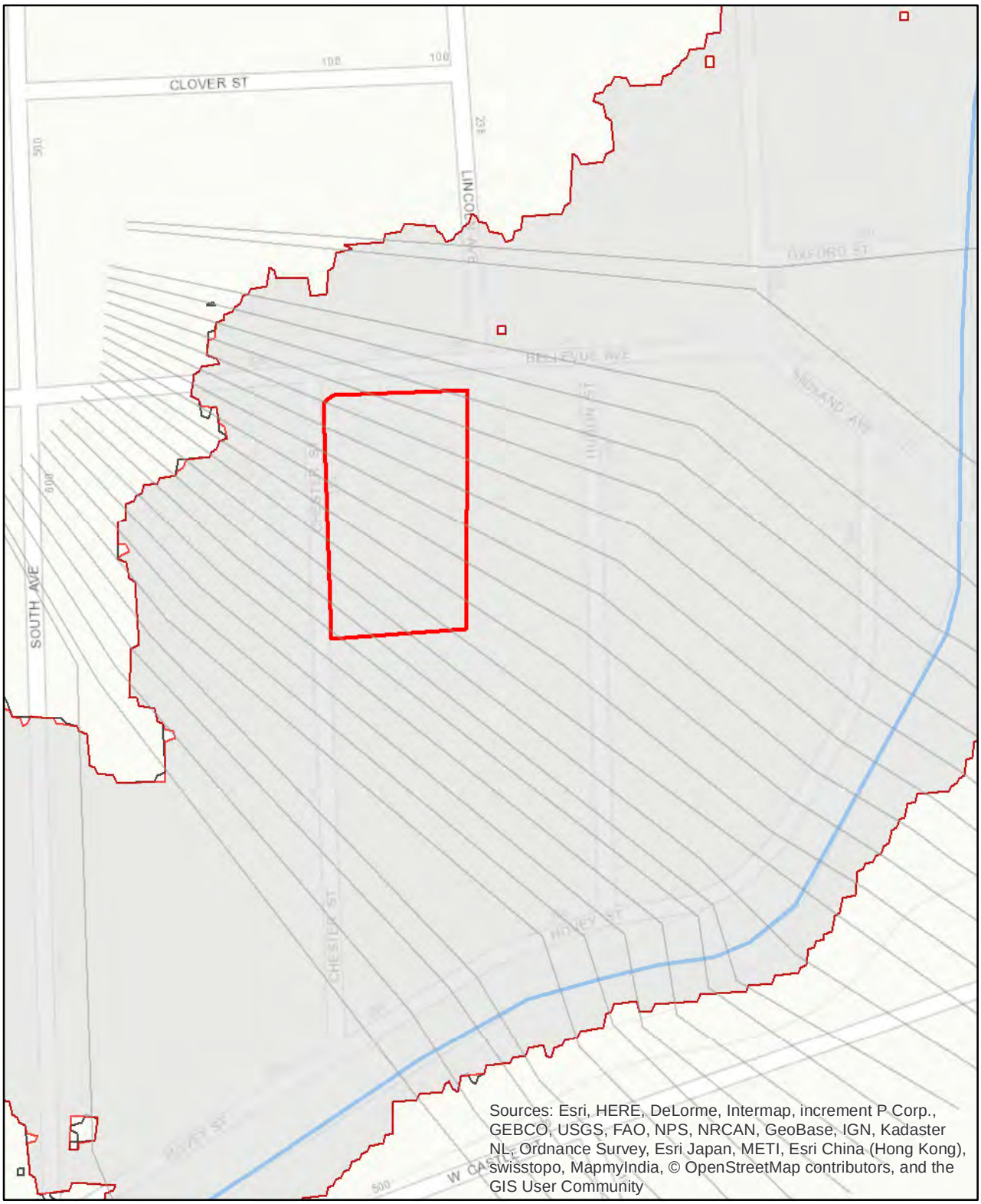
- GROUND SURFACE
- WATER SURFACE ELEVATION - FEMA MODEL
- WATER SURFACE ELEVATION - ENHANCED MODEL

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

COMPARISON OF EXISTING CONDITIONS MODEL AND ENHANCED MODEL WATER SURFACE ELEVATIONS PROFILE (100-YEAR FLOOD)

O'BRIEN & GERE ENGINEERS, INC.

