Former National Plating Company, Inc.

ONONDAGA COUNTY

SYRACUSE, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: V00264

Prepared for:

D.J.H. Realty Corp.

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Prepared by:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
	June 2018	Original Submission	

JUNE 2018

CERTIFICATION STATEMENT

I, Dale R. Vollmer, certify that I am currently a NYS registered professional engineer 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).

Dale Vollmer P.E.

June 12, 2018 DATE

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AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
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
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
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
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
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
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

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

Site Identification: V00264 Former National Plating Company, Inc.

Institutional Controls:	1. The property may be used for restricted commercial use.	
	2. Environmental easement. All ICs as listed in Section 3.2 should be listed here.	
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.	
Engineering Controls:	1. Cover system	
	2. Sub-slab depressurization system.	
Inspections:		Frequency
1. Cover inspection		Annually, or following any severe weather event that may impact this EC.
Monitoring:		
1. Groundwater Monitoring Wells MW-2, MW-4 and MW-6		Annually, or at a frequency specified by NYSDEC.
Maintenance:		
1. Sub-slab depressurization fan maintenance		Annually, or following any event that may affect system performance.
Reporting:		
1. Groundwater Data		Annually
2. Periodic Review Report		Annually

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

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Former National Plating Company, Inc. 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) Voluntary Cleanup Program (VCP) Site No. V00264 which is administered by New York State Department of Environmental Conservation (NYSDEC).

D.J.H. Realty Corp. entered into a Voluntary Cleanup Agreement (VCA) in 2003 with the NYSDEC to remediate 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 D.

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 VCA (Site #00264) 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 A of this SMP.

This SMP was prepared by Plumley Engineering, P.C. on behalf of D.J.H. Realty Corp., in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 3, 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 VCA, 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 Voluntary Cleanup Agreement (VCA), and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 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 A.

Table 1: Notifications*

Name	Contact Information
Mr. Michael Belveg NYSDEC Project Manager	(315) 426-7446 Michael.Belveg@dec.ny.gov
Mr. Harry Warner NYSDEC Regional HW Engineer	(315) 426-7524 harry.warner@dec.ny.gov]
Kelly Lewandowski, Site Control Section Division of Environmental Remediation	(518) 402-9764 Kelly.lewandowski@dec.ny.gov

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

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in the Town of Salina, Onondaga County, New York and is identified as Section 073 Block 01 and Lot 04.0 on the Onondaga County Tax Map (see Figure 2). The site is an approximately one-acre area and is bounded by Paratore Signs to the north, the former Town of Salina landfill to the south and west, and Brewerton Road to the east (see Figure 2 – Site Layout Map). The boundaries of the site are more fully described in Appendix D –Environmental Easement. The owner of the site parcel at the time of issuance of this SMP is:

D.J.H. Realty Corp.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: a building, paved parking areas, and maintained lawns. The Site is zoned industrial and is currently utilized for industrial use. Site occupants include J.E. Miller, Inc.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include industrial properties. The properties immediately south and west of the Site include the former Town of Salina landfill; the properties immediately north of the Site include industrial properties; and the properties immediately east of the Site include Brewerton Road.

2.2.2 Geology

Site specific boring logs are provided in Appendix E and note varying depths of fill material across the site. Soils on the site are identified as consisting primarily as silts and

fine gravels, with varying amounts of clays. Fill materials consist of soils with some masonry (bricks) debris. Soil borings at the site were advanced up to 14 feet below grade without bedrock being encountered.

2.2.3 Hydrogeology

Groundwater was generally encountered within a few feet below the ground surface and generally flows in a south-southwest direction beneath the site towards Ley Creek. A groundwater contour map is shown in Figure 3. Groundwater elevation data is provided in Table 5. Groundwater monitoring well construction logs are provided in Appendix E.

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.

TAMS Consultants, Inc. prepared a Site Summary Report for the property in August 1997 as part of a broader investigation of the Onondaga Lake drainage basin. The report concluded the following:

- The most likely potential source of impacts to the Onondaga Lake system was from wastewater discharged to the municipal sanitary sewer system.
- Available data collected as part of the Salina Town Landfill investigation indicated contamination of soil and groundwater in the vicinity of National Plating was likely associated with the adjacent landfill.
- Limited soil data collected from the edges of the National Plating property indicate that historic National Plating operations could have impacted on-site soils.

A Phase I environmental site assessment (ESA) was prepared in 1999 by O'Brien & Gere Engineers, Inc., which recommended that a soil and groundwater investigation be performed. The facility owners subsequently entered the VCP program, and ENSR Corporation a subsurface investigation in December 2004. The results of this investigation were documented in a February 2005 report and indicated the presence of trichloroethylene (TCE) in soils near the former sump structure, as well as cis-1,2 dichloroethylene and trans-1,2 dichloroethylene, which are breakdown products of TCE.

The 2005 report recommended further investigations of the soils surrounding the sump structure and the installation of a groundwater monitoring well south of the site building. Investigation results were presented in a Supplemental Investigation Work Plan.

In lieu of further investigation in the area of the former sump, a remedial excavation was performed on November 8, 2011 to remove the sump and surrounding soils. The excavation was performed in accordance with a NYSDEC-approved Interim Remedial Measures (IRM) Work Plan. The sump and surrounding soil was excavated and transported for off-site disposal at CWM Chemical Services in Model City, New York. The limits of the excavation were constrained by structural columns and heavy machinery in the building. Soil samples from the bottom and sides of the excavation indicated that some residual contamination remained in this area. The excavation was lined with filter fabric, and two loops of perforated 4-inch Schedule 40 polyvinyl chloride (PVC) piping were placed in the excavation: one loop approximately 8 feet below the floor surface, and the second loop below the concrete floor slab. The excavation was backfilled with washed No. 2 rounded sandstone gravel and the concrete floor was restored.

On June 11, 2012, two additional groundwater monitoring wells (MW-5 and MW-6) were installed to further assess impacts to groundwater downgradient of the former sump. Analytical results from a subsurface soil sample collected prior to the installation of MW-5 and surface soil samples from SB-2 and SB-3 did not indicate exceedances of SCOs. The groundwater sample from MW-2, which is located immediately downgradient of the former sump, contained four VOCs were detected at concentrations exceeding NYS Class GA standards. VOCs detected in MW-5, which is further downgradient, did not exceed

Class GA standards. The relatively low impacts detected at downgradient locations indicated that the residual source was limited, and likely associated with impacted soil that could not be removed (due to structural constraints) during the remedial excavation.

A February 25, 2013 Supplemental Investigation letter report concluded that VOC concentrations in downgradient well MW-2 had decreased since the 2004 sample event. The report further recommended a pilot test consisting of three injections of a chemical oxidant into the former sump location (MW-4), followed by the collection of groundwater samples from MW-2, MW-4 and MW-6.

Per NYSDEC and USEPA approvals, injections of sodium permanganate were made through the lower loop of perforated piping on April 28 and May 27, 2015, and water in the former sump area was recirculated on September 15, 2015. Monitoring wells MW-2, MW-5 and MW-6 were sampled following each of these events. Total VOCs decreased from 411 to 6 µg/L in downgradient well MW-2 and to less than detection limits in MW-5. Concentrations varied from 15 to 36 µg/L in samples from MW-6 during this time period.

A soil vapor intrusion (SVI) investigation was completed and documented in a May 1, 2017 letter report to NYSDEC. Prior to initiating the SVI investigation, the owner of the adjacent building to the north was contacted with the offer to include sub-slab vapor samples from his building in the SVI investigation. The owner declined the offer. If ownership of this building changes in the future, or if a change of use occurs, the offer to perform a sub-slab investigation of the adjacent building will be offered again.

Based on the conclusions of the investigation, an SVI mitigation system was installed August 25, 2017 and documented in an August 2017 Construction Completion Report.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs), as listed in the Decision Document, for the Site were as follows:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

2.5 Remaining Contamination

2.5.1 Soil

Boring logs indicate subsurface conditions consisting of approximately 2 feet of fill (sand and gravel with some bricks) over sandy soils to a depth of approximately four feet. As noted in the February 2005 site investigation performed by ENSR Corporation, shallow soil samples from 0 to 2 feet bgs along the western edge of the paved surface exhibited elevated concentrations of several metals. This area was subsequently addressed as part of the remediation of the adjacent former Salina Town Landfill. A soil boring through the former floor sump also indicated elevated concentrations of several metals, along with trichloroethylene (TCE). On November 18, 2011, the former sump structure was removed along with surrounding soils.

Two confirmation soil samples from the final excavation showed no exceedances of SCOs for restricted commercial or industrial use. As noted in Table 2 and Figure 2, five VOCs and three metals exceeded Unrestricted SCOs but were less than Restricted Commercial SCOs. Based on an assumed thickness of two feet, the estimated volume of remaining soil contamination that exceeds Unrestricted SCOs is 25 cubic yards. Prior to back-filling the excavation, a black geofabric was placed in a manner to line the full excavation and act as a demarcation layer. Electrical power is supplied to the site via overhead powerlines. Water and sewer lines enter the front of the building. Natural gas is supplied to the south side of the building.

As noted on Figure 2, remaining contamination associated with the remediation of the former sump is located in an area that is not near underground utilities. Therefore, remaining contamination is not expected to be encountered during the maintenance or removal of utility lines or other buried infrastructure.

2.5.2 Groundwater

Groundwater is encountered approximately 6 feet below the ground surface. Several rounds of measured groundwater elevations have consistently shown groundwater flowing south towards Ley Creek. Well MW-1 is located upgradient of the remedial excavation. MW-4 is located in the restored remedial excavation, and the remaining wells are generally located downgradient of the remedial excavation.

Table 3 and Figure 3 summarize the results of all samples of groundwater that exceed the SCGs after completion of the remedial action. Contaminants of concern in groundwater are VOCs, with the major detected compounds being trichloroethene (TCE) and associated degradation products. The remaining impacted groundwater is located under the building near the former sump structure, with reduced concentrations found in well immediately downgradient of the building.

2.5.3 Soil Vapor

A soil vapor intrusion investigation was performed in 2017 and documented in a May 1, 2017 submission to NYSDEC. Based on these results, a Soil Vapor Mitigation Work Plan was approved by the Department, and the system was installed in August 2017. A second round of soil vapor sampling was performed January 29, 2018 following the installation of the soil vapor mitigation system. These results are documented in Table 4.

Post -mitigation soil vapor data indicated that the highest concentrations of 15 of the 39 detected VOCs were found in the indoor air sample. These results are attributed to current site operations that include many machining operations. Two VOCs had significant concentrations in groundwater from MW-4, which is located in the remediated sump structure: cis-1,2-dichloroethylene at 35,300 µg/L and trichloroethylene at 105,000 µg/L. Cis-1,2-dichloroethylene was not detected in the indoor air sample, indicating that the vapor mitigation system is working properly. The concentration of trichloroethylene was

higher in the indoor sample than either of the sub-slab samples, indicating that there is a likely source of this material in the current operations.

The compound with the highest indoor air concentration was acetone (1,090 $\mu g/m^3$). Sub slab concentrations were 139 $\mu g/m^3$ and 84.8 $\mu g/m^3$. Therefore, it appears that there was another source of acetone in the indoor air during the sampling event.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs 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 B) 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 Decision Document 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 commercial and industrial uses only. Adherence to these ICs on the site is required by the Environmental

Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 2. These ICs are:

- The property may be used for restricted commercial or industrial use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the 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.
- 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.
- A vapor intrusion assessment will be required for any new or existing buildings (including the existing on-site garage) that are redeveloped or occupied in the area within the IC boundaries noted on Figure 2. In addition, a vapor intrusion assessment will be performed for off-site areas (including those that have previously declined testing) where sampling results indicate a reasonable potential for impacts from the National Plating site. 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 (or Cap)

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 asphalt pavement, concrete-covered sidewalks, and concrete building slabs. Figure 2 presents the location of the cover system. In addition, a demarcation layer was placed in the remedial excavation prior to the placement of backfill. The Excavation Work Plan (EWP) provided in Appendix B 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 G.

3.3.2 Sub-Slab Depressurization System

Procedures for operating and maintaining the sub-slab depressurization system (SSD) are documented in the Operation and Maintenance Plan (Section 5.0 of this SMP). As noted in the Mitigation System Installation Record for the system included in Appendix I – Operations and Maintenance Manual, the system is located along the north wall of the building and includes a Radon Away RP265 fan that vents out the north wall and above the roof line. Communication testing at five locations in the building confirmed that the system was maintaining a negative sub-slab pressure. Figure 4 shows the location of the ECs for the site.

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 (or Cap)

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.

3.3.3.2 - Sub-Slab Depressurization System

The active SSD system will not be discontinued unless prior written approval is granted by the NYSDEC and the NYSDOH. In the event that monitoring data indicates that the SSD system may no longer be required, a proposal to discontinue the SSD system will be submitted by the remedial party to the NYSDEC and NYSDOH.

3.3.3.3 - 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.

4.0 MONITORING AND SAMPLING PLAN

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. 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 G.

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 at a minimum of once per year. 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 and continued effectiveness 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.

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

4.3.1 Remedial System Monitoring

Monitoring of the SSD system will be performed on a routine basis, as identified in Table 6 – Remedial System Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSD system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SSD system components to be monitored include, but are not limited to, the components included in Table 6 below.

Table 6 – Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Vacuum Blower	Manometer Reading	Negative Pressure	Annually
General System Piping	Visual Inspection	NA	Annually

A complete list of components to be inspected is provided in the Inspection Checklist, provided in Appendix I - Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.3.2 Remedial System Sampling

Per NYSDOH's October 2006 *Guidance for Evaluating Soil Vapor Intrusion in the State of New York,* the air monitoring of a sub-slab depressurization system is not recommended if the system is maintaining a vacuum under the slab. The inspection procedures presented in Section 4.3.1 will be performed annually to review the remedial system's performance.

4.4 Post-Remediation Media Monitoring and Sampling

Samples shall be collected from Monitoring Wells #2 and #6 on a routine basis. Sampling locations, required analytical parameters and schedule are provided in Table 7 – Post-Remediation Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 7 – Post-Remediation Sampling Requirements and Schedule

Sampling Location	**Analytical Parameters**				**Schedule**
	VOCs (EPA Method 624)	TAL Metals (EPA Method 6010B)	pH (EPA Method 9040)	VOCs (EPA Method TO-15)	
Monitoring Wells #2 and #6	X				Annually
Monitoring Well MW-4	X				Check annually for residual permanganate. If no residual permanganate is present, sample as Monitoring Wells #2 and #6

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

4.4.1 Groundwater Sampling

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.

The network of monitoring wells has been installed to monitor downgradient groundwater conditions at the site. The network of on-site wells has been designed based on the following criteria:

Table 8 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, two downgradient wells are sampled to evaluate the effectiveness of the remedial system.

Table 8 – Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (longitude/latitude)	Well Diameter (inches)	Elevation (above mean sea level)			
				Casing	Surface	Screen Top	Screen Bottom
MW-2	Downgradient	43.090604° N, 76.149653° W	2	372.42	375.6	372.42	362.42
MW-4	Source Area	43.090730ºN 76.149567ºW	4	378.84	379.12	378.0	370.6
MW-6	Downgradient	43.090625º N 76.149514º W	2	377.12	377.75	374.6	364.6

Figure 2 (Site Layout Map) shows the locations of the groundwater monitoring wells. The wells are screened across the groundwater surface, which is encountered at a depth of approximately 6 feet bgs. Groundwater flow direction is generally to the south toward Ley Creek. Monitoring well construction logs are included in Appendix E 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 7.0 – Reporting Requirements.

4.4.2 Soil Vapor Sampling

Soil vapor sampling was performed to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

The network of on-site soil vapor sample locations was designed to assess sub-slab soil vapor conditions. Soil vapor sample locations are noted on Figure 2, and samples were collected and analyzed for VOCs via EPA Method TO-15.

Annual inspection procedures will confirm whether a negative sub-slab pressure is being maintained. 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 soil vapor sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.3 Soil Vapor Intrusion Sampling.

Confirmation soil vapor sampling was performed in 2018. The facility is actively used for machining operations and appear to contribute to concentrations of some indoor air VOCs.

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

The network of on-site soil vapor intrusion sample locations has been designed to assess the potential for vapor intrusion. Soil vapor sampling locations are noted on Figure 2. 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 soil vapor intrusion sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.4 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 in Appendix F of this document.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This Operation and Maintenance Plan provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the site to operate and maintain the sub-slab depressurization (SSD) system;
- Will be updated periodically to reflect changes in site conditions or the manner in which the SSD system is operated and maintained.

Further detail regarding the Operation and Maintenance of the SSD system is provided in Appendix J - Operation and Maintenance Manual. A copy of this Operation and Maintenance Manual, along with the complete SMP, is to be maintained at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Remedial System (or other Engineering Control) Performance Criteria

Minimum operating requirements for the sub-slab vapor collection system are included in Table 6.

5.3 Operation and Maintenance of Sub-Slab Depressurization System

The following sections provide a description of the operations and maintenance of SSD. The Operations and Maintenance Manual for the SSD system is provided in Appendix I.

5.3.1 System Start-Up and Testing

The system was installed and activated in 2017. Facility personnel will periodically monitor the system's manometer to insure a negative pressure is being maintained in the sub-slab atmosphere. In the event that a negative pressure is not being maintained, the system will be inspected and repaired, as necessary.

5.3.2 Routine System Operation and Maintenance

Facility personnel will routinely observe the manometer to verify a negative pressure is being maintained in the sub-slab atmosphere. An annual inspection will be performed and documented on the form included in Attachment I. Deficiencies noted during the inspection will be promptly addressed.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

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

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

The site buildings are not located within the designated 500-year floodplain. The site is level with paved surfaces or maintained lawn areas that are not susceptible to erosion.

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).

This assessment includes, but is not limited to, the following in relation to the implementation and operation and maintenance of the selected remedy:

- Waste Generation associated with the remedy is not expected to occur. Impacted soil that was excavated during the remedial action was disposed at a permitted offsite disposal facility.
- Energy usage is limited to the SSD fan unit which draws a minimal amount of electrical usage for operation of the SSD system.
- Emissions are limited to the SSD system, which are negligible.
- Water usage is not associated with the remedial activities at the site.
- The remedy does not impact any land and/or ecosystems.

Methods proposed to reduce energy consumption, resource usage, waste generation, water usage, etc. should be included in the PRR.

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.

6.3 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.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate Site Management Forms provided in Appendix 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 9 and summarized in the Periodic Review Report.

Table 9: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	At least once within each Periodic Review Report time frame.
Periodic Review Report	Annually, initial report within 16 months of issuance of Certificate of Completion.

*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 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 D -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 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 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."*

- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*

Every five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

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. A general outline for the RSO report is provided in Appendix K. 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.

8.0 REFERENCES

ENSR Corporation, 2005. Subsurface Investigation.

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

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

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

O'Brien & Gere Engineers, Inc., 1999. Phase I Environmental Site Assessment.

Plumley Engineering, P.C., 2011. Supplemental Investigation Work Plan.

Plumley Engineering, P.C., 2012. Remedial Excavation Report.

Plumley Engineering, P.C., 2017. Soil Vapor Intrusion Investigation.

Plumley Engineering, P.C., 2017 Soil Vapor Intrusion Construction Completion Report.