PLOTDATE: never never DomaszP



I:\Parsons-Eng.8653\62955.Brown-Mfg-Remed\Docs\DWG\MXD\SummaryFIGURE.mxd

LEGEND

- CROSS SECTIONS
- SITE LOCATION
- EXISTING CONDITIONS MODEL
- ENHANCED MODEL

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

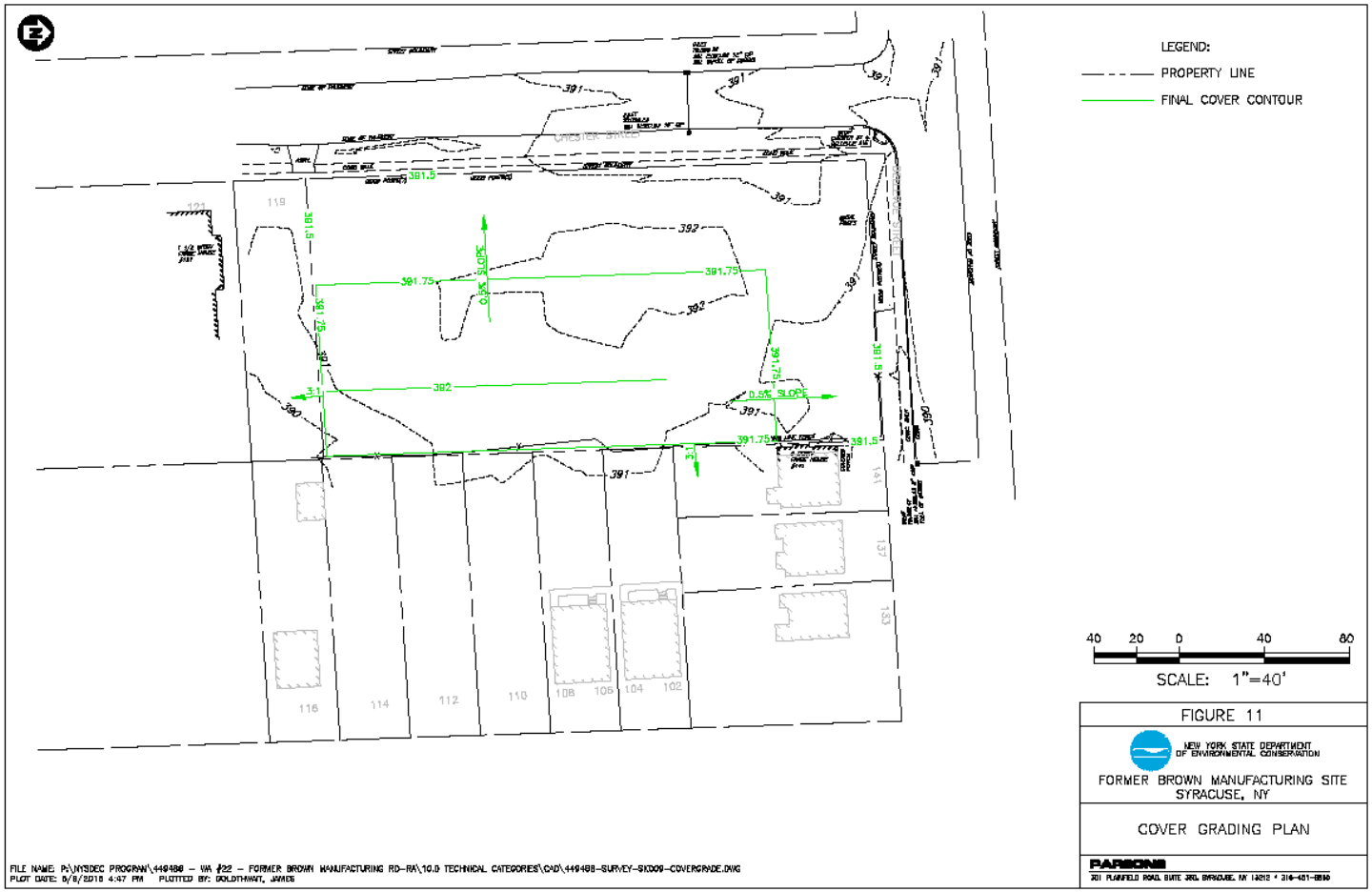
N

100-YEAR FLOODPLAIN BOUNDARY
EXISTING CONDITIONS VS. ENHANCED MODEL

8653.62955
SEPTEMBER 2016

0 45 90 180 270 360
Feet

O'BRIEN & GERE ENGINEERS, INC.

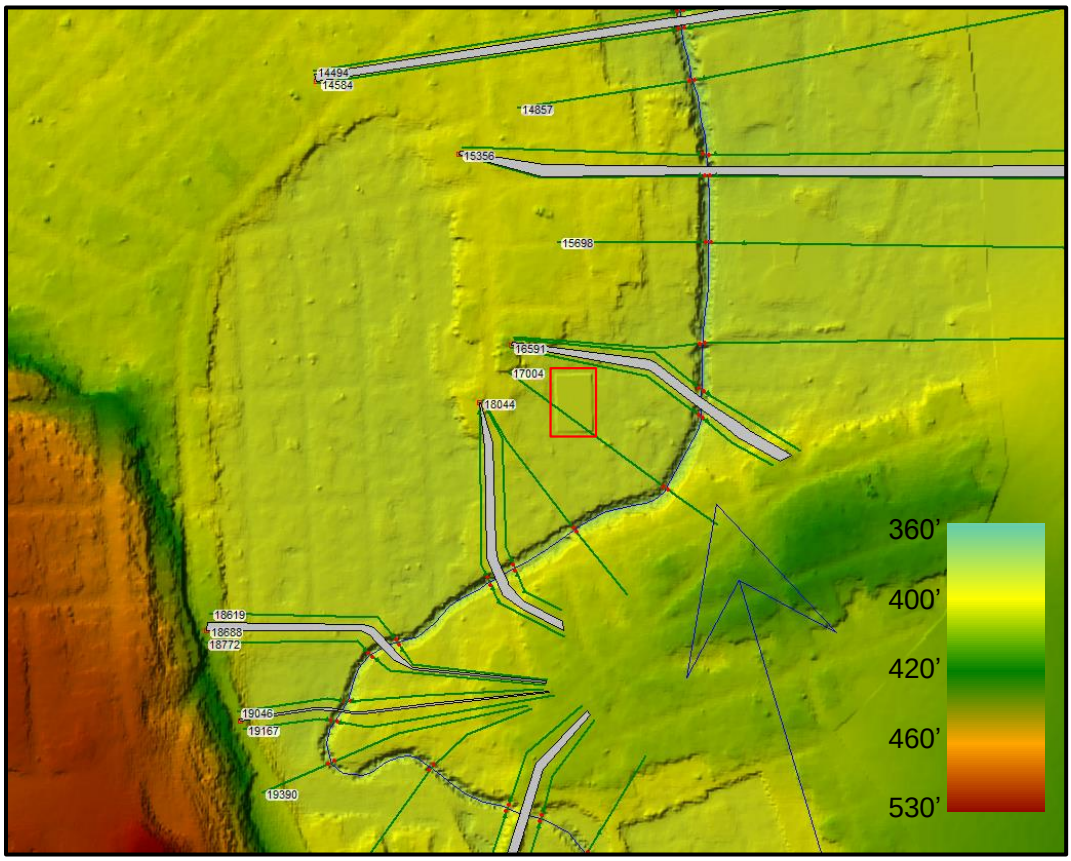


FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

COVER GRADING PLAN

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 10



LEGEND

- ONONDAGA CREEK
- MODEL CROSS SECTIONS
- SITE LOACTION
- BRIDGE SECTION

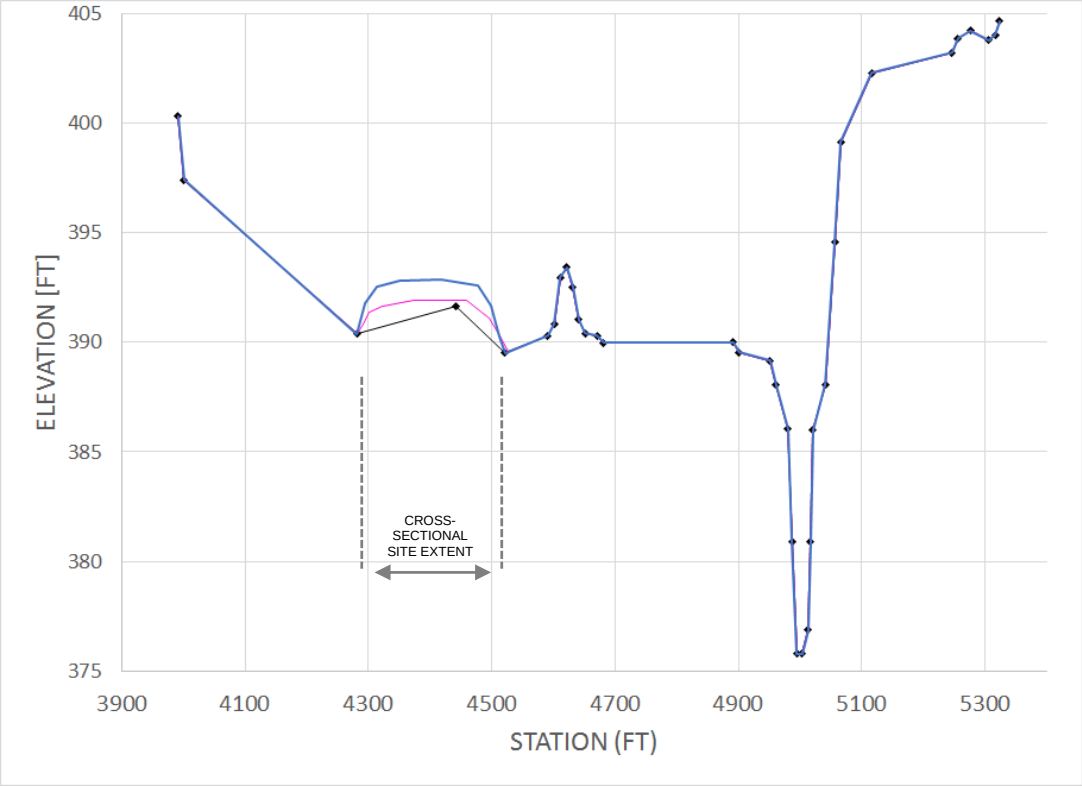
FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