TABLES

[NOTE THAT TABLES 1, 6, 7, 8 AND 9 ARE INCLUDED WITHIN TEXT]

FORMER NATIONAL PLATING FACILITY
Town of Salina, Onondaga County, New York
VCP Site No. V00264

TABLE 2 - REMAINING SOIL SAMPLE EXCEEDANCES

Client Sample ID:	Unit	Unrestricted Use Soil Cleanup Objective[1]	Restricted Industrial Soil Cleanup Objectives[2]	S-1 (BTM 9' BGS)	S-2 (S. WALL 7' BGS)	MW-5 (SOIL 6'-8' BGS)	SB-2	SB-3
Lab Sample ID:				**MC5761-1**	**MC5761-2**	**MC11442-1**	**MC11773-1**	**MC11773-2**
Date Sampled:				**11/18/2011**	**11/18/2011**	**6/11/2012**	**6/25/2012**	**6/25/2012**
MS Volatiles (SW846 8260B)								
Acetone	mg/kg	0.05	1,000	ND (0.43)	**0.417**	ND (0.30)	ND (0.28)	ND (0.27)
cis-1,2-Dichloroethene	mg/kg	0.25	1,000	0.22	**4.93**	ND (0.12)	ND (0.11)	ND (0.11)
trans-1,2-Dichloroethene	mg/kg	0.19	1,000	ND (0.17)	**3.86**	ND (0.12)	ND (0.11)	ND (0.11)
Tetrachloroethene	mg/kg	1.3	300	0.196	ND (0.16)	ND (0.12)	ND (0.11)	ND (0.11)
Trichloroethene	mg/kg	0.47	400	**198**	**2.04**	ND (0.12)	ND (0.11)	ND (0.11)
Vinyl chloride	mg/kg	0.02	27	ND (0.17)	**0.217**	ND (0.12)	ND (0.11)	ND (0.11)
MS Semi-volatiles (SW846 8270C)								
bis(2-Ethylhexyl)phthalate	mg/kg	NS	NS	2.79	1.31	NA	NA	NA
Metals Analysis								
Aluminum	mg/kg	NS	NS	8,450	12,700	5,200	NA	NA
Arsenic	mg/kg	13	16	5.2	6.5	3.2	NA	NA
Barium	mg/kg	350	10,000	43.2	101	54.6	NA	NA
Beryllium	mg/kg	7.2	2,700	<0.40	0.59	<0.36	NA	NA
Cadmium	mg/kg	2.5	60	**3**	**26.5**	1.7	NA	NA
Calcium	mg/kg	NS	NS	1,870	2,340	129,000	NA	NA
Chromium	mg/kg	NS	NS	14.3	57.1	13.4	NA	NA
Cobalt	mg/kg	NS	NS	8.1	7	<4.5	NA	NA
Copper	mg/kg	50	10,000	23.1	29.5	9.8	NA	NA
Iron	mg/kg	NS	NS	19,300	19,700	9,520	NA	NA
Lead	mg/kg	63	3,900	5.3	19.3	6.5	NA	NA
Magnesium	mg/kg	NS	NS	3,180	2,390	25,800	NA	NA
Manganese	mg/kg	1,600	10,000	682	523	194	NA	NA
Mercury	mg/kg	0.18	5.7	0.04	0.18	<0.034	NA	NA
Nickel	mg/kg	30	10,000	25.3	**221**	11.1	NA	NA
Potassium	mg/kg	NS	NS	1,420	1,230	1,010	NA	NA
Silver	mg/kg	2	6,800	<0.50	0.52	0.5	NA	NA
Vanadium	mg/kg	NS	NS	14.8	20.7	12.7	NA	NA
Zinc	mg/kg	109	10,000	28.2	**247**	27.8	NA	NA
Cyanide	mg/kg	27	10,000	25.2	0.45	NA	NA	NA
General Chemistry								
Solids, Percent	%	-	-	73.7	73.6	89.5	94.5	96.3

Notes: **Legend:** Hit | **Exceed**

[1]New York Codes, Rules and Regulations, Title 6 (6 NYCRR), Part 375-6, *Remedial Program Soil Cleanup Objectives* , dated December 2006.
[2]New York Codes, Rules and Regulations, Title 6 (6NYCRR), Part 375-6 for Restricted Industrial Use.
mg/kg milligrams per kilogram, equivalent to parts per million (ppm)
ND Not detected less than
NS No State standard
NA Not Analyzed

FORMER NATIONAL PLATING FACILITY
Town of Salina, Onondaga County, New York
VCP Site No. V00264

TABLE 3 - REMAINING GROUNDWATER EXCEEDANCES

Client Sample ID:	Units	State Standard[1]	MW-1		MW-2		MW-3	MW-3A	MW-4	MW-5	MW-6
Date Sampled:			12/21/04	06/22/12	12/21/04	06/22/12	12/21/04	06/22/12	06/22/12	06/22/12	06/22/12
GC/MS Volatiles (SW846 8260B)											
Acetone	µg/L	NS	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	28
Benzene	µg/L	0.7	ND (0.50)	ND (0.50)	ND (1.0)	**1.2**	ND (0.50)	ND (0.50)	**3**	ND (0.50)	ND (0.50)
Bromodichloromethane	µg/L	NS	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	4	ND (1.0)	126	ND (1.0)	ND (1.0)
Chlorobenzene	µg/L	5	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (5.0)	ND (1.0)	ND (5.0)	ND (1.0)	ND (1.0)
Chloroform	µg/L	7	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	2	ND (1.0)	1
1,1-Dichloroethene	µg/L	5	ND (1.0)	ND (1.0)	0.58	ND (1.0)	ND (1.0)	ND (1.0)	**125**	ND (1.0)	ND (1.0)
cis-1,2-Dichloroethene	µg/L	5	ND (1.0)	ND (1.0)	**200**	**14**	ND (1.0)	ND (1.0)	**35,300**	1	ND (1.0)
trans-1,2-Dichloroethene	µg/L	5	ND (1.0)	ND (1.0)	**10**	ND (1.0)	ND (1.0)	ND (1.0)	**3,920**	ND (1.0)	ND (1.0)
1,2-Dichloropropane	µg/L	1	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	**36**	ND (2.0)	ND (2.0)
Tetrachloroethene (PCE)	µg/L	5	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	4	ND (1.0)	ND (1.0)
Toluene	µg/L	5	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	**6**	ND (1.0)	ND (1.0)
Trichloroethene (TCE)	µg/L	5	ND (1.0)	ND (1.0)	**170**	**7**	ND (1.0)	ND (1.0)	**105,000**	3	ND (1.0)
Vinyl chloride	µg/L	2	ND (1.0)	ND (1.0)	**30**	**4**	ND (1.0)	ND (1.0)	**1,100**	ND (1.0)	ND (1.0)
Xylene (Total)	µg/L	5	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	**10**	ND (1.0)	ND (1.0)
GC/MS Semi-Volatiles (SW846 8270C)											
Naphthalene	µg/L	10	NA	NA	NA	ND (1.9)	NA	NA	3	NA	NA
Metals Analysis											
Aluminum	µg/L	NS	1,000	NA	<200	15,400	NA	NA	1,540	NA	NA
Arsenic	µg/L	25	<10	NA	<10	5	NA	NA	<4.0	NA	NA
Barium	µg/L	1,000	201	NA	236	207	NA	NA	142	NA	NA
Cadmium	µg/L	5	<1	NA	**33**	**22**	NA	NA	**56**	NA	NA
Calcium	µg/L	NS	16,200	NA	177,000	118,000	NA	NA	114,000	NA	NA
Chromium	µg/L	50	<4	NA	**38**	**104**	NA	NA	**53**	NA	NA
Hexavalent Chromium (Total)	µg/L	50	<0.01	NA	0.028	<10	NA	NA	<10	NA	NA
Cobalt	µg/L	NS	<4	NA	4	<50	NA	NA	<50	NA	NA
Copper	µg/L	200	10	NA	<10	31	NA	NA	<25	NA	NA
Iron	µg/L	300	**1,050**	NA	97	**16,700**	NA	NA	**2,570**	NA	NA
Lead	µg/L	25	<5	NA	<5	10	NA	NA	8	NA	NA
Magnesium	µg/L	NS	35,900	NA	44,200	29,000	NA	NA	19,300	NA	NA
Manganese	µg/L	300	**6,880**	NA	**3,370**	**614**	NA	NA	**2,190**	NA	NA
Nickel	µg/L	100	10	NA	39	<40	NA	NA	77	NA	NA
Potassium	µg/L	NS	40,500	NA	14,600	13,000	NA	NA	13,100	NA	NA
Sodium	µg/L	20,000	**433,000**	NA	**326,000**	**76,300**	NA	NA	**323,000**	NA	NA
Vanadium	µg/L	NS	<5	NA	<5	25	NA	NA	<10	NA	NA
Zinc	µg/L	NS	<20	NA	<20	35	NA	NA	65	NA	NA

Notes:

[1]DEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values* , dated June 1998 and April 2002 Addendum.
Non-detected levels are denoted by ND(1.0), <10

µg/L micrograms per liter, equivalent to parts per billion (ppb)
NS No State standard
NA Not Analyzed
No PCBs were detected in the groundwater.

Legend: Hit | **Exceed**

FORMER NATIONAL PLATING FACILITY
Town of Salina, Onondaga County, New York
VCP Site No. V00264

TABLE 4 - REMAINING SOIL VAPOR SAMPLE EXCEEDANCES

Client Sample ID:	Unit	AMBIENT AIR	INDOOR AIR	S-1	S-2
Lab Sample ID:		JC59930-1	JC59930-2	JC59930-3	JC59930-4
Date Sampled:		01/29/2018	01/29/2018	01/29/2018	01/29/2018
MS Volatiles (TO-15)					
Acetone	µg/m³	15	1090	139	84.8
Benzene	µg/m³	0.86	1.1	6.7	0.86
Carbon disulfide	µg/m³	ND (0.081)	0.44 J	14	0.31 J
Chloroethane	µg/m³	ND (0.077)	ND (0.077)	2.3	ND (0.095)
Chloroform	µg/m³	ND (0.12)	ND (0.12)	1	ND (0.15)
Chloromethane	µg/m³	1.2	1.3	0.81	0.43
Carbon tetrachloride	µg/m³	ND (0.10)	0.53	0.59	0.55
Cyclohexane	µg/m³	ND (0.096)	0.27 J	5.2	0.38 J
1,1-Dichloroethane	µg/m³	ND (0.11)	ND (0.11)	1.3	0.85
1,4-Dioxane	µg/m³	1.5	ND (0.14)	ND (0.17)	ND (0.17)
Dichlorodifluoromethane	µg/m³	2.9	2.6	2.4	2.8
trans-1,2-Dichloroethylene	µg/m³	ND (0.079)	ND (0.079)	1.9	1.5
cis-1,2-Dichloroethylene	µg/m³	ND (0.11)	ND (0.11)	3.4	4.8
Ethanol	µg/m³	5.7	83.8	18	15
Ethylbenzene	µg/m³	0.42 J	26	14	4.8
Ethyl Acetate	µg/m³	1.2	15	4	6.8
4-Ethyltoluene	µg/m³	ND (0.11)	5.4	1.8	1.7
Freon 113	µg/m³	0.67	0.59 J	ND (0.18)	ND (0.18)
Heptane	µg/m³	0.41 J	5.7	21	1.3
Hexane	µg/m³	0.56	0.99	21	1.6
2-Hexanone	µg/m³	0.57 J	ND (0.13)	ND (0.17)	0.9
Isopropyl Alcohol	µg/m³	0.98	13	35.2	23
Methylene chloride	µg/m³	ND (0.090)	0.56	0.94	0.69
Methyl ethyl ketone	µg/m³	1.6	7.1	50.4	37.5
Methyl Isobutyl Ketone	µg/m³	0.33 J	1.3	2.4	1.3
Styrene	µg/m³	ND (0.16)	1.2	0.68 J	0.77 J
1,2,4-Trimethylbenzene	µg/m³	0.74 J	18	6.9	6.9
1,3,5-Trimethylbenzene	µg/m³	ND (0.12)	5.4	2.1	2
2,2,4-Trimethylpentane	µg/m³	0.37 J	ND (0.098)	20	0.70 J
Tertiary Butyl Alcohol	µg/m³	0.82	4.9	7.3	2.9
Tetrachloroethylene	µg/m³	ND (0.088)	0.75	1.5	1.8
Tetrahydrofuran	µg/m³	ND (0.11)	0.77	24	23
Toluene	µg/m³	1.3	3.7	70.5	6.8
Trichloroethylene	µg/m³	0.2	238	199	210
Trichlorofluoromethane	µg/m³	1.5	26	9	11
Vinyl Acetate	µg/m³	ND (0.077)	2.8	ND (0.095)	ND (0.095)
m,p-Xylene	µg/m³	1.6	111	46.5	18
o-Xylene	µg/m³	0.56 J	34	13	5.2
Xylenes (total)	µg/m³	2.1	146	59.1	24

µg/m³ Micrograms per cubic meter
ND Not detected

Legend: Hit

FORMER NATIONAL PLATING FACILITY
Town of Salina, Onondaga County, New York
VCP Site No. V00264

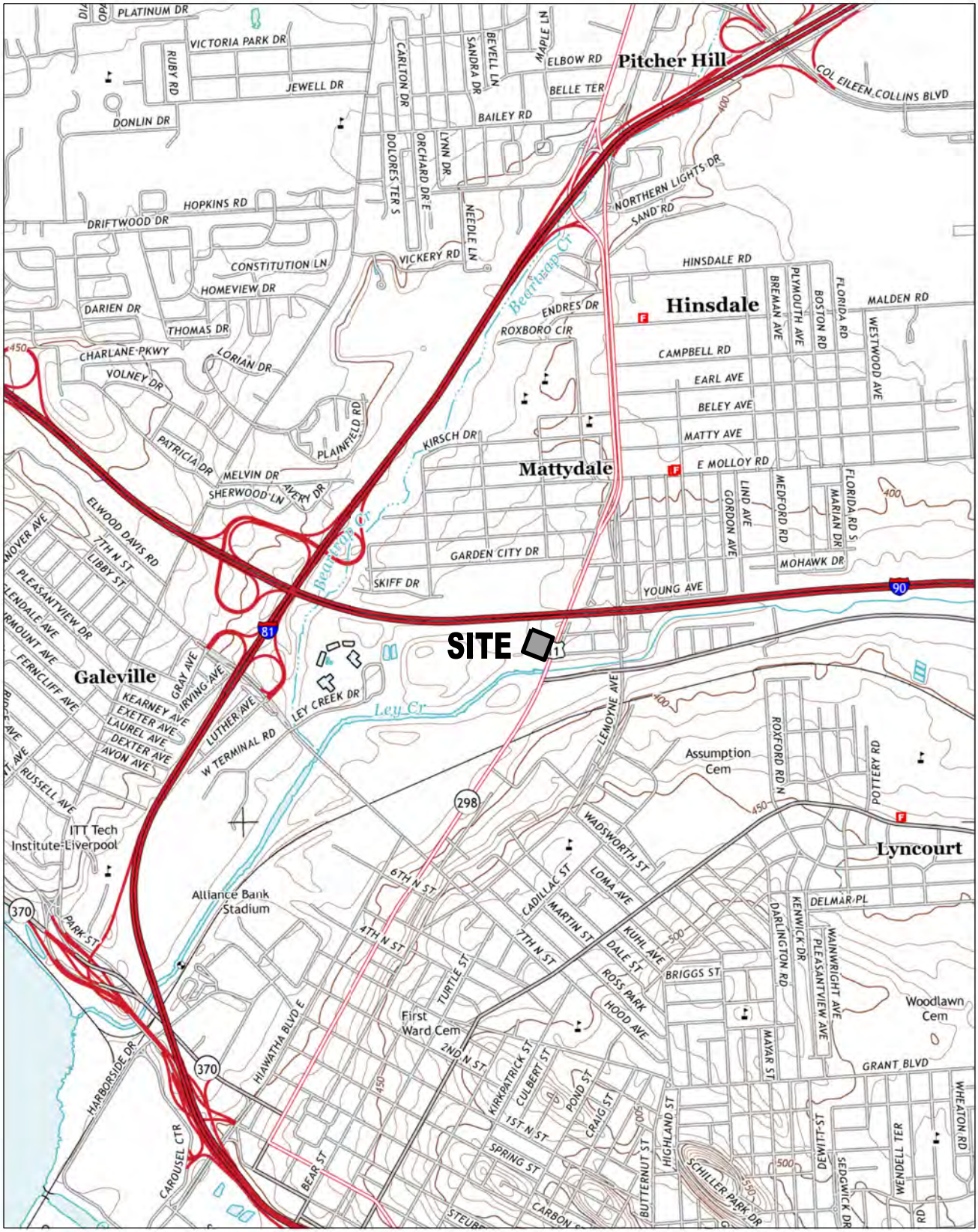
TABLE 5 - GROUNDWATER ELEVATION MEASUREMENTS

Monitoring Well Construction Data	Monitoring Well					
	MW-1	**MW-2**	**MW-3A**	**MW-4**	**MW-5**	**MW-6**
Rim Elevation (feet)[1]	378.55	375.22	373.36	378.84	374.19	377.12
Ground Surface Elevation	378.92	375.59	373.65	379.12	374.79	377.75
Depth of Well (feet)	13.5	12.5	13.7	8.3	10.5	12.50
Bottom of Well Elevation (feet)	365.1	362.7	359.7	370.6	363.7	364.6
Well Diameter (inches)	2	2	2	4	2	2
Date	**Groundwater Elevation (feet)**					
	MW-1	**MW-2**	**MW-3A**	**MW-4**	**MW-5**	**MW-6**
06/18/2012	374.84	371.90	367.53	373.91	367.63	366.41
06/22/2012	374.80	372.32	367.50	373.89	367.54	366.32
06/25/2012	NM	372.39	NM	374.11	NM	NM
02/11/2013	376.13	371.70	369.47	375.11	368.60	373.51
04/28/2015	NM	372.59	NM	375.49	NM	373.72
05/27/2015	NM	372.52	NM	374.79	368.89	373.07
07/06/2015	363.65	372.95	NM	375.94	369.80	374.32
07/14/2016	362.44	372.17	NM	NM	368.42	372.70

Notes:

[1]Rim elevation data is based on rim elevation of MW-1 reported by ENSR in the February 2005 Site Investigation Report.
NM Well Not Measured

FIGURES



REF.: USGS - SYRACUSE WEST QUAD., 2013, 7.5 MIN. SCALE: 1"=2000'

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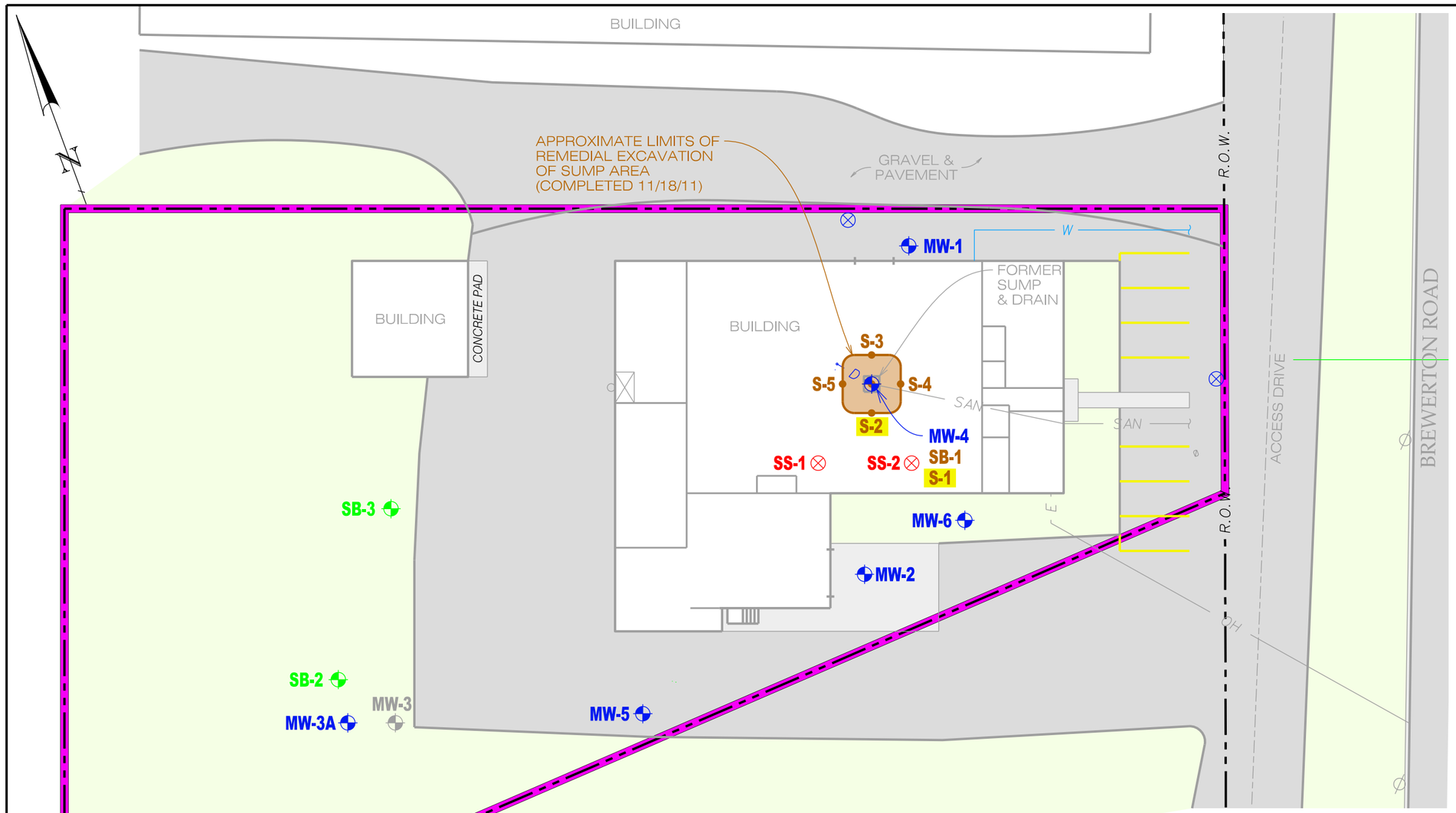
PROJECT: FORMER NATIONAL PLATING

DWG. TITLE: SITE LOCATION MAP

CLIENT: D.H.J. REALTOR CORP.