ALTERNATIVE 1
SITE GRADE

N

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 11



LEGEND

EXISTING CONDITIONS CROSS SECTION

ALTERNATIVE 1 CROSS SECTION

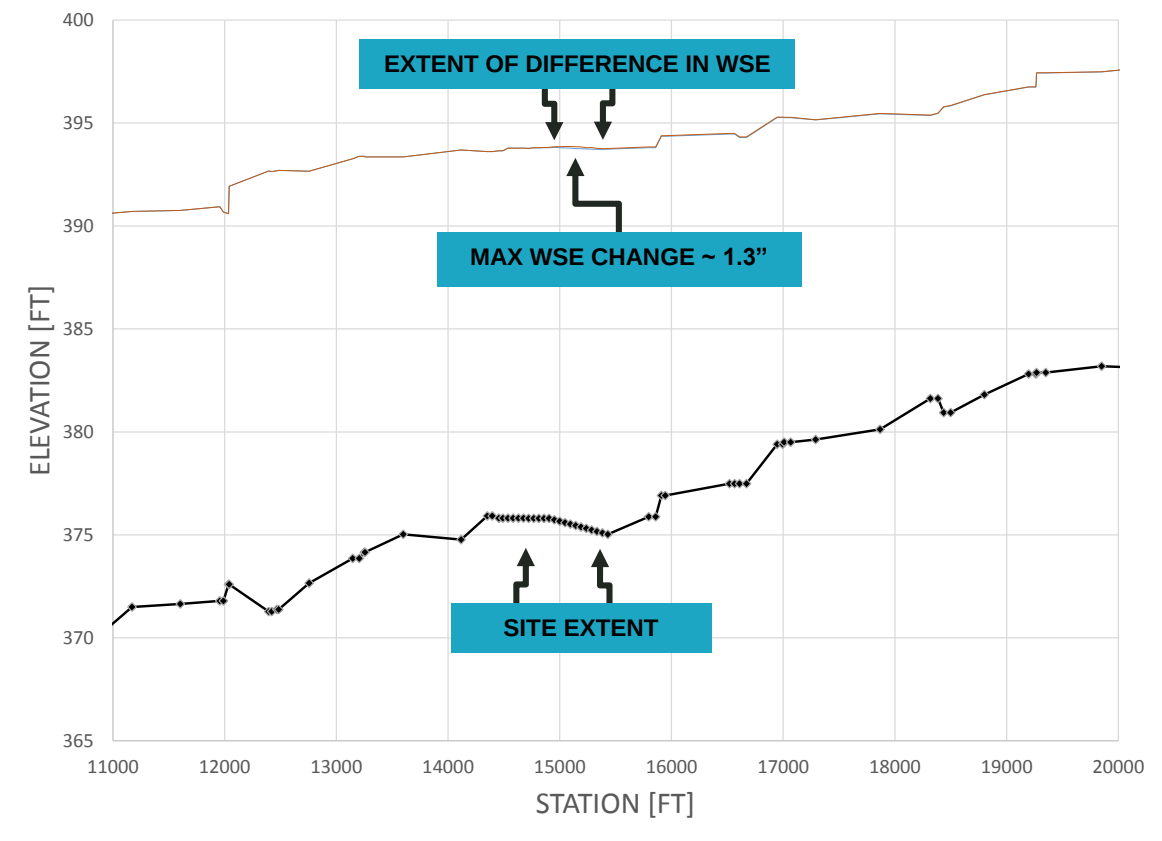
ALTERNATIVE 2 CROSS SECTION

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

CROSS SECTION COMPARISON EXISTING CONDITION VS. ALTERNATIVE 1 AND ALTERNATIVE 2

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 12



LEGEND

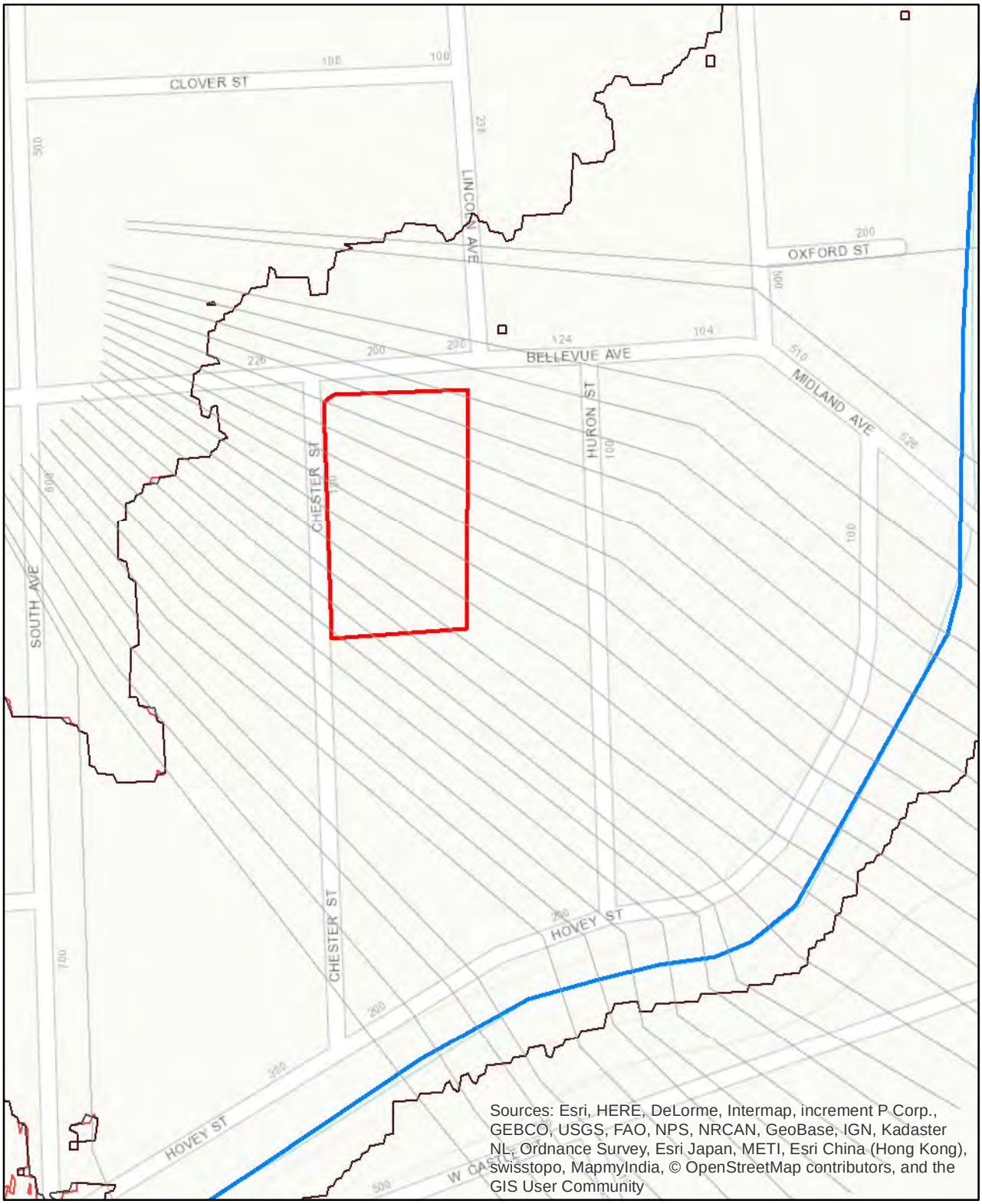
- CHANNEL BOTTOM
- ENHANCED CONDITION
- ALTERNATIVE 1

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

WATER SURFACE ELEVATION PROFILE
ENHANCED CONDITION VS. ALTERNATIVE 1

O'BRIEN & GERE ENGINEERS, INC.

PLOTDATE: never never DomaszP



I:\Parsons-Eng.8653\62955.Brown-Mfg-Remed\Docs\DWG\MXD\SummaryFIGURE.mxd

LEGEND

- CROSS SECTIONS
- SITE LOCATION
- ENHANCED MODEL
- ALTERNATIVE 1

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

100-YEAR FLOODPLAIN BOUNDARY
ENHANCED MODEL VS. ALTERNATIVE 1

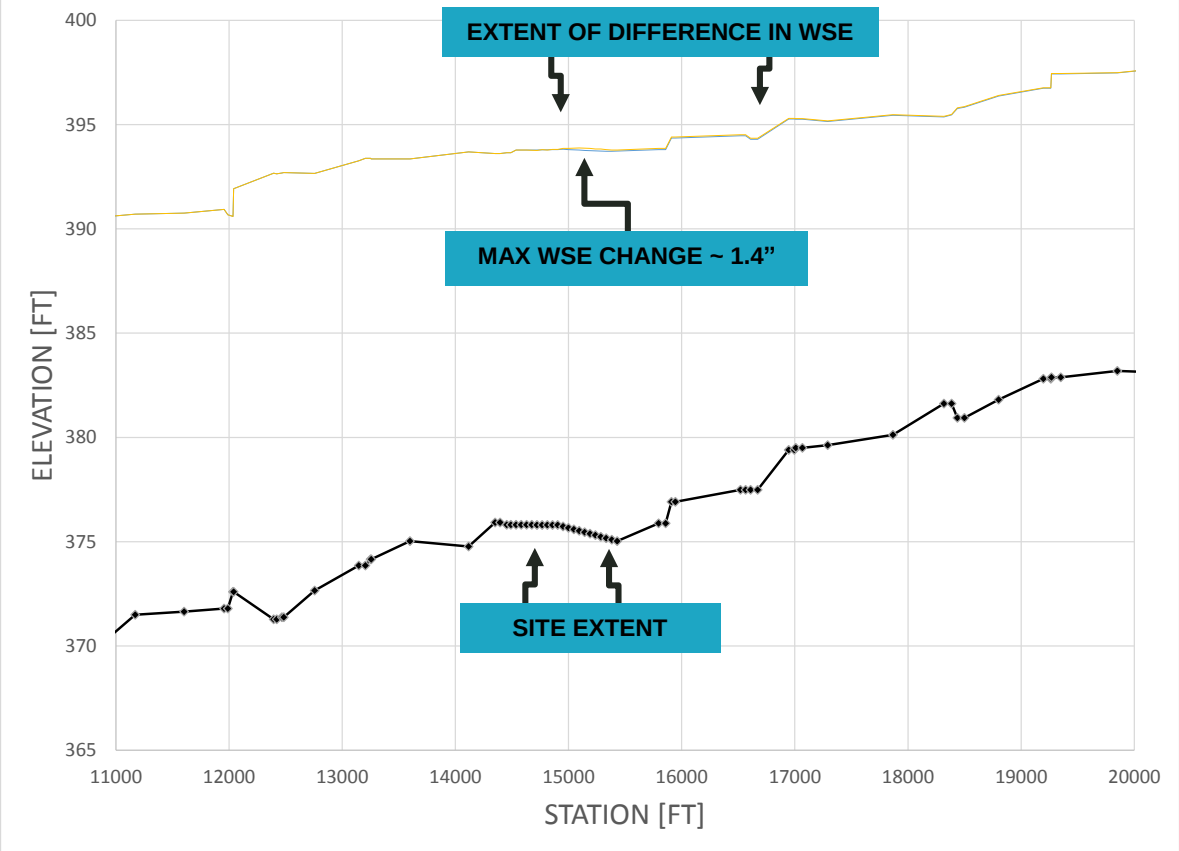
N

8653.62955