LOCATION: TOWN OF SALINA, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010150
FILE NAME.:	FIGURE 1
SCALE:	AS NOTED
DATE:	FEB. 2018
ENG'D BY:	DKM
DRAWN BY:	JJL
CHECKED BY:	DRV



Key

- R.O.W. — Right of Way
- Property Line
- Utility Pole
- E — Underground Electric
- OH — Overhead Utility
- D — Drainage LIne
- SAN — Sanitary Sewer Line
- W — Water Service Line
- MW-1 — Monitoring Well (December 2004)
- MW-3 — Monitoring Well Destroyed During Remedial Landfill Excavation
- SB-1 — Soil Boring (December 2004)
- SB-2 — Shallow Soil Boring (Completed 06/2012)
- S-2 — Confirmation Soil Sample (Collected 11/18/11)
- Soil Vapor Probe
- Sub-slab Soil Vapor Samples
- S-1 — Exceedance of Unrestricted SCOs

Plan View

1" = 30' SCALE — 15 0 15 30 FEET

DEC SITE: VCP00265-7

Basemap References:

1. *"Groundwater Flow Map, Former National Plating Facility, 1501 Brewerton Road, Syracuse, New York" Prepared by: ENSR International; Dated: February 10, 2005; Project No.: 10160-004.*
2. *"National Plating, Inc., 1501 Brewerton Road, Syracuse, New York, Site Layout" Dated: May 20, 1999.*

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REVISIONS: DATE: BY:

PROJECT: FORMER NATIONAL PLATING

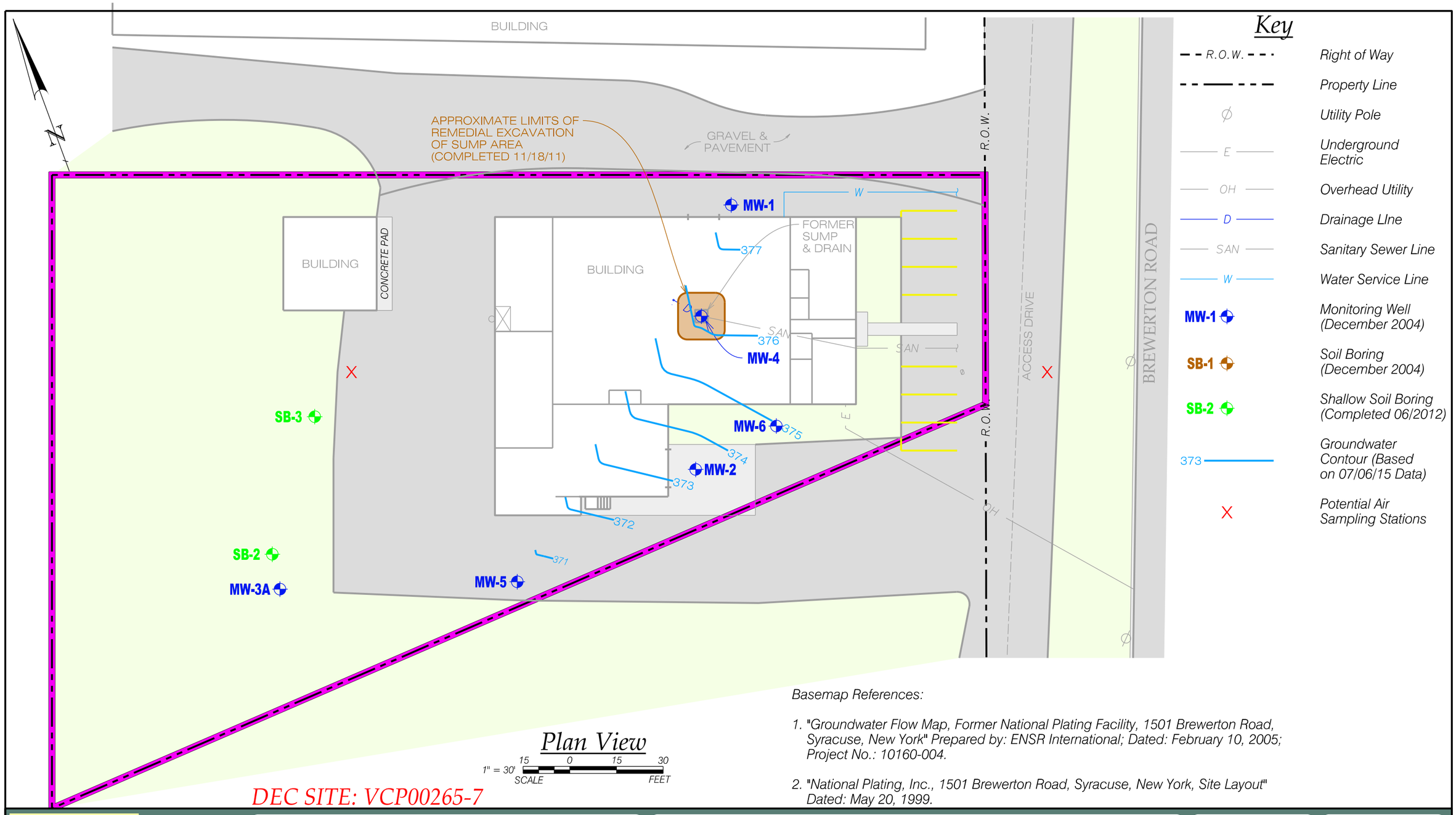
DWG. TITLE: SITE LAYOUT MAP

CLIENT: DJH REALTY CORP.

LOCATION: TOWN OF SALINA, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010150
FILE NAME.:	FIGURE 2
SCALE:	AS NOTED
DATE:	FEB. 2018
ENG'D BY:	DKM
DRAWN BY:	JJL
CHECKED BY:	DRV

SHEET NO.: FIGURE 2



Plan View

1" = 30' SCALE — 15 0 15 30 FEET

DEC SITE: VCP00265-7

Basemap References:

1. *"Groundwater Flow Map, Former National Plating Facility, 1501 Brewerton Road, Syracuse, New York" Prepared by: ENSR International; Dated: February 10, 2005; Project No.: 10160-004.*
2. *"National Plating, Inc., 1501 Brewerton Road, Syracuse, New York, Site Layout" Dated: May 20, 1999.*

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REVISIONS: DATE: BY:

PROJECT: FORMER NATIONAL PLATING

DWG. TITLE: GROUNDWATER CONTOUR MAP

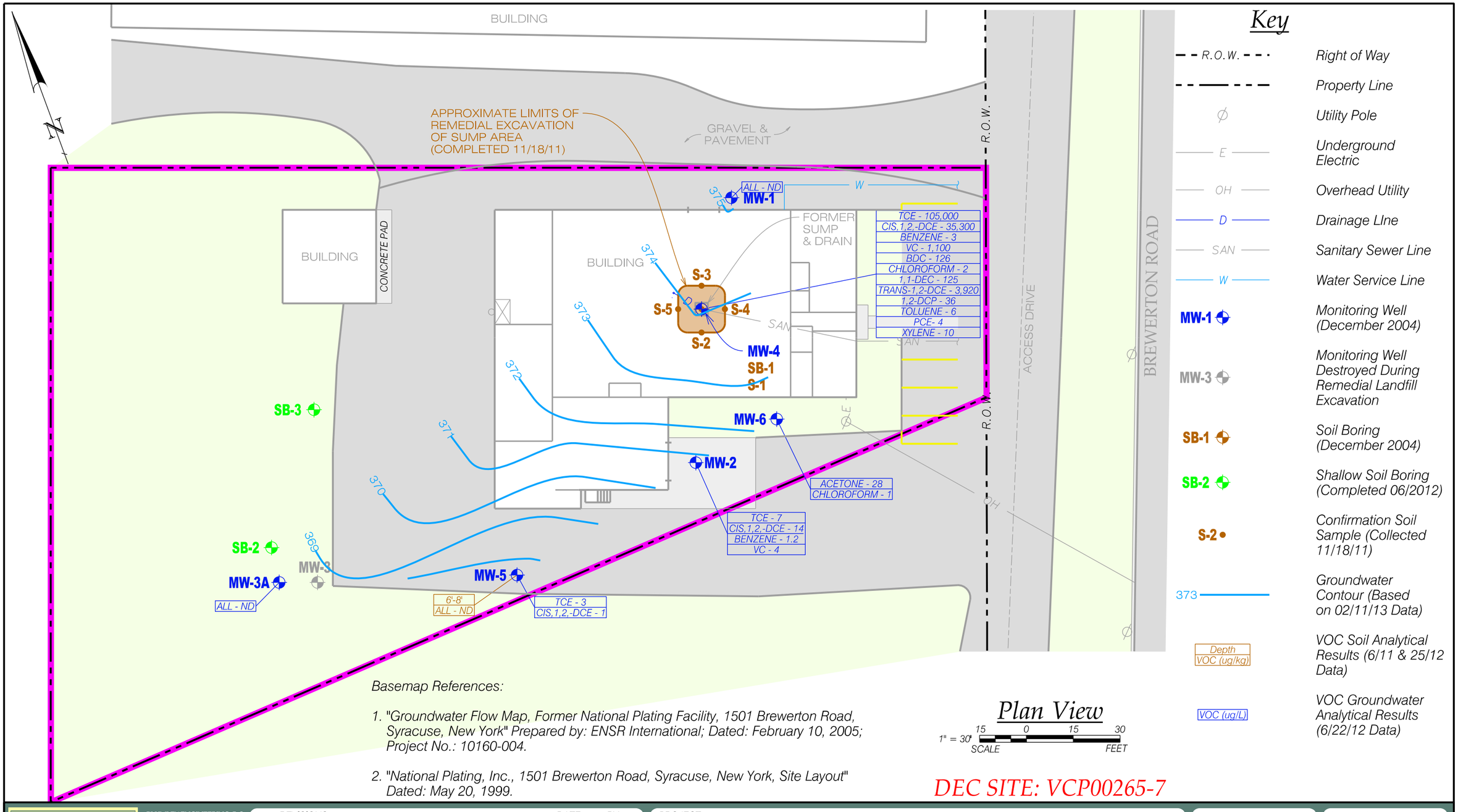
CLIENT: DJH REALTY CORP.

LOCATION: TOWN OF SALINA, ONONDAGA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2010150
FILE NAME.:	FIGURE 3
SCALE:	AS NOTED
DATE:	FEB. 2018
ENG'D BY:	DKM
DRAWN BY:	JJL
CHECKED BY:	DRV

SHEET NO.: FIGURE 3



Key

- R.O.W. — Right of Way
- Property Line
- Utility Pole
- E — Underground Electric
- OH — Overhead Utility
- D — Drainage LIne
- SAN — Sanitary Sewer Line
- W — Water Service Line
- MW-1 — Monitoring Well (December 2004)
- MW-3 — Monitoring Well Destroyed During Remedial Landfill Excavation
- SB-1 — Soil Boring (December 2004)
- SB-2 — Shallow Soil Boring (Completed 06/2012)
- S-2 — Confirmation Soil Sample (Collected 11/18/11)
- 373 — Groundwater Contour (Based on 02/11/13 Data)
- Depth / VOC (ug/kg) — VOC Soil Analytical Results (6/11 & 25/12 Data)
- VOC (ug/L) — VOC Groundwater Analytical Results (6/22/12 Data)

Basemap References:

1. *"Groundwater Flow Map, Former National Plating Facility, 1501 Brewerton Road, Syracuse, New York" Prepared by: ENSR International; Dated: February 10, 2005; Project No.: 10160-004.*

2. *"National Plating, Inc., 1501 Brewerton Road, Syracuse, New York, Site Layout" Dated: May 20, 1999.*

Plan View

1" = 30'

15 0 15 30

SCALE FEET

DEC SITE: VCP00265-7

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Civil and Environmental Engineering

REVISIONS: DATE: BY:

PROJECT: FORMER NATIONAL PLATING

DWG. TITLE: REMAINING GROUNDWATER SAMPLE EXCEEDANCES

CLIENT: D.H.J. REALTY CORP.

LOCATION: TOWN OF SALINA, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010150
FILE NAME.:	FIGURE4
SCALE:	AS NOTED
DATE:	FEB. 2018
ENG'D BY:	DKM
DRAWN BY:	JJL
CHECKED BY:	DRV

SHEET NO.:

FIGURE 4

APPENDICES

APPENDIX A – LIST OF SITE CONTACTS

Name	Phone/Email Address
Site Owner: D J H Realty	(315) 437-6811 / dennishile@aol.com
Qualified Environmental Professional: Dale R. Vollmer, P.E.	(315) 638-8587 / dvollmer@plumleyeng.com
NYSDEC DER Project Manager: Michael Belveg	(315) 426-7446 / Michael.belveg@dec.ny.gov
NYSDEC Regional HW Engineer: Harry Warner	(315) 426-7524 / harry.warner@dec.ny.gov
NYSDEC Site Control: Kelly Lewandowski	(518) 402-9764 / Kelly.lewandowski@dec.ny.gov
Heather L. Sunser, Esq.	(315) 425-2796 HSunser@barclaydamon.com

APPENDIX B – EXCAVATION WORK PLAN (EWP)

B-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 B-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 A.

Table B-1: Notifications*

Regional Office NYSDEC Representative: Michael Belveg	(315) 426-7446 Michael.belveg@dec.ny.gov
NYSDEC Site Control: Kelly Lewandowski	(518) 402-9764 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 C 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.

B-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 when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

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 Sections B-6 and B-7 of this Appendix.

B-3 SOIL STAGING METHODS

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

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

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

B-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.

B-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:

- Trucks heading north will exit the site by turning left onto Brewerton Road (US Route 11), a major north-south truck route.
- Trucks heading south will turn right onto Brewerton Road.
- Trucks heading east or west will take Brewerton Road to the appropriate east-west crossroad.

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

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

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

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

B-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).

B-7 MATERIALS REUSE ON-SITE

Material reuse on-site will comply with the requirements of NYSDEC DER-10 Section 5.4(e)4. 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.

B-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.

B-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 Decision Document. The existing cover system is comprised of a minimum of asphalt pavement, concrete covered sidewalks and concrete building. The remedial excavation was lined with a demarcation layer prior to backfilling. If the type of cover system changes from that which exists prior to the excavation (i.e., concrete floor slab is removed), 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.

B-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). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Appendix 5 of DER-10. 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.

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.

B-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at

the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

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

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

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

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

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

B-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.

B-13 COMMUNITY AIR MONITORING PLAN

The Generic Community Air Monitoring Plan (CAMP) contained in Appendix 1A of DER-10 will be implemented for any ground-intrusive activities. VOCs and particulate matter less than 10 micrometers in size (PM-10) will be monitored at the downwind perimeter of the immediate work area on a continuous basis. Upwind concentrations of VOCs will be monitored at the start of each workday and periodically thereafter to establish background conditions. Upwind PM-10 concentrations will be monitored continuously. If the downwind air concentrations of total VOCs and PM-10 exceeds criteria in the Generic CAMP for the 15-minute average, the procedures outline in the Generic CAMP must be implemented.

A figure showing the location of air sampling stations based on generally prevailing wind conditions is shown in Figure B-1. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. If a sensitive receptor, such as a school, day care or residential area is adjacent to the site, a fixed monitoring station should be located at that site perimeter, regardless of wind direction, and discussed in the text.

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

B-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site and on-site. Specific odor control methods to be used on a routine basis will include screening open excavations with a photoionization detection (PID) meter. 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.

B-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.

B-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 C
RESPONSIBILITIES of
OWNER and REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan ("SMP") for the Former National Plating Company, Inc. site (the "site"), number V00264, are divided between the site owner(s) and a Remedial Party, as defined below. The owner is currently listed as:

D.J.H. Realty Corp. (the "owner").
747 West Manlius Street
East Syracuse, New York

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party ("RP") refers to any of the following: certificate of completion holder, volunteer, applicant, responsible party, and, in the event the New York State Department of Environmental Conservation ("NYSDEC") is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf. The RP is:

D.J.H. Realty Corp.
747 West Washington Street
East Syracuse, New York

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the site.

Site Owner's Responsibilities

1) The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the site.

2) In accordance with a periodic time frame determined by the NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the site's Periodic Review Report (PRR) certification to the NYSDEC.

3) In the event the site is delisted, the owner remains bound by the Environmental Easement and shall submit, upon request by the NYSDEC, a written certification that the Environmental Easement is still in place and has been complied with.

4) The owner shall grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the site's RP and the NYSDEC in accordance with the timeframes indicated in Section 1.3-Notifications.

6) In the event some action or inaction by the owner adversely impacts the site, the owner must notify the site's RP and the NYSDEC in accordance with the time frame indicated in Section 1.3- Notifications and (ii) coordinate the performance of necessary corrective actions with the RP.

7) The owner must notify the RP and the NYSDEC of any change in ownership of the site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the site property. 6 NYCRR Part contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 2.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

8) Until such time as the NYSDEC deems the vapor mitigation system unnecessary, the owner shall operate the system, pay for the utilities for the system's operation, and report any maintenance issues to the RP and the NYSDEC.

9) In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data, that is produced with respect to structures and that exceeds NYSDOH or OSHA guidelines on the site, whether produced by the NYSDEC, RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

Remedial Party Responsibilities

1) The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the site.

2) The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.

3) Before accessing the site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the site visit and/or any final report produced.

4) If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).

5) The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

6) The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3- Notifications of the SMP.

7) The RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the site, as required in Appendix I (Operation, Monitoring and Maintenance Manual) of the SMP.

8) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.

9) Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.

Change in RP ownership and/or control and/or site ownership does not affect the RP's obligations with respect to the site unless a legally binding document executed by the NYSDEC releases the RP of its obligations.

Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

APPENDIX D – ENVIRONMENTAL EASEMENT

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

THIS INDENTURE made this 29th day of March, 20 18 between Owner(s) D.J.H. Realty Corp., having an office at 1501 Brewerton Road, Syracuse, New York 13208, 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 1501 Brewerton Road in the Town of Salina, 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 073 Block 01 Lot 04.0, being the same as that property conveyed to Grantor by deed dated July 1, 1987 and recorded in the Onondaga County Clerk's Office in Liber and Page 3366/22. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.95 +/- acres, and is hereinafter more fully described in the Land Title Survey dated June 18, 2001 and last revised January 18, 2018 prepared by David William Hannig, L.L.S. or D.W. Hannig L.S., 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 Voluntary Cleanup Agreement Number: A7-0493-0903, 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:

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), excluding day care, child care and medical care uses.

(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 or Restricted Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i) and (ii), 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: V00264
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.

D.J.H. Realty Corp.:

By: _____

Print Name: Dennis J Hile

Title: Pres. Date: 03.23.2018

Grantor's Acknowledgment

STATE OF ~~NEW YORK~~ FL)
) ss:
COUNTY OF Collier)

On the 23 day of March, in the year 2018, before me, the undersigned, personally appeared Dennis J. Hile, 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~~ Florida

Tatiana Arrazola
NOTARY PUBLIC
STATE OF FLORIDA
Comm# FF991750
Expires 5/24/2020

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: _____
Michael J. Ryan, Assistant Director
Division of Environmental Remediation

Grantee's Acknowledgment

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

On the 29th day of March, in the year 2018, before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
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

Easement Area Legal Description

All that certain tract or parcel of land, situated in the Town of Salina, County of Onondaga and State of New York, being a part of Farm Lot No. 18 in said Town bounded and described as follows: BEGINNING at a point of intersection of the southerly line of property conveyed to Willis C. Jones, by deed dated August 13, 1948 and recorded in the Onondaga County Clerk's Office August 14, 1948 in Book 1345 of Deeds at page 658&c., with the westerly line of Brewerton Road;

Thence South 20 degrees 16 minutes 40 seconds West, along the westerly line of Brewerton Road, a distance of 73.61 feet to an iron pipe for a corner, the same being located on the northerly line of the Ley Creek Sanitary Sewer Right of Way;

Thence South 86 degrees 53 minutes 00 seconds West, along said northerly line of the Ley Creek Sanitary Sewer Line Right of Way; a distance of 326.88 feet to a half inch iron pipe for a corner;

Thence North 20 degrees 16 minutes 40 seconds East, a distance of 203.40 feet to a one and one-half inch (1-1/2') iron pipe for a corner;

Thence South 69 degrees 43 minutes 20 seconds East, a distance of 100 feet to an iron rod, the same being located at the southeasterly corner of the aforesaid Willis C. Jones tract, continuing along said course along the southerly line of said Willis C. Jones Tract a distance of 200 feet to the PLACE OF BEGINNING.