SEPTEMBER 2016

0 45 90 180 270 360
Feet

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 14



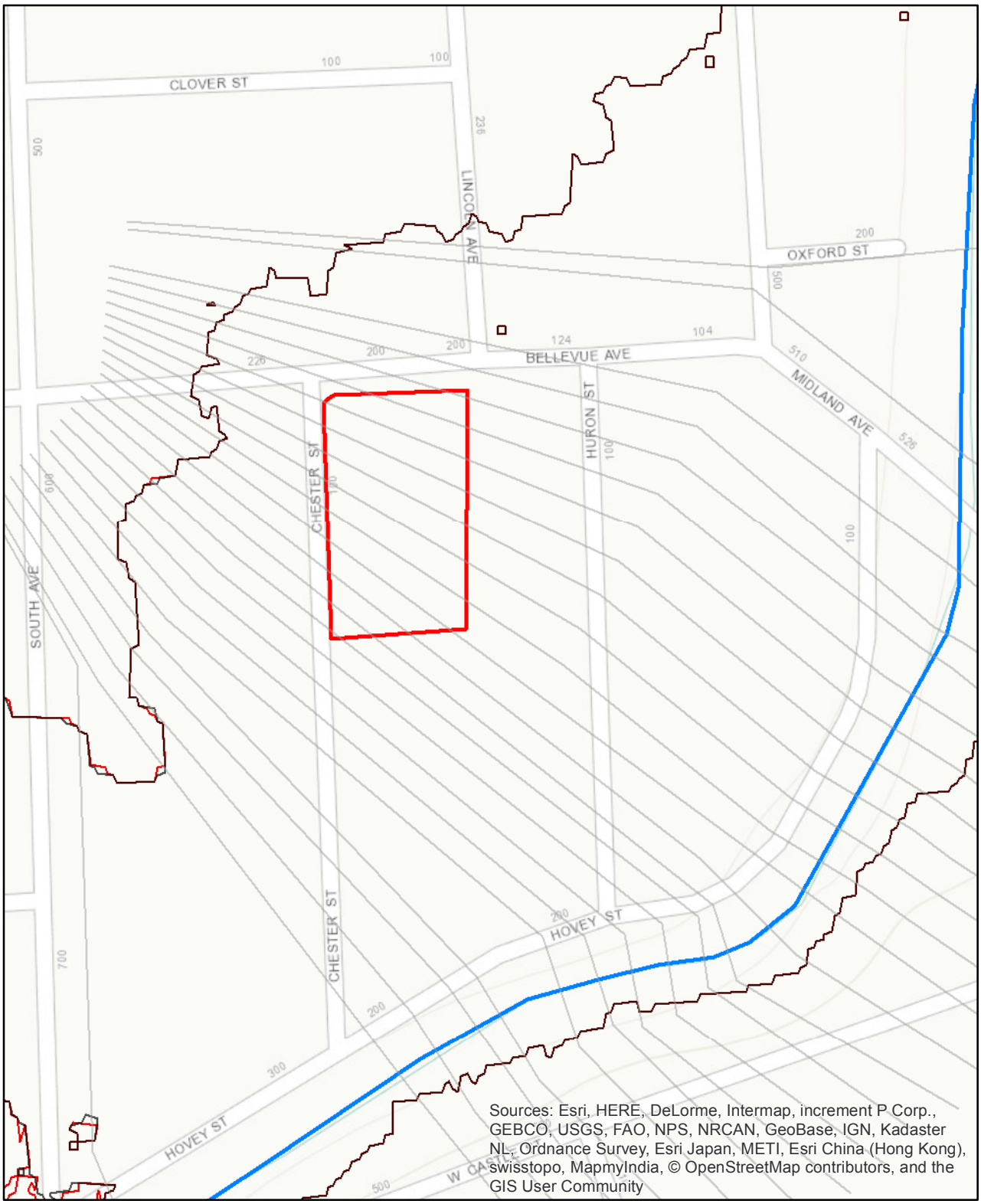
LEGEND

- CHANNEL BOTTOM
- ENHANCED CONDITION
- ALTERNATIVE 2

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

WATER SURFACE ELEVATION PROFILE
ENHANCED CONDITION VS. ALTERNATIVE 2

O'BRIEN & GERE ENGINEERS, INC.