Being the same premises conveyed by Antoinette J. Davin as Executrix of the Estate of Josephine L LeRoy to Antoinette J. Davin, individually by deed dated June 29, 1985 and recorded in the Office of the Clerk of the County of Onondaga in Book 3150 of Deeds at page 252&c.

APPENDIX E – MONITORING WELL BORING AND CONSTRUCTION LOGS

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating		**BORING ID:** **SUMP**
Project Number: 10160-004			
Site Location: Syracuse, NY			
Coordinates:	*Elevation:*		*Sheet:* 1 of 1
Drilling Method: direct push macro core			*Monitoring Well Installed:* Y N
Sample Type(s):	*Boring Diameter:* 2 in.		*Screened Interval:*
Weather:	*Logged By:* JDF	*Date/Time Started:* 12/10/04	*Depth of Boring:* 8.75 feet
Drilling Contractor: Parratt-Wolff	*Ground Elevation:*	*Date/Time Finished:* 12/10/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	Recovery (in. or ft.)	(Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth (Inches)
0									
1									
2							Sump area -- bottom of sump approximately 4', 9" below grade.		
3									
4									
					6286			SUMP	4.75' - 6.75'
5							4', 9" -- Well-graded, SAND and GRAVEL (coarse) FILL, visible black oil spots, strong sweet odor,		
					3421		5', 3" -- Brown CLAY, some Silt, trace rounded coarse Gravel, moist.		
6									
					599		6', 9" -- SAA		
7					736				
8									
					2584		8', 9" SAA		
9							Boring terminated at 8'9".		
10									

NOTES:

Date	Time	Depth to groundwater while drilling

Checked by Karl Rose Date: 02/10/05

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating		**BORING ID:** SS-1
Project Number: 10160-004			
Site Location: Syracuse, NY			
Coordinates: Northing: 1126432.6 Easting: 936138.5 *Elevation:* 378.9			*Sheet:* 1 of 1
Drilling Method: direct push macro core			*Monitoring Well Installed:* Y N
Sample Type(s):	*Boring Diameter:*		*Screened Interval:*
Weather:	*Logged By:* JDF	*Date/Time Started:* 12/10/04	*Depth of Boring:* 4 feet
Drilling Contractor: Parratt-Wolff	*Ground Elevation:*	*Date/Time Finished:* 12/10/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	Recovery (in. or ft.)	(Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth
0				0.9			FILL	SS-1A	0-2'
1									
2				1.8	4.9		Brown Silty CLAY, wet, no odor.	SS-1B	2'-4'
3							SS-1A, SS01B sampled at 16:20		
4							Boring terminated at 4'.		
5									
6									
7									
8									
9									
10									

NOTES:

Date	Time	Depth to groundwater while drilling

Checked by Kra Rev Date: 02/10/05

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating		**BORING ID:** SS-2
Project Number: 10160-004			
Site Location: Syracuse, NY			
Coordinates: Northing: 1126408.9 Easting: 935912.7	*Elevation:* 373.5		*Sheet:* 1 of 1
Drilling Method: direct push macro core			*Monitoring Well Installed:* Y N
Sample Type(s):	*Boring Diameter:* 2 in.		*Screened Interval:*
Weather:	*Logged By:* JDF	*Date/Time Started:* 12/10/04	*Depth of Boring:* 4 feet
Drilling Contractor Parratt- Wolff		*Date/Time Finished:* 12/10/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	Recovery (in. or ft.)	(Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth (ft)
0		0-2		0.8'			0-0.3 – Brown GRAVEL, some Silt and Clay	SS-2A	0-2
1					4.7		0.3-2 – Black fine SILT, some fine brown Sand, saturated, no odor.		
2				0.7			Black, organic, wood chips, saturated, no odor.	SS-2B	2-4
3							Sample SS-2A, and SS-2B at 14:30.		
4					6.0		Boring terminated at 4'.		
5									
6									
7									
8									
9									
10									

NOTES:

Date	Time	Depth to groundwater while drilling

Checked by Karl Raine Date: 02/10/05

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Eslabrook	*Project:* National Plating		**BORING ID:** SS-3
Project Number: 10160-004			
Site Location: Syracuse, NY			
Coordinates: Northing: 1126434.4 Easting: 935920.1 *Elevation:* 374.3			*Sheet:* 1 of 1
Drilling Method: direct push macro core			*Monitoring Well Installed:* Y N
Sample Type(s):	*Boring Diameter:* 2 in.		*Screened Interval:*
Weather:	*Logged By:* JDF	*Date/Time Started:* 12/10/04	*Depth of Boring:* 4 feet
Drilling Contractor: Parratt-Wolff		*Date/Time Finished:* 12/10/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	Recovery (in. or ft.)	(Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth
0				0.8			0-0.45 – Brown Gravel FILL, brick pieces.	SS-3A	0-2
							0.45-0.8 – Black organics, Silt and Clay, trace wood pieces, wet.	SS-DUP	0-2
1									
2				0.75	10.8		Dark gray-brown silty CLAY, wet.	SS-3B	2-4
3									
							SS-3A, 0-2', SS-3B, 2-4', SS-DUP (duplicate of SS-3A), collected at 13:40.		
4					2.3		Boring Terminated at 4'.		
5									
6									
7									
8									
9									
10									

NOTES:

Date	Time	Depth to groundwater while drilling

Checked by K. L. Date: 02/10/05

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating		**BORING ID:** SS-4
Project Number: 10160-004			
Site Location: Syracuse, NY			
Coordinates: Northing: 1126446.5 Easting: 935944.7 *Elevation:* 374.5			*Sheet:* 1 of 1
Drilling Method: direct push macro core			*Monitoring Well Installed:* Y N
Sample Type(s):	*Boring Diameter:* 2 in.		*Screened Interval:*
Weather:	*Logged By:* JDF	*Date/Time Started:* 12/10/04	*Depth of Boring:* 4 feet
Drilling Contractor: Parratt-Wolff		*Date/Time Finished:* 12/10/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	Recovery (in. or ft.)	(Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth
0				1.1			FILL	SS-4A	0-2'
1									
2					1.2		Gray SILT and Clay, wet, with brown mottles.	SS-4B	2-4'
3					12				
4					8		SS-4A, SS-4B sampled at 15:50 Boring terminated at 4'.		
5									
6									
7									
8									
9									
10									

NOTES:

Date	Time	Depth to groundwater while drilling

Checked by Karl Nim Date: 02/10/05

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating		**BORING ID:** SS-5
Project Number: 10160-004			
Site Location: Syracuse, NY			*Sheet:* 1 of 1
Coordinates: Northing: 1126467.2 Easting: 935943.7	*Elevation:* 375.3		*Monitoring Well Installed:* Y N
Drilling Method: direct push macro core		*Boring Diameter:* 2 in.	*Screened Interval:*
Sample Type(s):		*Date/Time Started:* 12/10/04	*Depth of Boring:* 4 feet
Weather:	*Logged By:* JDF	*Date/Time Finished:* 12/10/04	*Water Level:*
Drilling Contractor: Parratt-Wolff			

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	Recovery (in. or ft.)	(Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth
0				1.1'	5.9		0-0.6 – FILL	SS-5A	0-2'
							0.6-0.95 – Dark brown Silty CLAY with light brown mottles, wet.	SS-5A MS	0-2'
1								SS-5A MSD	0-2'
							0.95-2 – Medium brown Silty CLAY, wet.		
2							SAA.	SS-5B	2-4'
3									
							SS-5A, SS-5AMS/MSD, SS-5B collected at 15:10.		
4							Boring terminated at 4'		
5									
6									
7									
8									
9									
10									

NOTES:

Date	Time	Depth to groundwater while drilling

Checked by Karl Rainey Date: 12/10/04

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating	**BORING ID:**	
Project Number: 10160-004		**MW-01**	
Site Location: Syracuse, NY			
Coordinates: Northing: 1126471.9 Easting: 936088.9 *Elevation:* 378.85 ft.		*Sheet:* 1 of 1	
Drilling Method: HSA, spoon		*Monitoring Well Installed:*	Y N
Sample Type(s):	*Boring Diameter:* 8 ¼ in.	*Screened Interval:*	4.3-14.3
Weather:	*Logged By:* KDR	*Date/Time Started:* 12/09/04	*Depth of Boring:* 14.3
Drilling Contractor: Parratt-Wolff		*Date/Time Finished:* 12/09/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	N	Recovery (in. or ft.)	Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth
0			0		5"	1.1		0-4" Asphalt		
1			6 4	8				Rust red brown CLAY, little Silt, trace coarse Sand, damp, moderately plastic.		
2			4 3		10"	2.3				
3			3 3	7				Dark brown organic SILT, little Clay, little Sand, trace angular Gravel, moist.		
4			4 5		18"	1.8				
5			6 5	10				Rust brown CLAY, some Silt, trace medium Sand, trace Gravel, wet, moderately plastic.		
6			5 5		6"	1.8				
7			6 6	16				SAA		
8			10 6		17"	2.5		SAA, saturated.		
9			11 18	39				Red-brown SILT, little Clay, damp to moist, trace fine Sand, trace fine Gravel.		
10			21 18		24"	1.8		Red-brown SILT, Clay and Till, trace fine Gravel.		
11			17 21	49				SAA		
12			28 21		24"	1.1				
13			18 34	63				SAA		
14			29					Boring terminated at 14'.		
15										
16										
17										
18										
19										
20										

NOTES:

Date	Time	Depth to groundwater while drilling

Checked by Karl Reiner Date: 10/02/01

ENSR INTERNATIONAL	*Client:* Hancock & Estabrook		**WELL ID: MW-1**
	Project Number: 10160-004		
	Site Location: Syracuse, NY	*Date Installed:*	12/9/2004
	Well Location: North side of building. *Coords:* Northing: 1126471.9 Easting: 936088.9	*Inspector:*	KDR
	Method: HSA, split spoons for sample collection	*Contractor:*	Parratt-Wolff

MONITORING WELL CONSTRUCTION DETAIL

	Depth from G.S. (feet)	Elevation(feet)
Ground Elevation	0.0	378.9
Top of Flush Mount	0.05	378.85
Top of PVC casing	0.3	378.55

Riser Pipe:
- Length: 4.3
- Inside Diameter (ID): 2"
- Type of Material: Schedule 40 PVC

Top of Bentonite	1	377.9
Bentonite Seal Thickness: 2'		
Top of Sand	3	375.9
Top of Screen	4.5	374.4
▲ Stabilized Water Level		

Screen:
- Length: 9.7'
- Inside Diameter (ID): 2"
- Slot Size: 10 Slot (0.010 inch)
- Type of Material: Schedule 40 PVC

- Type/Size of Sand: 1
- Sand Pack Thickness: 11.3

Bottom of Screen	14.1	364.8
Bottom of Tail Pipe:	14.3	364.6
Bottom of Borehole	14.3	364.6

Borehole Diameter:

Approved: Signature

02/10/05 Date

Describe Measuring Point:

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating		**BORING ID:** MW-02
Project Number: 10160-004			
Site Location: Syracuse, NY			
Coordinates: Northing: 1126394.0 Easting: 936051.4	*Elevation:* 375.6		*Sheet:* 1 of 1
Drilling Method: HSA, spoon			*Monitoring Well Installed:* Y N
Sample Type(s):	*Boring Diameter:* 8 ¼ in.		*Screened Interval:* 3.2-13.2
Weather:	*Logged By:* KDR	*Date/Time Started:* 12/09/04	*Depth of Boring:* 13.4
Drilling Contractor: Parratt-Wolff		*Date/Time Finished:* 12/09/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	N	Recovery (in. or ft.)	(Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth
0			3		6"	2.6		0-4" – Asphalt.		
1			4	8				4"-2' – Dark brown fine to medium SAND, damp to wet.		
2			4		2'	3.3				
			3							
3			1	3				2-2.5' – SAA		
4			2		2'			2.5'-4' – Dark brown to black fine SAND and Silt, organic, wet.		
			6							
5			5					Brown Clayey SILT, moderately plastic, trace medium Sand, trace coarse Sand, damp to wet.		
			3	7						
6			4		2'					
			7							
7			18					Rust red to brown SILT, some Clay, little fine Sand, trace fine sub-rounded Gravel, damp, slightly plastic, Till.		
			24	55						
8			31		13"					
			19							
9			23					Brown Silty fine SAND, little Clay, slightly plastic, trace fine Gravel. Till.		
			21	42						
10			21		18"					
			21							
11			30					SAA		
			34	74						
12			40							
			21							
13			30	80				SAA		
			50			0.4		Boring terminated at 13.4'.		
14										
15										
16										
17										
18										
19										
20										

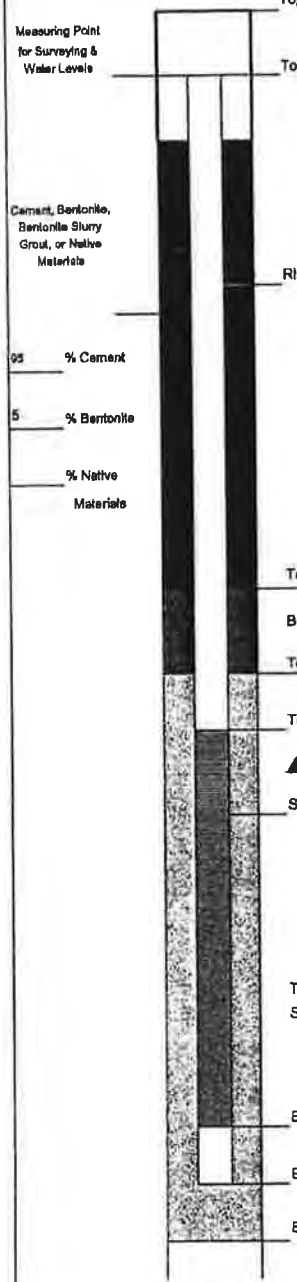
NOTES:

Date	Time	Depth to groundwater while drilling

Checked by: [signature] Date: 02/10/05

ENSR INTERNATIONAL	*Client:* Hancock & Estabrook		**WELL ID: MW-2**
	Project Number: 10160-004		
	Site Location: Syracuse, NY		*Date Installed:* 12/9/2004
	Well Location: North side of building. *Coords:* Northing: 1126394.0 Easting: 936051.4		*Inspector:* KDR
	Method: HSA, spoons		*Contractor:* Parratt-Wolff

MONITORING WELL CONSTRUCTION DETAIL



		Depth from G.S. (feet)	Elevation(feet)
Ground Surface		0.0	375.8
Top of Flush Mount		0	375.62
Top of PVC Casing		0.2	375.40
Riser Pipe:			
Length	3.4		
Inside Diameter (ID)	2"		
Type of Material	Schedule 40 PVC		
Top of Bentonite		1	374.62
Bentonite Seal Thickness	1.5		
Top of Sand		2.5	373.12
Top of Screen		3.2	372.42
▲ Stabilized Water Level			
Screen:			
Length	9.7		
Inside Diameter (ID)	2"		
Slot Size	10 Slot (0.010 inch)		
Type of Material	Schedule 40 PVC		
Type/Size of Sand	0		
Sand Pack Thickness	10.9		
Bottom of Screen		13.2	362.42
Bottom of Tail Pipe:		13.4	362.22
Bottom of Borehole		13.4	362.22

Borehole Diameter:

Approved: Signature

02/10/05 Date

Describe Measuring Point:

ENSR INTERNATIONAL

Soil Boring Log

Client: Hancock & Estabrook	*Project:* National Plating	**BORING ID:**	
Project Number: 10160-004		**MW-03**	
Site Location: Syracuse, NY			
Coordinates: Northing: 1126405.3 Easting: 935913.4 *Elevation:* 373.73		*Sheet:* 1 of 1	
Drilling Method: HSA, spoon		*Monitoring Well Installed:*	Y N
Sample Type(s):	*Boring Diameter:* 8 ¼ in.	*Screened Interval:*	3.9-13.8
Weather:	*Logged By:* KDR	*Date/Time Started:* 12/09/04	*Depth of Boring:* 13.7
Drilling Contractor: Parratt-Wolff		*Date/Time Finished:* 12/09/04	*Water Level:*

Depth (feet)	Geologic sample ID	Sample Depth (ft)	Blow Count (per 6-inches)	N	Recovery (in. or ft.)	Headspace (ppmv)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sample Depth
0 – 1			4 4 6 5	10	8"	2.7		Dark brown very fine SAND, little Silt, trace coarse Gravel, wet, trace organics (roots).		
2 – 3			2 2 2 1	4	11"	4.6		Black saturated fine SAND, little Silt, trace coarse Gravel.		
4 – 5			4 4 3 4	7	7"	3.2		Brown organic SILT, trace Clay, trace fine Sand, trace roots.		
6 – 7			5 3 3 3	6	0"	NA		0" recovery.		
8 – 9			2 2 2 2	4	0"	NA		0" recovery.		
10 – 11			7 6 5 5	11	2"	4.6		Black organic SILT, trace fine Sand.		
12 – 13 – 14			6 5 5 2	10				Grey-brown clayey SILT, saturated, non-plastic. Boring terminated at 14'.		
15 – 16 – 17 – 18 – 19 – 20										

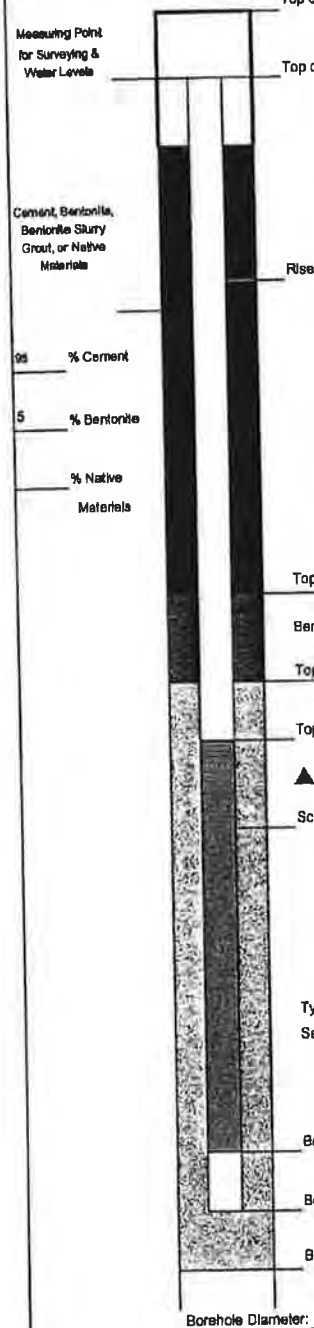
NOTES:

Date	Time	Depth to groundwater while drilling

Checked by: [signature] Date: 02/10/05

ENSR INTERNATIONAL	*Client:* Hancock & Estabrook	**WELL ID: MW-3**
	Project Number: 10160-004	*Date Installed:* 12/9/2004
	Site Location: Syracuse, NY	*Inspector:* KDR
	Well Location: North side of building. *Coords:* Northing: 1126405.3 Easting: 935913.4	*Contractor:* Parratt-Wolff
	Method: HSA, spoons	

MONITORING WELL CONSTRUCTION DETAIL



	Depth from G.S. (feet)	Elevation(feet)
Ground Surface	0	373.7
Top of Flush Mount	0	373.70
Top of PVC Casing	0.3	373.40
Riser Pipe:		
Length: 3.7		
Inside Diameter (ID): 2"		
Type of Material: Schedule 40 PVC		
Top of Bentonite	1	372.7
Bentonite Seal Thickness: 1.5		
Top of Sand	2.5	371.2
Top of Screen	3.9	369.8
▲ Stabilized Water Level		
Screen:		
Length: 9.7		
Inside Diameter (ID): 2"		
Slot Size: 10 Slot (0.010 inch)		
Type of Material: Schedule 40 PVC		
Type/Size of Sand: 0		
Sand Pack Thickness: 11.2		
Bottom of Screen	13.6	360.1
Bottom of Tail Pipe:	13.7	360
Bottom of Borehole	13.7	360

Borehole Diameter: ____

Approved: Karl Ronn
Signature

02/16/04
Date

Describe Measuring Point:

APPENDIX F – FIELD SAMPLING PLAN

Field Sampling Plan

Former National Plating Company, Inc.
Syracuse, New York
Site No. V00264

Objectives of the Sampling Plan

The objectives of this Sampling Plan are to monitor groundwater conditions at the site as well as on-site soils prior to any disturbance.

Sampling Protocols

To accomplish the previously listed objectives, the following protocols will be followed:

1. Prior to any disturbance of site soils, the NYSDEC Project Manager will be notified in accordance with the Excavation Work Plan (EWP) included in the approved Site Management Plan (SMP). Following NYSDEC approval, the excavation will proceed following the soil screening and management procedures included in the EWP. If requested by the Department soil samples may be collected for laboratory analyses. Soil samples will be screened with a photoionization detector (PID) and visually inspected by an environmental professional. Soil samples may be submitted to a New York State approved environmental laboratory (Laboratory) for analysis of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) via USEPA Methods 8020/8021 and 8270, respectively. In addition, the samples may be analyzed for other parameters requested by the Department. Sample points will be staked and surveyed to document the locations.

2. In accordance with Section 3.4 of the SMP, groundwater monitoring will be performed annually to assess the performance of the remedy. The designated wells will be sampled, and the ground water samples will be submitted to an approved laboratory for analysis in accordance with the Quality Assurance Project Plan (QAPP) included in the SMP.

Methods

Installation of Borings. If required in the future, soil borings will be completed within unconsolidated materials to the water table using direct-push drilling methods. Soil samples will be collected continuously at each boring from the ground surface to the end

depth (assumed to be 15 ft). Each soil sample will be screened in the field using a PID to assess if VOCs are present in the soil and a boring log will be prepared. One unsaturated soil sample will be collected for analysis. The sample will be selected based on visual inspection and field monitoring results.

Installation of Monitoring Wells. If a new or replacement well should be required, the well will be set approximately 7 ft below the water table. It is assumed that the monitoring well will be completed within unconsolidated materials to a maximum depth of 20 ft. The boring for the installation of the monitoring well will be completed using conventional hollow stem auger drilling methods using a minimum 4.25-inch inside diameter auger. The monitoring well will be constructed of a ten-foot length of 2-inch diameter PVC well screen attached to a PVC riser casing. The well screen will be positioned to straddle the water table; however, the top of the well screen will be positioned no less than 3 ft below grade to allow for the placement of an adequate annular seal. The well will be completed with above-grade protective casings.

Any new wells will be developed following installation to remove fine-grained sediment that may have settled in the borehole during drilling and to increase the hydraulic connection between the well and the aquifer. New wells will be developed until evacuated water is visually clear and free of sediment, monitoring parameters have stabilized, and a minimum of three well volumes have been removed. Monitoring parameters will include pH, conductivity, temperature, and turbidity, and will be considered stabilized when they vary less than 10 percent between three successive readings taken at least three minutes apart. Turbidity will be reduced to less than 50 NTU, if attainable. Water generated during the well development will be contained pending characterization and disposal.

Ground water samples will be collected from designated wells and placed in a cooler for delivery to the laboratory for analysis. Ground water samples will be collected using low-flow purging and sampling techniques, as specified in USEPA's "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures," and using peristaltic pumps. Field measurements of pH, conductivity, turbidity, dissolved oxygen, redox potential, and

temperature will be made during evacuation and prior to collection of the sample. Monitoring parameters will be considered stabilized when three successive readings are within ± 0.1 for pH, ±3% for conductivity, ±10 mv for redox potential, and ± 10% for turbidity and dissolved oxygen. Turbidity will be reduced to less than 50 NTU if the field geologist feels this level is attainable.

Decontamination. The drilling equipment will be decontaminated following completion of each boring or well using high-pressure hot water or steam. Decontamination procedures will take place on a temporary decontamination pad constructed of plastic sheeting on-site. Water generated during the decontamination procedures will be contained in 55-gallon drums for off-site disposal.

Survey. Elevations and locations of new monitoring wells will be surveyed to provide information pertaining to the ground water flow direction. The survey will be referenced to a USGS datum or a pre-established on-site benchmark. The location and elevations (ground surface, PVC casing, steel casing) of the monitoring wells will be surveyed.

Investigation Derived Waste (IDW). Drill cuttings will be managed in accordance with NYSDEC's TAGM 4032 – Disposal of Drill Cuttings. IDW water will be collected in drums and will be left on the site in the location that they are generated. Upon receipt of the analytical data, the water will either be released on site to a permeable ground surface to allow infiltration or will be disposed offsite at a permitted facility in accordance with applicable regulations.

Underground Utilities. The drilling contractor will contact the local underground facilities protective organization to locate utilities at the site prior to initiating the field program. The utilities will only identify the locations of subsurface lines on public property and rights-of-way. The location of on-site utilities will be reviewed with the site owner to approve the locations where drilling will take place.

Health and Safety. A Health and Safety Plan (HASP) has been prepared for the site and is included in the SMP.

Report

Following receipt of the analytical results, a report will be prepared documenting the sampling events and presenting the analytical data as compared with the cleanup objectives listed in the 6 NYCRR Part 375 and NYSDEC ground water standards. The report will contain:

- a description of the field activities that were performed, including modifications to this plan and the reasons for those modifications
- a description of the analytical data developed by the program
- an evaluation of the data obtained to date with respect to applicable criteria
- conclusions regarding the necessity for remediation
- recommendations for remedial activities, if appropriate
- boring logs, sample location maps, and analytical data sheets will be appended to the report, as will other information as appropriate.

APPENDIX G – QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

for the

FORMER NATIONAL PLATING COMPANY
1501 Brewerton Road
Town of Salina
Onondaga County, New York

Prepared for:

D.J.H. REALTY CORP.
747 West Manlius Street
East Syracuse, New York 13057

Prepared by:

PLUMLEY ENGINEERING

8232 Loop Road
Baldwinsville, New York 13027
(315) 638-8587
Project No. 2010150

December 2017

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ATTACHMENTS

1.0 INTRODUCTION

Plumley Engineering, P.C. has developed this Quality Assurance Project Plan (QAPP) for the Site Management Plan (SMP) for the Former National Plating Company site in the Town of Salina, Onondaga County, New York on behalf of D.J.H. Realty Corp. This QAPP is to be used in conjunction with the SMP.

The QAPP provides quality assurance/quality control (QA/QC) criteria for work efforts associated with sampling and analysis of environmental media at the site. This QAPP has been prepared using United States Environmental Protection Agency (EPA) 2006a *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* as guidance.[1]

The QAPP will assist in generating data of a known and acceptable level of precision and accuracy. It provides information regarding the project description and personnel responsibilities and sets forth specific procedures to be used during sampling of environmental media, other field activities and laboratory analyses. Personnel participating in the field investigation and laboratory analyses will follow the procedures in this QAPP. The following QA topics are addressed or referenced in this document:

- Project organization and responsibilities.
- Project background.
- Project description.
- Data quality objectives (DQOs) and criteria.
- Special training requirements.
- Documentation.
- Sampling design.

[1]EPA QA/R-5. Washington, D.C.

- Sampling method requirements.
- Sample handling and custody.
- Analytical method requirements.
- QC requirements.
- Instrumentation/equipment testing and maintenance.
- Calibration and frequency.
- Inspection requirements for supplies.
- Data acquisition requirements.
- Data management.
- Assessment and response actions.
- QA reports to management.
- Data review and management.
- Reconciliation with user requirements.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

2.1 Project Participants

While each person involved in the generation of data is implicitly part of the QA program for the project, certain individuals have specific, designated responsibilities. Within Plumley Engineering these are the Project Officer, Project Manager, QA Officer, Field Leader, Data Management Personnel and Sampling Personnel.

SGS Laboratories, Inc. (SGS) will provide analytical services for the SMP. Laboratory personnel with QA/QC responsibilities include the Laboratory Project Manager and Laboratory Sample Custodian.

Samples will not be sent to a laboratory that is not listed in this QAPP without the permission of the Plumley Engineering Project Manager.

The following sections describe the relationship among the project participants.

2.2 DEC Project Manager

New York State Department of Environmental Conservation (DEC) has assigned Michael Belveg as the Project Manager for the site. As such, he will be responsible for reviewing submissions and overseeing project activities on behalf of DEC.

2.3 D.J.H. Realty Project Manager

Dennis Hile is the D.J.H. Realty Project Manager for the site. As such, he will be responsible for reviewing submissions and overseeing project activities on behalf of the company.

2.4 Plumley Engineering Personnel

2.4.1 Project Officer

Dale R. Vollmer, P.E. will serve as the Project Officer. As such, he will be responsible for the overall corporate management of the SMP and for the completion of tasks specified in the Plan and QAPP. It will be his responsibility to provide for the allocation of staff and other resources required to complete the project within the specified schedule and budget.

2.4.2 Project Manager

David K. Meixell, P.E. will serve as the Project Manager and client contact. As such, he will have responsibility for the implementation and completion of each of the tasks

identified in the SMP and QAPP. He will manage the day-to-day project operations and administrative aspects of the project and will function as the client and regulatory contact for the project. In addition, he will be responsible for coordinating the technical aspects, strategy and field sampling activities.

2.4.3 QA Officer

Derk T. Hudson will serve as the QA Officer. As such, he will be responsible for overall project QA. He will review project plans and revisions to such plans to maintain proper QA throughout the SMP. In addition, the QA Officer or designee will be responsible for performance and system audits, data quality review, corrective actions and coordinating QA/QC efforts between Plumley Engineering and the laboratory.

2.4.4 Field Leader

Derk T. Hudson will also serve as the Field Leader. As such, he will oversee field and related activities as described in this QAPP. The sampling personnel will report to the Field Leader, who will be responsible for leading, coordinating and supervising the day-to-day field activities. The Field Leader's responsibilities include:

- Communicate and coordinate with the laboratory prior to sample collection and during shipment of sample coolers to the laboratory.
- Develop and implement field-related sampling plans and schedule.
- Coordinate and manage field staff.
- Supervise or act as the field sample custodian.
- Implement QC for technical data, including field measurements.
- Adhere to work schedules.
- Coordinate and oversee technical efforts of subcontractors assisting the field team.

- Identify problems at the field team level and resolve difficulties.

- Implement and document corrective action procedures.

2.4.5 Data Management Personnel

Data management staff from Plumley Engineering will provide data management services.

2.4.6 Sampling Personnel

Experienced engineers, geologists, hydrogeologists and/or environmental technicians will conduct sampling tasks required by the SMP. Their responsibilities will include the documentation of proper sample collection protocols, sample collection, equipment decontamination and chain of custody documentation. The sampling personnel will report to the Field Leader.

2.5 Laboratory Personnel

2.5.1 Project Manager

Kelly Patterson of SGS will serve as the Laboratory Project Manager. As such, she will be responsible for the laboratory's QA/QC activities associated with the project. The specific duties of the Laboratory Project Manager include determining whether analyses are conducted within the method requirements and that laboratory custody procedures are followed. Moreover, the Laboratory Project Manager monitors daily precision and accuracy records, maintains detailed copies of all procedures, reschedules analyses based on unacceptable data accuracy or precision, and identifies and implements corrective actions necessary to maintain QA standards.

The Laboratory Project Manager or designee will conduct initial data assessments of analytical data results, based on the requirements of the QAPP, and report the findings in the data packages. Major QA/QC issues will be reported to the QA Officer.

2.5.2 Laboratory Sample Custodian

Derrick Church of SGS will serve as the Laboratory Sample Custodian. As such, his responsibilities will include verifying proper sample entry and sample handling procedures by laboratory personnel. The Laboratory Sample Custodian will report to the Laboratory Project Manager.

3.0 PROJECT BACKGROUND AND DEFINITION

3.1 Project Background

The Former National Plating site entered into the Voluntary Cleanup Program (VCP) and was assigned #V00264. A site investigation was completed and a remedial excavation was conducted to remove subsurface contamination associated with a former floor sump.

The property is approximately one acre in size and bounded by Paratore Signs to the north, the former Town of Salina landfill to the south and west, and Brewerton Road to the east.

3.2 Project Definition

The property has been remediated as detailed in the SMP. Existing groundwater monitoring wells will be sampled periodically for analysis of volatile organic compounds (VOCs) as part of the future management of the property.

4.0 PROJECT DESCRIPTION AND SCHEDULE

4.1 Project Description

4.1.1 Overview

Groundwater will be monitored on an annual basis as part of the SMP. Analytical methods to be utilized are listed in Attachment 1.

4.1.2 Sample Analysis

SGS will provide analytical services for the SMP monitoring.

Analyses will meet the requirements of the methods listed in Attachment 1, the QC requirements and corrective actions listed in Attachments 2 and 3, and additional requirements listed in this QAPP. Laboratory control limits will be the most recent laboratory control limits for accuracy and precision.

The laboratory will report non-detect sample results to the quantitation limits (QLs). Organic results that are less than the QLs but greater that the method detection limits (MDLs) will be reported by the laboratory using the "J" flag. The most recent MDLs and QLs will be reported by the laboratory. The attachments also present the applicable screening criteria that will be used to evaluate analytical data.

Samples may be diluted only if analytes of concern generate responses in excess of the linear range of the instrument.

Samples will undergo cleanup procedures where matrix interference prevents accurate quantification and identification of target analytes. In such a case, samples will be cleaned up during the processes from appropriate methods. Interferences will be identified and documented. The cleanup, extraction and sample preparation methods will be listed in the data package case narrative. If the laboratory has taken appropriate actions and matrix interferences prevent the laboratory from achieving the specified QLs, the Plumley Engineering QA Officer will be contacted as soon as the situation is identified. The Laboratory Project Manager will document, in the data package case narrative, how the laboratory demonstrated good analytical practices in order to attempt to achieve the specified QLs.

The lowest initial calibration standard will establish the QLs for each analysis reported by the laboratory.

4.1.3 Data Packages

The data results will be reported to the Plumley Engineering Project Manager using Contract Laboratory Program (CLP)-like deliverables format. The complete data packages will also be provided in electronic PDF format.

Documentation of communications between the laboratory and the Plumley Engineering Project Manager or QA Officer will be provided in the data packages.

The laboratories will provide one electronic copy of the data packages within four weeks of receipt of the last sample in a sampling event. Field logs, data packages and records will be included in the project file which will be archived by Plumley Engineering for a period of 10 years.

4.1.4 Audits

A field or laboratory audit may be performed at the discretion of the Plumley Engineering Project Manager. Additional audits may be required if issues that would severely limit the use of the sample data are identified. Corrective action procedures will be implemented based on unacceptable audit results, as defined herein.

5.0 DATA QUALITY OBJECTIVES AND CRITERIA

5.1 Objectives

Data quality objectives (DQOs) are quantitative and qualitative statements specifying the quality of the environmental data required to support the decision-making process. DQOs define the total acceptable uncertainty in the data for each specific activity conducted during the SMP. The uncertainty includes both sampling error and analytical error. Ideally, zero uncertainty is the intent. However, the variables associated with the process (field and laboratory) inherently contribute to the uncertainty of the data. It is the overall objective to keep the total uncertainty within an acceptable range that will not hinder the intended use of the data.

QA/QC represents a set of procedures designed to produce analytical data of known and acceptable quality. The distinction between QA and QC programs is as follows: the QA program ensures that all information, data and decisions resulting from the SMP are technically sound and properly documented, while the QC program assures that the QA program achieve its goals. QA/QC requirements have been established for this SMP so there will be a high degree of confidence in the measurements.

The DQOs that will be addressed by the SMP are based on the following factors that define the scope of the SMP:

- History of site operations and areas of suspected impacts
- Remediation of impacted soil
- Assessment of data from the excavated areas
- Disposal of excavated soils

The following DQO statements were developed during the development of the Work Plan:

- Were the groundwater results in exceedence of New York State Class GA standards?
- Were the soil results in exceedence of the soil cleanup objectives (SCOs) listed in New York Codes, Rules and Regulations, Title 6 (6NYCRR), Part 375?

Analytical levels as defined by EPA are as follows:

- *Screening Data* are generated by rapid, less precise methods of analysis with less rigorous sample preparation. Sample preparation steps may be restricted to simple procedures such as dilution with a solvent, instead of elaborate extraction/digestion and cleanup. Screening data provide analyte identification and quantitation, although the quantitation may be

relatively imprecise. Screening data without associated confirmation data are not considered to be data of known quality. Field screening for VOCs by photoionization detection (PID) meter were conducted during the Remedial Investigation (RI).

- *Definitive Data* are generated using rigorous analytical methods, such as EPA reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce tangible raw data in the form of paper printouts or computer-generated electronic files. Data may be generated at the site or at an offsite location, as long as the QA/QC requirements are satisfied. For the data to be definitive, either analytical or total measurement error must be identified. The level of QC that will be performed for the definitive data involves the QC efforts described in Section 12, calibration procedures described in Section 14, analytical methods listed in Attachment 1 and QC requirements and corrective actions listed in Attachments 2 and 3.

Plumley Engineering has developed the QA/QC program described in this QAPP in order to assess adherence to DQOs. The remainder of this QAPP describes the specific approaches that will be taken to achieve the required DQOs.

Precision describes the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements that have been made in an identical manner, compared to their average value. Precision can be expressed in a variety of manners, including absolute methods such as deviation from the mean or median values, standard deviation and variance, or relative methods such as relative deviation from the mean or median. The overall precision will be determined through the analysis of field duplicates, laboratory duplicates and matrix spike/matrix spike duplicate (MS/MSD) samples.

Accuracy is defined as the degree of difference between measured or calculated values and the true value. The closer the numerical value of the measurement comes to the true value, or actual concentration, the more accurate the measurement is. Accuracy is expressed in terms of absolute or relative error. Accuracy will be determined through analysis of spiked samples and the analysis of standards with known concentrations.

Representativeness refers to the degree to which a sample taken from a site accurately reflects the matrix at the site. It is a qualitative parameter that is most concerned with the design of the sampling program. Factors that should be considered in the determination of representativeness include appropriateness of sampling and analytical methodologies, representativeness of the selected media and representativeness of the selected analytical procedures. Representativeness will be achieved by the use of procedures for the collection and preservation of samples as described in the SMP and the methods in this QAPP.

Comparability refers to the use of consistent procedures, second source reference standards, reporting units and standardized data format with document control. Adherence to standard procedures and the analysis of external source standard materials maximizes the probability that data generated from a particular method at a given laboratory can be validly compared to the data of another. This QAPP has been written to provide data that will be comparable to other data collected, as standard methods will be utilized for this SMP.

Completeness refers to the process of obtaining the required data as outlined in the SMP. Completeness is also defined as the percentage of measurements judged to be useable. Samples for which the critical data points fail completeness objectives will require reanalysis of samples (within the specified holding times) until the DQOs are met. The completeness goal has been specified at 95%.

Sensitivity refers to a measurable concentration of an analyte that has an acceptable level of confidence. MDLs are the lowest concentration of an analyte that can be measured with 99% confidence that the analyte concentration is greater than zero. QLs are levels above the MDLs at which the laboratory has demonstrated the quantitation of analytes.

5.2 Field Sampling

The objective of the field sampling program is to obtain samples that represent the environmental matrix being investigated. This will be accomplished through the use of proper sampling techniques and equipment.

Field screening activities may not require sample collection, but nonetheless involve measurements for which QA concerns are appropriate. The primary QA objective of field screening is to obtain reproducible measurements to a degree of accuracy consistent with the intended use of the measurements and to document measurement procedures.

5.3 Laboratory Analysis

SGS maintains laboratory Standard Operating Procedures (SOPs) and a Quality Assurance Manual (QAM). VOC analysis by gas chromatography/mass spectrometry (GC/MS) will be used to obtain data of a quality sufficient to meet the project DQOs.

The laboratory will adhere to the specific analyses and QA/QC requirements in the analytical methods listed in Attachment 1 and this QAPP.

6.0 SPECIAL TRAINING REQUIREMENTS

Field personnel must comply with the training requirements for hazardous waste operations in accordance with Code of Federal Regulations, Title 29 (29 CFR) 1910.120(e). Each individual must have successfully completed a 40-hour course for intrusive work and, minimally, a 24-hour course for non-intrusive work. In addition, each individual must have completed an 8-hour refresher course within the last 12 months if the initial training was more than 12 months ago.

7.0 DOCUMENTATION

This QAPP will be amended at the discretion of the Plumley Engineering Project Manager by the QA Officer, as necessary, when guidelines and regulatory documents are revised or if site requirements necessitate such changes. Whenever the QAPP is amended, the project personnel will receive the amended copy of the QAPP and outdated copies will be removed from circulation.