PLOTDATE: never never DomaszP

I:\Parsons-Eng.8653\62955.Brown-Mfg-Remed\Docs\DWG\MXD\SummaryFIGURE.mxd

LEGEND

- CROSS SECTIONS
- SITE LOCATION
- ENHANCED MODEL
- ALTERNATIVE 2

FORMER BROWN MANUFACTURING SITE
FLOODPLAIN ANALYSIS
SYRACUSE, NEW YORK

100-YEAR FLOODPLAIN BOUNDARY
ENHANCED MODEL VS. ALTERNATIVE 2

N

8653.62955
SEPTEMBER 2016

0 45 90 180 270 360
Feet

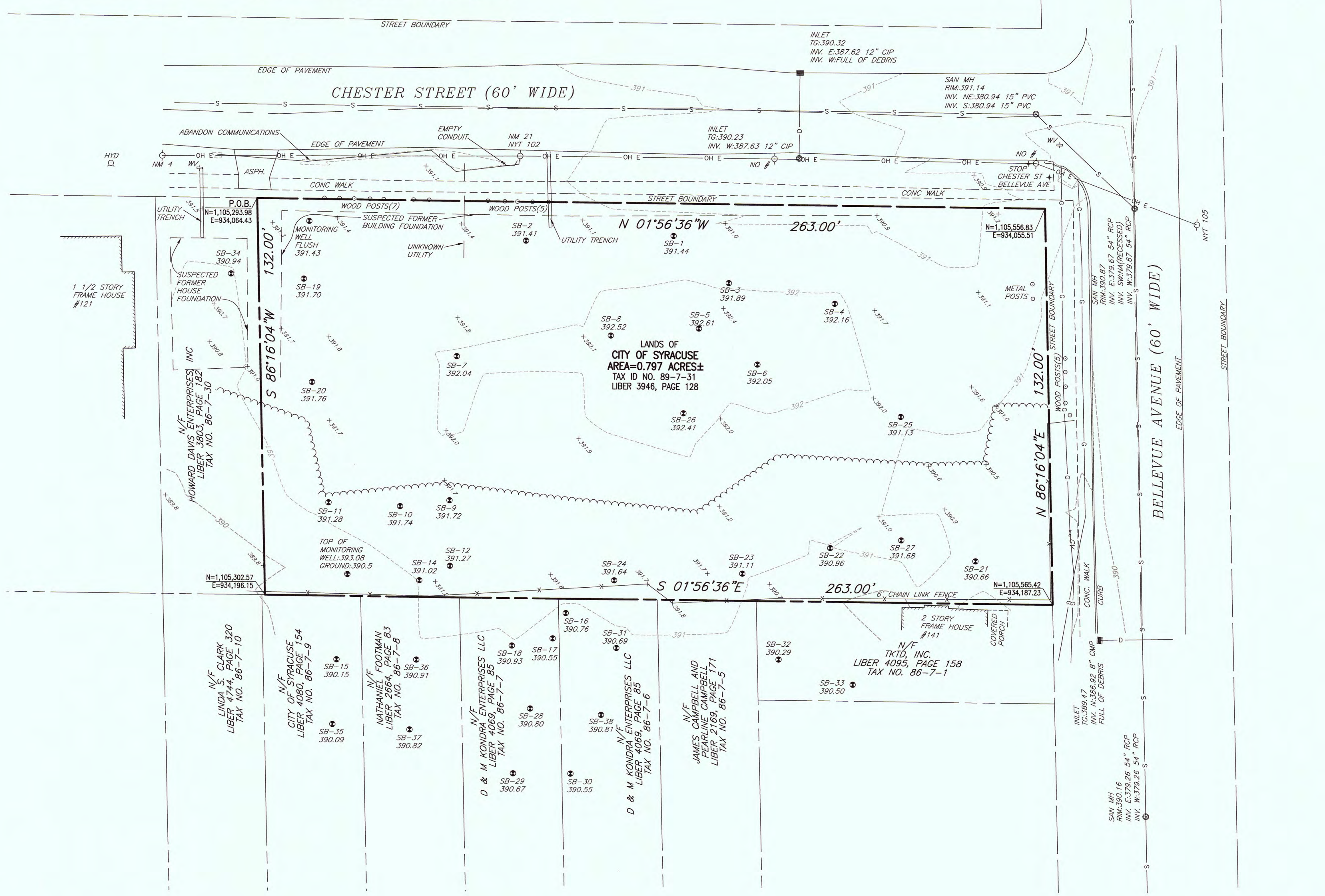
O'BRIEN & GERE ENGINEERS, INC.

APPENDIX K

SURVEY

THIS PROPERTY IS SUBJECT TO AN ENVIRONMENTAL EASEMENT HELD BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PURSUANT TO TITLE 36 OF ARTICLE 71 OF THE NEW YORK ENVIRONMENTAL CONSERVATION LAW.

THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THE EASEMENT ARE SET FORTH IN MORE DETAIL IN THE SITE MANAGEMENT PLAN ("SMP"). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. 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 OR AT derweb@gw.dec.state.ny.us.