Field sampling operations and procedures will be documented by onsite personnel. Documentation of sampling operations and procedures may include the following:

- Procedures for preparation of reagents or supplies which become an integral part of the sample.
- Procedures for recording location and specific considerations associated with sample collection.
- Specific sample preservation method.
- Calibration of field instruments.
- Submission of field-based blanks, where appropriate.
- Potential interferences present at the site.
- Field sampling equipment and containers including specific identification numbers of equipment.
- Sampling order.
- Decontamination procedures.
- Field personnel.

The analytical data results will be reported to the Plumley Engineering Project Manager using CLP-like deliverables format. The data packages will also be provided in PDF electronic format.

A comprehensive case narrative, which describes the following, will be included in the data package:

- Cross reference list which includes field sample identification name, laboratory identification number and sample dates for each sample in the sample delivery group (SDG) included in the data package.

- Documentation of methodologies utilized to prepare and analyze samples and references.

- Detailed documentation of QC, sample shipment and analytical problems encountered in processing samples for the data package.

- Documentation of re-analyses, internal QC processes used, corrective actions taken and resolution of corrective actions taken.

- Documentation of communications made with the Plumley Engineering Project Manager and QA Officer during the data generation process.

The laboratories will provide an electronic copy of the data packages within four weeks of receipt of the last sample in a sampling event at the laboratory. Field logs, data packages, and records will be included in the project file which will be archived by Plumley Engineering for a period of 10 years.

8.0 SAMPLING DESIGN

8.1 Objectives

The objective of the sampling program is to obtain samples of environmental media of sufficient quality to support both qualitative and quantitative information to identify the nature and extent of constituents in the investigation areas.

8.2 Sampling Network

The types of parameters, methods, matrices and numbers of samples to be collected are presented in Attachment 1.

8.3 Sample Locations

Sample locations are described in the SMP.

A sample designation system will be used to identify samples for laboratory analysis. A list of identifiers used for each sample will be maintained in the project notes by the Plumley Engineering Field Team.

Each sample that is collected will be designated by a unique sample identification number. The first part of the identifier will correspond to the type of media being collected:

- DUP – field duplicate
- TB – trip blank
- FB – field blank
- MS/MSD – matrix spike/matrix spike duplicate

The sample type code will be followed by an alpha-numerical code indicating the sample location number.

Field duplicates will be identified with a unique sample identification number, such that the laboratory will not be aware that the sample is a duplicate. Field sampling personnel will note the duplicate sample in the project notes so this information will be available when the laboratory data is reviewed. An example designation for a field duplicate from a soil sampling location on the chain of custody form will be DUP-1, representing a site location that is not identified on the chain of custody record.

9.0 SAMPLING METHOD REQUIREMENTS

9.1 Sampling Procedures

The objective of the field sampling program is to obtain samples that represent the environmental matrix being investigated. This will be accomplished through the use of proper sampling techniques and equipment.

Field duplicate samples will be collected from the same location as the parent sample and will be analyzed for the same parameters as the parent sample.

The field duplicate QC samples will be labeled with fictitious identification locations and times and submitted to the laboratory as regular samples. The actual identification of the duplicate QC samples will be recorded in the field notes. One field duplicate QC sample will be collected for every 20 samples collected per matrix and sent to the laboratory for analysis.

MS/MSD samples will be collected from the same location as the parent sample and will be analyzed for the same parameters as the parent sample. Each sample will be labeled with the same number as the original sample, designated as MS or MSD, and submitted to the laboratory for the appropriate analyses. One MS and MSD sample will be collected for every 20 samples collected per matrix and sent to the laboratory for analysis.

A field blank will be prepared for sampling when a particular piece of sampling equipment is employed for sample collection and subsequently decontaminated in the field for use in additional sampling. The water used to generate the field blank will be provided by the laboratory, using the same source of water as that used to prepare method blanks. The field blank will be composed in the field by collecting, in the appropriate container for the water, a water rinse from the equipment after execution of the last step of the proper field decontamination protocol. The identical bottle to bottle transfer technique will be used to generate the field blank. Preservatives or additives will be added to the field blank, where appropriate, for the sampling parameters. One field blank will be collected per 10 samples or once per day, whichever is more conservative. The field blank will be

analyzed for the same parameters as the samples collected the same day that the field blank was generated.

A trip blank will be included in the cooler used to ship aqueous and soil samples for VOC analysis. The trip blank is designed to address possible sample contamination from transportation between the site and the laboratory. A trip blank will be prepared by the laboratory. Non-aqueous samples collected utilizing methanol preservation will require trip blanks prepared using the same technique as that used to prepare the samples containers. Trip blanks are not opened in the field, but travel with the sample containers. One trip blank will be sent to the laboratory for analysis in each cooler that contains samples that have been collected for VOCs.

9.2 Decontamination of Sampling Equipment

The sampling methods have been developed to minimize the possibility of cross-contamination. The following procedures will be used to decontaminate any non-disposable/non-dedicated sampling equipment in accordance with the following procedures, where applicable:

- Wash and scrub the equipment with non-phosphate laboratory grade detergent and potable water.
- Generous tap water rinse.
- Rinse with distilled or deionized water.
- Air dry.
- Wrap with aluminum foil or plastic sleeve for transport.

Equipment will be wrapped in aluminum foil and/or stored in disposable plastic sheeting to maintain contaminant-free conditions. Deviations from these procedures will be documented in the field notes.

10.0 SAMPLE HANDLING AND CUSTODY

10.1 Sample Preparation and Preservation

The analytical laboratory will supply appropriate sample containers in sealed cartons or coolers, as well as preservatives (as appropriate). QA measures for this project will begin with the sample containers. Pre-cleaned containers will be purchased from an EPA-certified manufacturer (I-Chem 200 or equivalent).

Samples will be transferred to properly labeled sample containers immediately after collection and properly preserved. Attachment 1 lists the proper sample container, sample volumes and preservation. Samples requiring refrigeration for preservation will be promptly transferred to coolers packed with wet ice and/or ice packs. If field storage is required, the samples will be stored in a secured storage facility and an approximate cooler temperature of 4 °C will be maintained. Samples will be shipped or transported within 24 hours of being collected and will arrive at the laboratory no later than 48 hours after sample collection. Proper chain of custody documentation will be maintained as discussed in Section 10 of this QAPP. Samples will be analyzed within the holding times specified in Attachment 1.

10.2 Sample Custody and Procedures

Samples are physical evidence and will be handled according to strict chain of custody protocols, including field custody, laboratory custody and evidence files. Documentation must be produced, when needed, that traces the samples from the field to the laboratory and through analyses. EPA has defined custody of evidence as follows:

- In actual possession.
- In view after being in physical possession.
- In a locked laboratory.
- In a secure, restricted area.

10.2.1 Field Custody Procedures

The field sampler is personally responsible for the care and custody of the sample until transferred.

Field notes will be used to note information regarding collection of samples and any notable observations. All entries will be signed and dated. Corrections will be made by drawing a single line through the incorrect data and initialing and dating the correction that was made to the side of the error. An initialed diagonal line will be used to indicate the end of an entry or the end of the day's activities.

The following information will be recorded in the field notes by the field sampling team:

- Name and title of author, date and time of site entry, and physical/environmental conditions during the field activity.
- Meteorological data.
- Project number, client name and site name.
- Name and title of field crew members.
- Sample media.
- Sample collection method, including equipment utilized.
- Number and volume of samples collected.
- Description of sample locations.
- Date and time of sample collection.
- Sample and QA/QC identification numbers.

- Field observations.
- Field measurements taken and equipment used.
- Calculations, results, and calibration data for field sampling and measurements.
- References for maps and photographs of the sample location.
- Dates and method of sample shipments.

A completed sample identification label will be attached to each investigative or QC sample and the sample placed in a shipping container. The identification on the label/tag must be sufficient to enable cross-reference with the logbook. The sample label/tag will be recorded using waterproof, non-erasable ink, and will be attached to the sample container using adhesive.

The sample labels will contain the following information:

- Sample number identification.
- Project number.
- Date and time of sample collection.
- Designation of the sample as a grab or composite.
- Type of sample matrix.
- Sample location.
- Sampler initials.
- Whether the sample is preserved or unpreserved.

Chain of custody records will be kept beginning at the time sample containers are placed in the coolers for transportation to the laboratory. One completed chain of custody record must be kept with each sample cooler at all times.

When transferring the possession of samples, individuals relinquishing and receiving will sign, date and note the time on the chain of custody. Custody of samples must be continuous between parties and time gaps must not be present. Each shipment of samples to the laboratory must have its own chain of custody record, with the contents of the shipment, method of shipment, name of courier and other pertinent information written on the record. The original record accompanies the shipment and the copies are kept with the field logbook and distributed to the Plumley Engineering Project Manager. Freight bills, postal service receipts and bills of lading will be retained as permanent documentation.

If the samples are shipped, the courier's air bill will be attached to the chain of custody and the air bill number will be written on the chain of custody form.

The chain of custody documentation will be recorded using waterproof, non-erasable ink. One sample will be entered on each line of the chain of custody record and not be split among multiple lines.

The chain of custody form will contain the following information:

- Project identification and number.
- Sample description/location.
- Required analysis.
- Date and time of sample collection.
- Type and matrix of sample.
- Number of sample containers.

- Analysis requested/comments.
- Sampler signature/date/time.
- Date and signature of the field representative.
- Date and signature of the laboratory representative.
- Carrier used to ship coolers.
- Air bill number (if shipped by a commercial carrier).

In the case that high concentrations are suspected to be present in the samples, a note to that effect will be included on the chain of custody form.

Environmental samples will be packed prior to shipment using the following procedures:

- Select a sturdy cooler in good repair and clean. Secure and tape the drain plug with fiber or duct tape.
- Be sure the lids on all bottles are tight (will not leak) and placed in tightly sealed plastic bags.
- Put ice that has been placed in properly sealed heavy-duty polyethylene bags on top of and/or between the samples. Pack samples securely to eliminate breakage during shipment, with ice packs to maintain the inside temperature at approximately 4°C.
- Place chain of custody record in a Ziploc plastic bag, tape the bag to the inner side of the cooler lid, close the cooler and securely tape (preferably with fiber tape) the top of the cooler shut. The field sampler will initial and date the seal. The seals must be broken to open the cooler and will indicate tampering if the seal is broken before receipt at the laboratory. Two custody seals will be affixed to the latch and lid of the cooler. The custody seals will consist of adhesive-backed tape that easily rips if it is disturbed.

- A label containing the name and address of the shipper will be placed on the outside of the cooler.

The field sampling team will transport or ship the cooler via an overnight delivery service or hand deliver to the laboratory. The field sampling team will contact the laboratory to notify the laboratory of the shipment prior to shipment of sample coolers.

Samples will remain in the custody of the sampler until transfer of custody is completed. Transfer consists of:

- Delivery of samples to the Laboratory Sample Custodian, and/or

- Signature of the Laboratory Sample Custodian on the chain of custody form as receiving the samples and signature of sampler as relinquishing the samples.

10.2.2 Laboratory Custody Procedures

When the samples arrive at the laboratory, the Laboratory Sample Custodian will sign the courier's air bill or bill of lading (unless hand-delivered) and will note the cooler temperature on the chain of custody form. If the cooler temperature is greater than 6 °C, the Plumley Engineering Project Manager will be notified. If the cooler arrives at the laboratory after hours, an external chain of custody form will be properly filled out and will accompany the cooler until the laboratory receives the cooler.

The Laboratory Sample Custodian's duties and responsibilities upon sample receipt will be to:

- Document receipt of samples by signing the record with the date and time of sample receipt.

- Note the cooler temperature on the chain of custody form.

- Inspect sample shipping containers for the presence or absence of custody seals (only if shipped via overnight courier) and for container integrity.

- Sign the appropriate forms or documents, verify and record the agreement or disagreement of information on sample documents and, if there are discrepancies, record the problem and notify the Plumley Engineering Project Manager.

- Assign a laboratory number for each sample upon receipt. That unique, sequential laboratory sample number will be placed on the sample label which will remain attached to the sample container.

- Log sample information into the laboratory sample tracking system.

- Place samples in the walk-in cooler or sample storage area that is a secure, limited-access storage.

The laboratory will immediately contact the Plumley Engineering Project Manager if issues pertaining to sample condition or documentation are detected (broken security seal, broken, open or otherwise compromised sample bottles, chain of custody information in disagreement with sample labels, etc.).

At the laboratory, the analysts will be required to log samples and extracts in and out of storage as the analysis proceeds. Samples and extracts will be returned to secure storage at the close of business. Written records will be kept of each time the sample or extract changes hands. Care must be exercised to properly complete, date and sign items needed to generate data.

Procedures to be followed by the laboratory include:

- Samples will be handled by the minimum number of people possible.

- The laboratory will set aside a secured sample storage area consisting of a clean, dry, refrigerated, isolated room.

- A specific person will be designated sample custodian. Incoming samples will be received by the custodian who will indicate receipt by signing the chain of custody form.

- The custodian will ensure that samples which are heat-sensitive, light-sensitive, radioactive or which require special handling in other ways, are properly stored and maintained prior to analysis.

- The analytical area will be restricted to authorized personnel only.

- After sample analyses are complete, the analytical data will be kept secured and released to authorized personnel only.

If QC samples have not been properly identified during sample collection, the Laboratory Project Manager will contact the Plumley Engineering Project Manager to assign QC samples prior to the start of sample analysis.

10.2.3 Final Evidence File Chain of Custody Procedures

The final evidence file will be the central repository for documents that constitute evidence relevant to sampling and analysis activities as described in this QAPP. Plumley Engineering is the custodian of the evidence file and maintains the contents of evidence files for the site including relevant records, reports, logs, field notebooks, pictures, subcontractor reports and data reviews.

The final file will be stored at Plumley Engineering and will consist of the following:

- Laboratory data packages including summary and raw data from the analysis of environmental and QC samples, chromatograms, mass spectra, calibration data, work sheets and sample preparation log.

- Chain of custody records.

- Field logbooks and data.
- Pictures and drawings.
- Correspondence.

The evidence file will be maintained in a secured, limited access area until submittals for the project have been reviewed and approved, and for a minimum of 10 years past the submittal date of the final report.

11.0 ANALYTICAL METHOD REQUIREMENTS

11.1 Analytical Methods

The laboratory will utilize the analytical methods and additional requirements listed in this QAPP. The most recent laboratory control limits for accuracy and precision will be used to evaluate the sample data. In addition, the QC requirements and corrective actions listed in Attachments 2 and 3, which augment the method requirements, will be followed by the laboratory. In the event of an analytical system failure, the Laboratory Project Manager will identify the situation and provide corrective action guidance. The Plumley Engineering QA Officer will be notified and the situation will be documented in the data package case narrative.

MDLs and QLs may only be achieved in an undiluted sample free of matrix interferences or of high concentrations of target analytes. If matrix interferences are encountered or if high concentrations of target compounds are present, established MDLs and QLs may not be achievable without impacting the instrument quality. The laboratory and Plumley Engineering QA Officer will discuss these situations before the laboratory proceeds with sample analysis.

Samples may be diluted only if analytes of concern generate responses in excess of the linear range of the instrument.

Samples will undergo cleanup procedures for the following situations:

- For solid samples analyzed for SVOCs with QLs that are elevated above the action limits due to matrix interferences.

- Where matrix interference prevents accurate quantification and identification of target analytes.

When the previously described situations occur, samples will be cleaned up during the processes from appropriate methods. Interferences will be identified and documented. The cleanup, extraction and sample preparation methods will be listed in the data package case narrative.

If the laboratory has taken appropriate actions and matrix interferences prevent the laboratory from achieving the specified QLs, the Plumley Engineering QA Officer will be contacted as soon as the situation is identified. The Laboratory Project Manager will document, in the data package case narrative, how the laboratory demonstrated good analytical practices in order to attempt to achieve the specified QLs.

Blanks will not be subtracted from target analyte results.

11.2 Detection Limits

The MDL is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte. The QL is the lowest concentration that can be reliably quantified within specified limits of precision and accuracy during routine laboratory operations.

The lowest initial calibration standard will establish the QLs for each analysis reported by the laboratory. The laboratory will report non-detect sample results to the QLs. Results that are less than the QLs but greater that the MDLs will be reported by the laboratory using the "J" flag. The most recent MDLs and QLs will be reported by the laboratory.

Detection limits may only be achieved in an undiluted sample free of matrix interferences or of high concentrations of target analytes. If matrix interferences are encountered or if high concentrations of target compounds are present, established MDLs and QLs may not be achievable without impacting the instrument quality. The laboratory and Plumley Engineering QA Officer will discuss these situations before the laboratory proceeds with sample analysis.

12.0 QC REQUIREMENTS

The overall effectiveness of a QC program depends on operating in the field and laboratory according to a program that systematically ensures the precision and accuracy of analyses by detecting errors and preventing their recurrence or measuring the degree of error inherent in the methods applied. The following sections describe the QA/QC checks that will be utilized in the laboratory and the field.

12.1 Laboratory QA/QC Checks

Attachments 2 and 3 summarize the laboratory QC checks, frequency of analysis, control limits and laboratory corrective actions for the analytical methods. A brief description of laboratory QA/QC analyses is contained in the following subsections.

12.1.1 GC/MS Tuning

Tuning and performance criteria are established to verify mass resolution, identification and to some degree, instrument sensitivity. These criteria are not sample specific; conformance is determined using standard materials. Therefore, these criteria should be met in all circumstances.

12.1.2 Calibration

Compliance requirements for satisfactory instrument calibration are established to verify that the instrument is capable of producing acceptable quantitative data. Initial calibration

demonstrates the instrument is capable of acceptable performance at the beginning of analysis, and continuing calibration and performance checks document satisfactory maintenance and adjustment of the instrument on a day-to-day basis. Section 14 of this QAPP describes the laboratory equipment calibration process.

12.1.3 Blanks

Several types of blanks will be analyzed by the laboratory. Corrective action procedures will be implemented for blank analyses if target compounds are detected at concentrations greater than the QL, where applicable. The criteria for evaluation of blanks apply to any blank associated with a group of samples. If problems with a blank exist, data associated with the project must be carefully evaluated to determine whether or not there is an inherent variability in the data for the project or if the problem is an isolated occurrence not affecting other data.

A method blank is an analyte-free blank that undergoes the preparation procedures applied to a sample. These samples are analyzed to examine whether sample preparation and analysis techniques result in sample contamination. The laboratory will prepare and analyze a method blank with each group of a maximum of 20 samples that are extracted, digested or analyzed at the same time.

Field blanks are analyzed to assess contamination introduced during field sampling procedures and sample shipment, respectively. Field blanks will consist of samples of analyte-free water that are passed through and/or over decontaminated sampling equipment. One field blank will be collected per set of sampling equipment per sampling event. Field blanks will not be required if dedicated sampling equipment is utilized. The water that is used for the field blank will be provided by the laboratory from the same source as that used for the laboratory method blank. If the water is stored prior to use, an aliquot from the source of water and the storage container will be analyzed prior to use. The field blank samples will be subject to the same analyses as the environmental samples. One field blank will be collected per 10 samples or once per day, whichever is more conservative.

A trip blank will be prepared by the laboratory. Non-aqueous samples collected utilizing methanol preservation will require trip blanks prepared using the same technique as that used to prepare the samples containers. The trip blank will undergo shipment from the sampling site to the laboratory in coolers with the environmental samples to be analyzed for VOCs. Trip blanks will be analyzed for VOCs to determine if contamination has taken place during sample handling and/or shipment. Trip blanks will be utilized for samples at a frequency of one each per shipment of samples sent to the laboratory for VOCs.

12.1.4 Internal Standards Performance

Internal standards, which are compounds not found in environmental samples, will be spiked into samples, blanks, MS/MSDs and laboratory control samples (LCSs) at the time of sample preparation. Internal standards must meet retention time and performance criteria specified in the analytical method or the sample will be reanalyzed.

12.1.5 Surrogate Recovery

Accuracy and matrix biases for individual samples are monitored for organic analyses using surrogate additions. Surrogates are compounds similar in nature to the target analytes; the surrogates are spiked into environmental samples, blanks and QC samples prior to sample preparation for organic analyses. The evaluation of the results of these surrogate spikes is not necessarily straightforward. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the review of data based on specific sample results is frequently subjective.

12.1.6 LCS

LCSs are standard solutions that consist of known concentrations of the complete list of target analytes spiked into laboratory analyte-free water or sand. They are prepared or

purchased from a certified manufacturer from a source independent from the calibration standards to provide an independent verification of the calibration procedure. These QC samples are then prepared and analyzed following the same procedures employed for environmental sample analysis to assess method accuracy independently of sample matrix effects. The laboratory will prepare and analyze an LCS with each group of a minimum of 20 samples of similar matrix that are extracted, digested or analyzed at the same time. For VOC analysis, one LCS will be analyzed with each analytical sequence in a 12-hour period for each matrix. Percent recoveries will be evaluated to assess the efficiency of the preparation and analysis method independent of sample matrix effects.