LEGEND

- PROPERTY LINE/LEASE PARCEL LINE
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- BUILDING LINE
- FENCE LINE
- EDGE OF WATER, STREAM OR DITCH
- EDGE OF WOODS OR BRUSH
- S — SANITARY SEWER LINE W/MANHOLE & C.O.
- D — CULVERTS, STORM SEWER LINE W/MH & CATCH BASIN
- W — WATER LINE W/HYDRANT, VALVE & VAULT
- UG E — ELECTRIC LINE W/PULLBOX, METER & MANHOLE
- G — NATURAL GAS LINE W/METER & VALVE
- OH, OH E, OT, OC — OVERHEAD WIRES, ELECTRIC, TELEPHONE & CABLE LINE
- UG T — UNDERGROUND TELEPHONE LINE
- UG FO — UNDERGROUND FIBER OPTIC LINE
- ST — HEATING LINE (STEAM)
- TS Q — SIGNAL ARM/HEAD, SIGNAL POLE, PEDESTRIAN POLE & TRAFFIC PULL BOX
- TC — TRAFFIC CONTROL LINE
- UTILITY POLE, GUY, LIGHT POLE, WALK LIGHT & TOP MOUNT LIGHT
- WF 59 — WETLAND FLAG
- BORING LOCATION, MONITORING WELL

DESCRIPTION OF PREMISES:

ALL THAT TRACT OR PARCEL OF LAND CONTAINING 0.797 ACRES, MORE OR LESS, SITUATE IN THE 12TH WARD OF THE CITY OF SYRACUSE, ONONDAGA COUNTY, STATE OF NEW YORK, BEING MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE SOUTHERLY STREET BOUNDARY OF BELLEVUE AVENUE (60' WIDE) AT ITS INTERSECTION WITH THE EASTERLY STREET BOUNDARY OF CHESTER STREET (60' WIDE); THENCE

1) NORTH 86°16'04" EAST ALONG THE SAID SOUTHERLY STREET BOUNDARY OF BELLEVUE AVENUE, A DISTANCE OF 132.00 FEET TO A POINT; THENCE
2) SOUTH 01°56'36" EAST ALONG THE EASTERLY LANDS NOW OR FORMERLY OF THE CITY OF SYRACUSE, A DISTANCE OF 263.00 FEET TO A POINT; THENCE
3) SOUTH 86°16'04" WEST ALONG THE SOUTHERLY LANDS NOW OR FORMERLY OF THE CITY OF SYRACUSE, A DISTANCE OF 132.00 FEET TO A POINT IN THE SAID EASTERLY STREET BOUNDARY OF CHESTER STREET; THENCE
4) NORTH 01°56'36" WEST ALONG THE SAID EASTERLY STREET BOUNDARY OF CHESTER STREET, A DISTANCE OF 263.00 FEET TO THE POINT OF BEGINNING.

SUBJECT TO ANY EASEMENTS OR ENCUMBRANCES OF RECORD.

SURVEY NOTES:

1. COORDINATES AND NORTH ORIENTATION SHOWN HEREON ARE REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, TRANSVERSE MERCATOR PROJECTION, NAD 83 (2011) EPOCH 2010.00 USING GPS PROCEDURES AND THE NEW YORK STATE DOT CORS NETWORK.
2. ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (GEOID 12A) USING GPS PROCEDURES.
3. UNDERGROUND UTILITIES SHOWN HEREON WERE PLOTTED FROM VISIBLE EVIDENCE LOCATED AT THE TIME OF THE FIELD SURVEY AND DESIGNATIONS BY A SUBSURFACE UTILITY MARKING COMPANY. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOULD BE STAKED BY THE RESPECTIVE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.
4. THIS MAP WAS PREPARED WITHOUT THE BENEFIT OF AN ABSTRACT OF TITLE OR TITLE COMMITMENT.

WE: FISHER ASSOCIATES, P.E., L.S., L.A., D.P.C., HEREBY CERTIFY THAT THIS MAP WAS PREPARED OCTOBER 26, 2015 FROM NOTES OF AN INSTRUMENT SURVEY COMPLETED BY US ON OCTOBER 13, 2015 USING REFERENCES AND EVIDENCE SHOWN HEREON.

THIS MAP IS SUBJECT TO ANY EASEMENTS OR ENCUMBRANCES THAT AN ABSTRACT OF TITLE MAY SHOW.

BY: Scott V. Stitt DATE: March 24, 2016

20 0 20 40

SCALE: 1" = 20

FILE NAME: H:\Projects\152029-00-Former_Brown_Mnfg_Site\Sur\CAD\Former Brown Mfg Site.dwg
DATE/TIME: 3/24/2016 1:17:31 PM
USER: Mike Miller

REV	DESCRIPTION	DATE	BY
7			
6			
5			
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1	ADDED COORDINATES & P.O.B	1/7/16	SVS

FA PROJECT NO. 152029
PROJECT MANAGER S. SMITH
DRAWN BY M. MILLER
SCALE 1"=20'
ISSUE DATE 10/23/15

STATE OF NEW YORK — SCOTT V. STITT — LICENSED LAND SURVEYOR — 050...

FISHER ASSOCIATES
www.FISHERASSOC.COM

PROJECT
INVESTIGATION STUDY OF THE FORMER BROWN MFG. SITE
101 CHESTER STREET
NYSDEC SITE ID #B00024
CITY OF SYRACUSE, NEW YORK

TITLE OF DRAWING
TOPOGRAPHIC AND BOUNDARY SURVEY

DRAWING NO.
FA-1

SHEET 1 OF 1