12.1.7 MS/MSD and Laboratory Duplicate Samples

MS/MSD and laboratory duplicate analyses will be performed on environmental samples at a frequency of one per sample matrix and every 20 samples of similar matrix. Whenever possible, MS/MSD and laboratory duplicate samples will be prepared and analyzed within the same batch as the environmental samples. MS/MSD samples will be spiked at the laboratory with the complete list of target analytes. MS/MSD and laboratory duplicate data are generated to determine long-term precision and accuracy of the analytical method with respect to sample matrices. Generally, the MS/MSD data alone are not used to evaluate the precision and accuracy for associated organic samples since data may reflect specific matrix effects only present within one sample.

12.1.8 Compound Identification and Quantitation

The objective of the qualitative criteria is to minimize the number of erroneous identifications of compounds. An erroneous identification can either be a false positive (reporting a compound present when it is not) or a false negative (not reporting a compound that is present). The identification criteria can be applied much more easily in detecting false positives than false negatives. Negatives, or non-detect compounds, represent an absence of data and are therefore much more difficult to assess. The objective for quantitative requirements is to maximize the accuracy of data and sensitivity of the

instrument. Unless sample screening indicates the presence of high concentration target analytes, samples will be analyzed undiluted to maximize sensitivity. Samples must be reanalyzed at the appropriate dilution when concentrations exceed the linear calibration range to maximize accuracy. Matrix interferences will be identified and documented. Samples may be diluted only if analytes of concern generate responses in excess of the linear range of the instrument.

12.2 Field QA/QC Checks

QA/QC samples will be collected to evaluate data quality. Attachment 1 lists the environmental and corresponding QC samples to be collected by analysis and matrix type.

12.2.1 Field Duplicate Samples

Collection of field duplicate samples provides for the evaluation of the laboratory's precision performance by comparing analytical results of two samples from the same location. They are also collected to evaluate field sample collection precision procedures. Samples are collected from one location and sent to the laboratory blind (with two different sample identifications). Duplicates of aqueous samples are obtained by alternately filling samples containers from the same sampling device for each parameter. Duplicates of aqueous samples submitted for VOC analysis from monitoring wells are filled from the same bailer full of water whenever possible and are the first set of containers filled. Duplicates of solid samples submitted for VOC analysis are obtained from discrete locations without mixing. Duplicates for the remaining analyses require homogenization by filling a decontaminated stainless steel tray or bowl with the sample and mixing it with a decontaminated stainless steel instrument. The mixed sample is divided in half and scooped alternatively from each half to fill the sample container. One field duplicate sample will be collected for every 20 environmental samples (minimum frequency of 5%) or one per matrix for less than 20 samples. If less than 20 samples are collected, one field duplicate sample will be collected.

12.2.2 MS/MSD and Duplicate Samples

MS/MSD samples are duplicate samples that have spiking solutions added at the laboratory during sample preparation. MS/MSD samples are considered identical to the original sample. The percent recovery of the spiked amount indicates the accuracy of the extraction as well as interferences caused by the matrix. Relative percent differences (RPD) between spike sample recoveries will indicate the precision of the data. Duplicates of aqueous samples are obtained by alternately filling samples containers from the same sampling device for each parameter. One MS/MSD sample set will be collected for every 20 environmental samples submitted to the laboratory (minimum frequency of 5%) or one MS/MSD for less than 20 samples.

For inorganic analyses, duplicate analyses will be performed on environmental samples at a frequency of one per sample matrix and every 20 samples of similar matrix. Duplicate samples will be prepared and analyzed within the same batch as the environmental samples. Duplicate data are generated to determine precision of the analytical method with respect to sample matrices.

12.2.3 Field Blanks

Field blanks will consist of samples of analyte-free water that are passed through and/or over decontaminated sampling equipment. One field blank will be collected per set of sampling equipment per sampling event. Field blanks will not be required if dedicated sampling equipment is utilized. The field blank samples will be subject to the same analyses as the environmental samples. One field blank will be collected per 10 samples or once per day, whichever is more conservative.

12.2.4 Trip Blanks

Trip blanks will be prepared as the other preservation containers and will contain analyte-free solvent. The trip blank will undergo shipment from the sampling site to the laboratory

in coolers with the environmental samples to be analyzed for VOCs. Trip blanks will be analyzed for VOCs to determine if contamination has taken place during sample handling and/or shipment. Trip blanks will be utilized for samples at a frequency of one each per shipment sent to the laboratory for VOCs.

12.2.5 Temperature Blanks

Temperature blanks will consist of vials of water that have undergone shipment from the sampling site to the laboratory in coolers with the environmental samples to be analyzed for the sampling program. The temperature of these blanks will be measured at the laboratory upon receipt of the sample cooler to verify compliance with the cooler temperature requirement.

12.3 Corrective Action

Generally, the following corrective actions will be taken by the laboratory. When parameters within control of the laboratory are not met, including calibration, instrument performance and blank criteria, the cause of the problem will be located and corrected. The analytical system will then be recalibrated. Sample analysis will not begin until calibration, instrument performance and blank criteria are met. The QA Officer will be notified of situations of repeated calibration, instrument performance or blank criteria failure at the time of sample analysis. When matrix spike, reference standard or duplicate analyses are out of control, samples analysis will cease and the problem will be investigated. Depending on the results of the overall QC program for the sample set, the data may be accepted, accepted with qualification or determined to be unusable. If the data is determined to be unusable, through the application of the corrective actions listed in Attachments 2 and 3, the QC analysis will be re-prepared and reanalyzed. If QC criteria are met upon reanalysis, only the new results are reported. If QC criteria are still not met upon reanalysis, both sets of sample results will be reported and the QA Officer will be notified of the situation at the time of sample analysis.

If matrix interferences are suspected, the QA Officer will be contacted. Unless sample screening indicates the presence of high concentration target analytes, samples may be diluted in the analysis only if analytes of concern generate responses in excess of the linear range of the instrument.

In the case of matrix interference, the laboratory will perform sample cleanup as provided by the methods. Interferences will be identified and documented. When matrix interferences are present, samples will be cleaned up during the extraction processes from appropriate methods. The cleanup, extraction and sample preparation methods will be listed in the data package case narrative. If the laboratory has taken appropriate actions and matrix interferences prevent the laboratory from achieving the specified QLs, the QA Officer will be contacted as soon as the situation is identified. The Laboratory Project Manager will document, in the data package case narrative, how the laboratory demonstrated good analytical practices in order to attempt to achieve the specified QLs.

The QC requirements and corrective actions listed in Attachments 2 and 3, which augment the method requirements, are to be followed by the laboratory in identifying QA/QC issues.

The laboratory will make every reasonable effort to correct QC excursions.

If problems arise with procedures or guidelines set forth herein, the Plumley Engineering QA Officer and Project Manager, in conjunction with the appropriate agencies, will formulate an appropriate corrective action.

12.4 Control Limits

Control limits are either listed in the appropriate methods or are established separately for respective matrix types for surrogate, LCS, MS/MSD and duplicate analyses. Control limits can be considered action limits. The laboratory-established limits are defined as ±3 standard deviations of the mean and correspond to 99.7% confidence limits of a normal distribution curve. Unless previously established, the laboratory will establish control limits for each analyte of concern using a minimum of 20 data points. The control limits are updated by the laboratory on an annual basis. Therefore, the most recent control limits will be used to evaluate data.

12.5 Field Sampling QA/QC

Field sampling crews will always be under direct supervision of the Field Leader. Bound logbooks and appropriate data sheets will be used to document the collection of samples and data so an

individual sample or data set can be traced back to its point of origin, sampler and type of sampling equipment.

Sampling will be performed according to the methods provided in the Work Plan and this QAPP. Field QA/QC samples include blind field duplicate, MS/MSDs, field blanks and trip blanks, and will be collected by the sampling team. These samples will be sent to the laboratory for analysis in conjunction with the environmental samples.

Field sampling precision will be evaluated through the RPD of the matrix spike and blind field duplicate sample analysis results. Control limits for the blind field duplicate precision have been established at ±50% for aqueous samples and ±100% for solid samples. For sample results that are less than or equal to five times the QL, the criterion of ±2 times the QL will be applied to evaluate field precision.

Decontamination of sampling equipment will be verified through the analysis of field blanks.

The presence of matrix interferences will be evaluated by the analysis of spiked MS/MSD samples.

The integrity of environmental media submitted for VOC analysis will be evaluated by the analysis of trip blanks that accompany each shipment of environmental samples to the laboratory. The trip blank results will be used to determine if contamination of the samples occurred during shipment and/or storage.

Proper chain of custody protocols, as presented in Section 10 of this QAPP, will be followed.

12.6 Data Assessment Procedures

The procedures employed by the laboratory to assess the quality of data generated in the laboratory include, but are not limited to, the following:

- Determination of analytical precision per method.

- Determination of analytical accuracy per method.

- Determination of analytical completeness.

- Determination of MDLs and QLs.

Data quality reviews by analysts, supervisors, managers, laboratory directors and QA personnel contribute to the total process.

Precision and accuracy may be assessed utilizing control charts. Control charts will consist of line graphs that provide a continuous graphic representation of the state of each analytical procedure. The standard deviation of the mean of the QC measurement is calculated and the upper and lower warning limits are set at ±2 standard deviation units. The upper and lower control limits are set at plus or minus three standard deviation units. Acceptable data are realized when results fall between the lower and upper warning limits. If the QC value falls between the control limit and the warning limit, the analysis should be scrutinized as possibly out of control.

In general, the accuracy of the methods will be determined by spiking the sample matrix with the analyte and by analyzing reference materials with known concentrations. The spiking levels will be selected to reflect the concentration range of interest. Percent recoveries of the spikes and reference materials will be calculated and compared to the established limits.

The precision of the methods will be determined by the analysis of matrix spike, laboratory duplicate and field duplicate samples. The precision will be evaluated by calculating the RPD for the duplicates. RPD calculations will be compared to the established limits.

The definitions and equations used for the assessment of data quality are discussed below.

- *Accuracy* – Accuracy is a measure of the nearness of an analytical result, or a set of results, to the true value. It is usually expressed in terms of error, bias or percent recovery (%R).

  The term accuracy is normally used synonymously with percent recovery. It describes either the recovery of a synthetic standard of known value or the recovery of a known

amount of analyte (spike) added to a sample of known value. The %R or accuracy can be calculated by using:

%R = (observed value/true value) x 100 *(for standards)*

%R = ((conc. spike + sample conc.) - sample conc. x 100)/conc. spike *(for spikes)*

- *Precision* – Precision refers to the agreement or reproducibility of a set of duplicate results among themselves without the assumption of any prior information as to the true result. It is usually expressed in terms of the percent difference (%D) or RPD. The %D is calculated by using:

  %D = (larger SR - smaller SR x 100)/smaller SR

  where SR = sample result

  The RPD is calculated by using:

  RPD = (|OSR - DSR| x 100)/((OSR + DSR)/2)

  where OSR = original sample result
  DSR = duplicate sample result

- *Average* – The average or arithmetic mean (X) of a set of n values (Xi) is calculated by summing the individual values and dividing by n:

  $X = (\sum Xi_{I=1 \text{ to } n})/n$

- *Range* – The range (R_i) is the difference between the highest and lowest value in a group. For n sets of duplicate values (X_2, X_1), the range (R_i) of the duplicates and the average range (R) of the n sets are calculated by the following:

$R_i = X_2 - X_1$

$R = \sum Ri_{i=1 \text{ to } n}/n$

- *Standard Deviation and Variation* – The standard deviation (S) of a sample of n results is the most widely used measure to describe the variability of a data set. It is calculated by using the following equation:

$$S = \sqrt{\frac{\Sigma (Xi - \overline{X})^2}{n-1}} \; n_{\text{ to } i-1}$$

where X = average of the n results
Xi = value of result

Normally, X ± S will include 68% and X ± 2S will include approximately 95% of normally distributed data.

The variance is equal to S2. The percent relative standard deviation (%RSD) or coefficient of variation (CV) is the standard deviation divided by the mean and multiplied by 100 as follows:

CV = 100S/X

The Laboratory Project Manager, with individual laboratory group leaders, will identify any data that should be rated as "unacceptable," based on the assessment of the QA/QC criteria and will notify the Plumley Engineering Project Manager.

13.0 INSTRUMENT/EQUIPMENT TESTING AND MAINTENANCE

Preventative maintenance procedures will be carried out on field equipment by Plumley Engineering personnel in accordance with the procedures outlined in the manufacturers' specifications and/or equipment manuals.

Maintenance activities involving field equipment will be recorded in the field notes. Field equipment will be check by qualified field representatives prior to being used in the field. Problems encountered while operating the instrument will be documented in the field notes. If problem equipment is detected or should require service, the equipment will be returned and a qualified technician will perform the maintenance required. Use of the instrument will not be resumed until the problem is resolved.

Each major piece of analytical laboratory instrumentation that will be used on this project has been documented and is on file with the laboratory. An equipment form will be prepared for each new purchase and old forms will be removed from the instrument area and filed when an instrument is replaced.

The laboratory will be required to maintain an equipment form detailing both preventative maintenance activities and the required QA testing and monitoring. In the event the instrument does not perform within the limits specified on the monitoring form, the Laboratory Project Manager will be notified and a decision will be made as to what corrective action is necessary. The corrective action procedure will be documented in the instrument log. If repair is necessary, the instrument will not be used for analyses until repairs are completed and the instrument tested. Repairs made to the instrument will be documented in the instrument logbook. Required QA/QC testing and monitoring will be completed prior to the resumption of sample analysis.

Routine maintenance is performed to keep laboratory instruments running under optimum conditions and to reduce instrument malfunction. Specific preventative maintenance programs outlining required maintenance procedures and their application frequencies are incorporated in laboratory SOPs for each methodology.

Minimally, field and laboratory instruments will undergo maintenance on an annual basis and when calibration, blank or QC analyses indicate maintenance is necessary to correct or improve system performance. Maintenance, whether performed by laboratory personnel or manufacturer, is documented as an entry in the appropriate log. Log entries include the reason for maintenance, maintenance performed, date and initials of person in charge during maintenance.

The operating temperatures for refrigerators, coolers, ovens and water baths will be monitored daily by the laboratory. The analyst will record the following information in a bound logbook: equipment identification, temperature reading, date and time of reading, and analyst initials.

14.0 CALIBRATION AND FREQUENCY

14.1 Field Equipment Calibration

Field equipment used when implementing the SMP will be calibrated in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications. Equipment to be used for the field sampling will be examined to confirm that it is in good operating condition. This includes checking the manufacturer's operating manual and the instructions for each instrument to confirm that the maintenance requirements are being observed.

In general, instruments will be calibrated daily prior to use and will be recalibrated as required. All calibration procedures performed will be documented in the field logbook. Calibration will be performed at the intervals specified by the manufacturer. In the event an internally calibrated field instrument fails to meet calibration procedures, it will be returned to the manufacturer for service.

14.2 Laboratory Equipment Calibration

Proper calibration of laboratory analytical instrumentation is essential for the generation of reliable data that meets the project DQOs. Analytical instrument calibration is monitored through the use of control limits established for individual analytical methods. Calibration procedures to be followed are specified, in detail, in the analytical methods. These procedures specify the type of calibration, calibration materials to be used, range of calibration and frequency of calibration. The calibration requirements listed in the QC requirements and corrective actions in Attachments 2 and 3, which augment the method requirements, are to be followed by the laboratory.

The laboratory will be responsible for proper calibration and maintenance of laboratory analytical equipment. The following subsections present general calibration procedures outlined in the analytical methods. For additional calibration information, refer to Attachments 2 and 3.

14.2.1 GC/MS

Before the GC/MS is calibrated for organics analysis, the mass calibration and resolutions of the instruments are verified for VOCs by 4-bromofluorobenzene (BFB) and for SVOCs by decafluorotriphenylphosphine (DFTPP). The performance check analysis must meet the criteria referenced in the analytical method and the QAPP. The system must be verified every 12 hours of analysis and when the instrument performance check solution fails to meet criteria. Samples are not analyzed until performance check analysis criteria are met.

For organics analysis, an initial five-point calibration is performed for the target compounds prior to start-up and whenever system specifications change or if the continuing calibration acceptance criteria have not been met. The lowest calibration standard establishes the QL concentration. The method criteria, including relative response factors (RRFs) and %RSD of specific compounds, must meet established criteria as specified in the method and the QAPP. If these parameters fail to meet criteria, corrective actions must be implemented and the initial calibration must be repeated.

14.2.2 Inorganics

Instrument calibration for metal analyses is performed daily. A two-point calibration for ICP analyses is performed. Five-point calibrations are performed for cold vapor atomic absorption instruments. For non-ICP analyses, the lowest calibration standard establishes the QL concentration. The calibration curves must have correlation coefficients greater than or equal to 0.995. Calibration verification is monitored by analyzing a calibration verification standard, and a calibration blank following calibration, every 10 samples, and at the end of the analytical sequence. The calibration verification standard recovery must be within appropriate method and QAPP criteria or the instrument must be recalibrated. The calibration blank must not contain target compounds at concentrations greater than the QL or corrective actions are implemented.

To verify inter-element and background corrective factors for ICP analysis, interference check samples (ICSA and ICSAB) must be analyzed at the beginning and end of the

analysis sequence or a minimum of twice per 8 hours. The percent recoveries for ICS solutions must be within 80% to 120% or corrective actions must be implemented. In addition, for ICP analyses, a serial dilution analysis must be performed per sample matrix. If the analyte concentration is greater than 10 times the IDL in the original sample, a serial dilution (5-fold dilution) must agree within 10% of the original determination. Detection limits, inter-element corrective factors and linear ranges must be established at the frequency specified in the method.

14.2.3 Thermometers

Thermometers are calibrated on an annual basis using a certified thermometer with a traceable calibration certificate. General purpose thermometers are calibrated at three temperatures encompassing the entire operating range of the thermometer and labeled with correction factors. Thermometers are calibrated at room temperature, at ice point, at the boiling point or above the boiling point. The maximum allowable deviation from the certified thermometer is 2°C. Any thermometer exceeding this tolerance is to be discarded.

14.3 Standards and Solutions

The use of standard materials of a known purity and quality is necessary for the generation of reproducible data. The laboratory will monitor the use of laboratory materials including solutions, standards and reagents. Reagent solutions used for quantitation purposes must be American Chemical Society (ACS)-grade or better. Standards prepared or purchased must be traceable to National Standards of Measurement. Standards should be traceable by lot number to a certificate of analysis, which is on file at the laboratory. Standards and standard solutions are verified prior to use. This verification may be in the form of a certification of analysis from the supplier or by comparison to a standard curve or another standard from a separate source. Standards are routinely checked for signs of deterioration, including unusual volume changes, discoloration, formation of precipitates or changes in analyte response.

Solvent materials are also verified prior to use. Each new lot of solvent is analyzed to verify the absence of interfering constituents. Reagent and method blanks are routinely analyzed to evaluate possible laboratory-based contamination of samples.

14.4 Records

A records book will be kept for standards and will include the following information:

- Material name.
- Control or lot number.
- Purity and/or concentration.
- Supplier/manufacturer.
- Receipt/preparation date.
- Recipient/preparer name.
- Expiration date.

These records will be checked periodically as part of the laboratory's internal laboratory controls review.

14.5 Calibration Records

Calibration data will be kept for each instrument that requires calibration. The data will contain a record of activities associated with QA monitoring and instrument repairs. These records will be checked during periodic equipment review and internal and external QA/QC audits.

15.0 INSPECTION REQUIREMENTS FOR SUPPLIES

The use of standard materials of a known purity and quality is necessary for the generation of reproducible data. The laboratory will monitor the use of laboratory consumable materials, including solutions, standards and reagents as described in Section 14.

Solvent materials are also verified prior to use. Each new lot of solvent is analyzed to verify the absence of interfering constituents. Reagent and method blanks are routinely analyzed to evaluate possible laboratory-based contamination of samples.

The sample containers used for this project will be supplied by the laboratory. The containers will be pre-cleaned sample containers purchased from a EPA-certified manufacturer (I-Chem 200 or equivalent container) or cleaned using EPA protocols.

16.0 DATA ACQUISITION REQUIREMENTS

Non-direct measurement data, in the form of historical data from previous site investigations, will be utilized.

17.0 DATA MANAGEMENT

Definitive data will be generated in the laboratory and screening data will be generated in the field as described in Section 5. The laboratory-generated data will be entered into the laboratory database management system and presented in data packages. The laboratory will perform the data review process described in Section 20.

Data will be managed in a relational database management system (DBMS). Laboratory analytical data will be provided in electronic disk deliverable format for direct upload into the DBMS. Associated field data will be entered into the DBMS by hand. The DBMS will then be used to provide custom queries and reports to support data analysis and report preparation. Final tables containing the validated sample data will be presented.

Records will be incorporated into the final project files. Field logs, data packages and records will be included in the Plumley Engineering project file that will be archived for a period of 10 years.

18.0 ASSESSMENT AND RESPONSE ACTIONS

18.1 Performance and System Audits

18.1.1 Performance Audits

At the discretion of the Plumley Engineering Project Manager, field and laboratory performance audits consisting of onsite performance evaluations will be performed once during the field program and during the laboratory analysis program. The audits will be performed by the QA Officer or designee. These audits will evaluate the adherence of the field and laboratory programs to the QA program outlined in this QAPP. The protocols used to conduct the audits may be found in the following sections. Acceptance criteria used in determining the need for corrective action will be those criteria defined in this QAPP. Where acceptance criteria are not defined for laboratory procedures and analytical methods, the laboratory's SOPs and QAM will be consulted. The results of the field and laboratory audits will be documented and submitted to the Project Manager. These reports and any corrective actions that are implemented as a result of the audits will be maintained on file.

18.1.2 Laboratory Audit Protocol

The laboratory audit will note factors that may affect the quality of the analytical results. Minimum QA/QC criteria specified in this QAPP and the analytical methods must be adhered to. An onsite evaluation will be performed by the QA Officer or designee. The areas of concern of the laboratory audit will include:

- Implementation of a scientifically sound QA/QC program addressing precision, accuracy, reproducibility, comparability, completeness and blank contamination.

- Sufficient documentation and recordkeeping for technical personnel external to the laboratory to recreate each analytical event.

- Compliance with the project requirements for laboratory analysis.

The specific parameters to be evaluated include:

- Data comparability.
- Calibration and quantitation.
- QC execution.
- Out-of-control events.
- SOPs.
- Sample management.
- Recordkeeping.
- Instrument calibration records.
- Other analytical records.
- QC records.
- Corrective action reports.
- Maintenance logs.
- Data review.
- MDLs and QLs.
- QC limits.
- Analytical methods.

18.1.3 Field Audit Protocol

The purpose of a field audit is to identify whether the systems and procedures described in the QAPP are operational in the field and contributing to the production of accurate and defensible analytical results. An onsite evaluation will be performed by the QA Officer or designee. The areas of concern in a field audit include:

- Sampling procedures.
- Decontamination of sampling equipment, if applicable.
- Chain of custody procedures.
- SOPs.
- Proper documentation of field methods.

18.2 System Audits

Routine laboratory and field performance will be monitored through the analysis of field/equipment and laboratory blanks, spiked samples, laboratory control samples, laboratory and field duplicates, and performance evaluation samples. The Laboratory Project Manager, in conjunction with the Plumley Engineering QA Officer and Project Manager, will formulate corrective actions in the event QC limits specified in this document are exceeded. The results of the system audits will be documented in the project report.

18.3 Corrective Actions

Corrective action procedures will be implemented based on unacceptable audit results or on detection of unacceptable data during data review performed by the laboratory and the Plumley Engineering Project Manager.

Two types of audits will be performed. The data generation process will be audited by assessing adherence to control limits and by performing an onsite laboratory audit, if requested by the Plumley Engineering Project Manager. The field program will be audited by assessing adherence to the procedures outlined in this document by the analysis of field QC samples and by performing an onsite field audit, if requested by the Project Manager. If required, corrective action procedures will be developed on a case-by-case basis. The enacted corrective actions will be documented in the appropriate notebook, log or case file. File and laboratory personnel are encouraged to discuss specific issues and proposed corrective actions with the QA Officer.

The Field Leader will be responsible for field QA. Field sampling excursions discovered during field sampling will be documented in the field logbook and immediate corrective action will be taken. For problems or situations that cannot be solved through immediate corrective action, the Field Leader will immediately notify the Project Manager, who will investigate the situation and determine who will be responsible for implementing the corrective action. Corrective action will be implemented upon approval by the Project Manager. The Project Manager will verify that the corrective action has been taken, appears effective and at a later date, verify the problem has been resolved. The successfully implemented corrective action will be documented in the field logbook by the Field Leader. Deviations from the QA protocol in this QAPP must be justified, approved by the Project Manager and properly documented.

The corrective actions that will be taken by the laboratory were described previously in Section 12.3 of this QAPP.

19.0 QA REPORTS TO MANAGEMENT

Following completion of the annual sampling, Plumley Engineering will prepare a letter report documenting the field activities and the analytical results. Conclusions and recommendations will be based on evaluation and interpretation of data. The annual report will present a discussion of whether any additional engineering and/or institutional controls are appropriate and necessary.

20.0 DATA REVIEW AND MANAGEMENT

20.1 Deliverables

For data to be scientifically valid, legally defensible and comparable, valid procedures must be used to prepare this data. The data results will be reported to Plumley Engineering in CLP-like deliverables format. The laboratory will be responsible for providing the correct type of data package to Plumley Engineering. The laboratory will also provide the complete data packages in electronic format.

20.2 Data Production, Handling and Reporting

20.2.1 Underlying Documents

Specific laboratory procedures and instrumentation can be found in the SOPs and QAM for the laboratory. The data production and reporting procedures described below will be employed at the laboratory.

20.2.2 Data Reduction

Data reduction consists of manual and computer data reduction procedures and calculations. Computer data reduction procedures and calculations will be checked manually by the laboratory to verify that compound identification and quantitation adhere to method requirements. The laboratory will be responsible for maintaining a listing of computer-based data reduction programs and SOPs for data reduction. Sample preparation or extraction logs will be used to document sample preparation information (preparation weights, volumes, reagents). Instrument injection logs or bench sheets will also be maintained for each instrument.

Qualitative identification and quantitation of organic and inorganic analytes will be performed by experienced analysts in accordance with analytical method requirements.

20.2.3 Laboratory Data Review

Analytical results are generally entered into the laboratory computer system by the analyst, independently reviewed by another analyst or supervisor experienced in the method, and approved by the Laboratory Project Manager. The following are requirements that are generally examined as part of this review:

- Initial calibration criteria were met. Standards in the calibration curve covered the expected concentration ranges of the samples, including the QL.
- Initial and continuing calibrations met the acceptance criteria defined in the method standard procedure.
- Sample results fell within the range of the standard curve.
- For GC/MS methods requiring internal standards, retention times and area responses were evaluated against limits established by the daily calibration.
- Method blanks were processed with each analytical batch and no detectable levels of contamination were identified.
- MS/MSDs were performed at the required frequency and recoveries were within acceptable control limits.
- Duplicate analyses were performed at the required frequency and results were within the control limits.
- LCS analyses were performed with each analytical batch and the results obtained were within control limits.
- For organic compound analyses, surrogate spike recoveries were within control limits.

- Compounds identified by GC/MS were manually rechecked by comparison with the data system library for both target compounds and tentatively identified compounds. Retention times and ratios of fragmentation were verified.

- Calculations have been accurately performed.

- Reporting units are correct.

- Data for the analysis provide a complete audit trail.

- QLs comply with data quality requirements.

The analyst's supervisor will check a minimum of 10% of the data back to raw data in the secondary review. A data package will be generated when required analyses on the samples in a project are complete, entered and reviewed. The data package will be forwarded to the assigned Laboratory Project Supervisor or designee for review. The data package will then be reviewed for the following items (at a minimum):

- QC data will be reviewed to identify whether or not internal specification and contract requirements have been met.

- Non-conformance reports, if any, will be reviewed for completion of corrective actions and their impact of results. QC requirements and corrective actions listed in Attachments 2 and 3 of this QAPP will be referenced in the laboratory review process. Non-compliance and corrective action procedures will be documented in the case narrative.

The data package requires the signature of the Laboratory Project Supervisor or designee. Electronic data are copied onto computer tape, inventoried and stored offsite in a secure facility or within locked cabinets onsite. This data archive system is maintained for a minimum of five years.

Following final review, two copies of the data package will be transmitted to Plumley Engineering.

The full deliverable data packages will document sample preparation, extraction and analysis, and include raw data and logs associated with the analyses.

All data deliverables from each laboratory must be paginated in ascending order. The data packages will be provided within four weeks of receipt of the last sample at the laboratory for each sampling event.

20.2.4 Data Management

Data will be managed in a relational DBMS. Laboratory analytical data will be provided in electronic data deliverable format for direct upload into the DBMS. Associated field data will be entered into the DBMS by hand. The DBMS will then be used to provide custom queries and reports to support data analysis and report preparation.

21.0 RECONCILIATION WITH USER REQUIREMENTS

Sample results from this monitoring will be reviewed by the Plumley Engineering Project Manager. Data will be compared to the project screening criteria. Data usability with respect to the DQOs and data uses will be compared to the project requirements. The parameters that will be used to assess the precision, accuracy, representativeness, comparability and completeness are presented in Section 5 of this QAPP. In the event the completeness objective of 95% is not achieved due to major QC deviations in the sample analysis process, samples will be recollected at the discretion of the Project Manager.

ATTACHMENT 1

FIELD SAMPLING
SUMMARY OF ANALYSES

ATTACHMENT 1

FIELD SAMPLING SUMMARY OF ANALYSES

Parameter	Matrix	Sample Containers and Volumes	Preservation	Holding Time	Number of Investigative Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSDS and Spike Duplicate**	Field Blank***
VOCs (USEPA Methods 5030B/ 8000C/8260B)[1]	Aqueous	Three 40-milliliter glass vials with Teflon® lined septum caps	4°C HCL to pH≤2 FC	Analysis within 14 days from collection for analysis for preserved samples	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per day as required
SVOCs (USEPA Methods 3510C/ 3520C/8000C/8270C)[1]	Aqueous	One 1-liter amber glass container with Teflon® lined screw caps	4°C	7 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per day as required

NOTES:

* Indicates that USEPA Method 5030A, involving utilizing bulk sample vials for preparation, will not be performed for solid samples submitted for VOC analysis.

** MS/MSD indicates matrix spike/matrix spike duplicate sample for organic analyses. Spike duplicate is performed for inorganic analyses.

*** Field blank is required at a frequency of one per 10 samples or one per day if less than 10 samples are collected for each matrix type. Field blank is not required if disposable equipment is used.

FC indicates that if free chlorine is present in samples, it must be removed by the appropriate addition of $Na_2S_2O_3$ or ascorbic acid.

VOCs indicates volatile organic compounds.

SVOCs indicates semi-volatile organic compounds.

United States Environmental Protection Agency (USEPA). 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846,* 3rd Edition, Update IIIB. Washington D.C.

TBD indicates that the number of environmental samples to be determined at a later date.

ATTACHMENT 2

VOLATILE ORGANIC COMPOUNDS USING EPA METHOD 8260 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

ATTACHMENT 2

VOLATILE ORGANIC COMPOUNDS USING EPA METHOD 8260
QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Holding times	Samples must be analyzed within holding time.	Analyze within 14 days from collection for preserved aqueous and solids. Analyze within 7 days from collection for unpreserved aqueous.	1. If holding times are exceeded for initial or any re-analyses required due to QC excursions. 2. Notify QA Officer since re-sampling may be required. 3. Document corrective action in the case narrative.
Solid Sample Collection	Samples must be prepared using USEPA Method 5035	NA	NA
GC/MS Instrument Performance Check	Once every 12 hours prior to initial calibration and calibration verifications. Analytical sequence must be completed within 12 hours of the GC/MS Instrument Performance Check	1. Bromofluorobenzene (BFB) key ions and abundance criteria listed in the method must be met for all 9 ions and analyses must be performed within 12 hours of injection of the BFB. 2. Part of the BFB peak will not be background subtracted to meet tune criteria. 3. Documentation of all BFB analyses and evaluation must be included in the data packages.	1. Tune the mass spectrometer. 2. Document corrective action in the case narrative. 3. Samples cannot be analyzed until control limit criteria have been met.
Initial Calibration	Prior to sample analysis and when calibration verifications criteria are not met. Initial calibration will contain all target analytes in each standard. Quantitation of analyses will utilize the initial calibration results.	1. Five concentrations bracketing expected concentration range for all compounds of interest. 2. One second-source standard must be analyzed immediately following the initial calibration at the mid-calibration concentration. This standard must be within 30% recovery or within laboratory control limits. It is also recommended that a separate standard at the MDL level be analyzed after calibration is complete to check sensitivity. 3. Response factor (RF) as listed in Method 8260B, with remaining RFs factor $\geq$ 0.050 except for ketones with allowable response factor $\geq$ 0.010. 4. For compound with %RSD >15, quantitation must be performed using a separate calibration curve and the Coefficient of Determination (COD) must be $\geq$ 0.990.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document corrective action in the case narrative. 4. Samples should not be analyzed until calibration control limit criteria are met. 5. Contact QA Officer to discuss problem target analytes before proceeding with analysis.

Audit	Frequency	Control Limits	Corrective Action
Calibration Verification	Every 12 hours, following BFB. Calibration verification will contain all target analytes in each standard at a concentration that is representative of the midpoint of the initial calibration.	1. Within percent drift or percent difference (%D) of ≤20 for all compounds. RF requirements are the same as listed in the initial calibration. 2. The internal standards areas and retention times must meet the method criteria.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document corrective action in the case narrative; samples should not be analyzed until calibration control limit criteria are met.
Preparation Blank Analysis	Every 12 hours, following calibration verification	Methylene chloride less than 3 times QL, 2-butanone and acetone less than 5 times QL. Remaining analytes less than QL. QLs and MDLs will be provided along with the preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system, and reanalyze all samples if detected for same compounds as in blank. 3. Document corrective action in the case narrative - samples cannot be analyzed until blank criteria have been met.
Field/Equipment Blank Analysis	Collected one per sampling event, or one per 20 samples or one per matrix (for less than 20 samples)	Methylene chloride less than 3 times QL, 2-butanone and acetone less than 5 times QL. Remaining analytes less than QL. QLs and MDLs will be provided along with the preparation blank results.	Investigate problem. Document in the case narrative.
Trip Blank	1 per cooler containing VOC samples.	Methylene chloride less than 3 times QL, 2-butanone and acetone less than 5 times QL. Remaining analytes less than QL. QLs and MDLs will be provided along with the preparation blank results.	Investigate problem. Document in the case narrative.
Laboratory Control Sample Analysis	Each analytical batch (every 12 hours). Prepared independently from calibration standards. Spike must contain all target analytes and should be at a concentration, which is in the lower 1/2 of the calibration curve.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these compounds are not detected in the associated samples, corrective action is not required. 2. If recovery failures are below control limits, reanalyze LCS and examine results of other QC analyses. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document corrective action in the case narrative.
Internal Standards	All samples and blanks (including MS/MSD)	Response -50% - +200% of internal standards from continuing calibration of the day. RT must be ± 30 sec. from associated calibration verification standard of that sequence.	Reanalyze. If still outside of the limits, report both analyses. Document corrective action in the case narrative.

Audit	Frequency	Control Limits	Corrective Action
Surrogate Spike	All samples and blanks (including MS/MSD)	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze any environmental or QC sample with surrogates that exceed control limits. 2. If still outside of the limits, report both analyses. 3. Document corrective action in the case narrative.
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis	Collected one per 20 samples or one per matrix (for less than 20 samples) Samples from the investigation must be used for MS/MSD analysis. Spike must contain complete list of target analytes.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is still <10%, report both analyses and document in the case narrative. 3. If >10% and LCS criteria are met, document in case narrative; no additional corrective action required. 4. If LCS criteria are exceeded also, examine other QC data for source of problem; *i.e.,* surrogate recoveries for extraction efficiency and calibration data for instrument performance issues. 5. Reanalyze samples and associated MS/MSD and LCSs as required. 6. Document corrective action in the case narrative
Field Dup. Analysis	Collected one per 20 samples or one per matrix (for less than 20 samples) Field duplicate will not be identified to the laboratory.	Validation criteria: 50% RPD for waters, 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

Audit	Frequency	Control Limits	Corrective Action
Target Analyte Identification	As required for identification of target analytes	1. The intensities of the characteristic ions of a compound maximize in the same scan or within one scan of each other. Selection of a peak by a data system target compound search routine where the search is based on the presence of a target chromatographic peak containing ions specific for the target compound at a compound-specific retention time will be accepted as meeting this criterion. 2. The relative retention time (RRT) of the sample component is within ± 0.06 RRT units of the RRT of the standard component. 3. The relative intensities of the characteristic ions agree within 30% of the relative intensities of these ions in the reference spectrum. (Example: For an ion with an abundance of 50% in the reference spectrum, the corresponding abundance in a sample spectrum can range between 20% and 80%.) 4. Structural isomers that produce very similar mass spectra should be identified as individual isomers if they have sufficiently different GC retention times 5. Identification is hampered when sample components are not resolved chromate-graphically and produce mass spectra containing ions contributed by more than one analyte. When gas chromatographic peaks obviously represent more than one sample component (i.e., a broadened peak with shoulder(s) or a valley between two or more maxima), appropriate selection of analyte spectra and background spectra is important.	Not applicable
Target Analyte Identification	As required for identification of target analytes	Examination of extracted ion current profiles of appropriate ions can aid in the selection of spectra, and in qualitative identification of compounds. When analytes co-elute (i.e., only one chromatographic peak is apparent), the identification criteria may be met, but each analyte spectrum will contain extraneous ions contributed by the coeluting compound.	Not applicable

Audit	Frequency	Control Limits	Corrective Action
Target Analyte Quantitation	Apply USEPA Method 8000C for medium level extraction technique	Moisture correction in accordance with USEPA Method 8000C will be applied to the complete set of solid samples, regardless of the percent moisture content.	Not applicable
Tentatively Identified Compound	If required, perform for each sample and blank analysis. Non-target compounds will be reported using a Mass Spectral Library search.	Not applicable	Not applicable
Dilutions	1. When target analyte concentration exceeds upper limit of calibration curve. 2. When matrix interference is demonstrated by the lab and documented in the case narrative (highly viscous samples or a large number of nontarget peaks on the chromatogram). 3. It is recommended that a reagent blank be analyzed if an analyte saturates the detector or if highly concentrated analytes are detected. Otherwise data impacted from carryover cannot be used. 4. Laboratory will note in the data deliverables which analytical runs were reported.	1. The reagent blank will meet the method blank criteria.	1. Reanalyze reagent blank until method blank criteria are met. 2. Document corrective action in the case narrative.
Percent solids	For soil samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable
pH Determination	Once sample aliquot is taken from the VOC vial, the pH of water samples must be determined.	Record pH and report in the case narrative.	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable

Audit	Frequency	Control Limits	Corrective Action
Deliverables	1. CLP-like deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures and any observations of bubbles in sample containers will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:

Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.

Communications with Plumley Engineering will be documented and included in the data packages.

ATTACHMENT 3

SEMI-VOLATILE ORGANIC COMPOUNDS USING EPA METHOD 8270 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

ATTACHMENT 3

SEMI-VOLATILE ORGANIC COMPOUNDS USING EPA METHOD 8270
QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Holding Times	Samples must be extracted and analyzed within holding time.	Extract within 7 days from collection for aqueous samples; 14 days for soil samples. Analyze extracts within 40 days of extraction.	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QA Officer since re-sampling may be required.
GC/MS Instrument Performance Check	Once every 12 hours prior to initial calibration and calibration verification. Must contain 50ng/µL of 4,4-DDT, pentachlorophenol, and benzidine. Analytical sequence must be completed within 12 hours of the GC/MS Instrument Performance Check	1. Decafluorotriphenylphosphine (DFTPP) key ions and abundance criteria listed in the method must be met for all 13 ions and analyses must be performed within 12 hours of injection of the DFTPP. 2. Part of the DFTPP peak will not be background subtracted to meet tune criteria. 3. Documentation of all DFTPP analyses and evaluations must be included in the data packages. 4. Degradation of 4,4-DDT <20%. Peak tailing must not be evident.	1. Tune the mass spectrometer. 2. Document corrective action in the case narrative - samples cannot be analyzed until control limit criteria have been met.
Initial Calibration	Prior to sample analysis and when calibration verification criteria are not met. Initial calibration will contain all target analytes in each standard. Quantitation of analyses will utilize the initial calibration results.	1. Five concentrations bracketing expected concentration range for all compounds of interest. 2. One second-source standard must be analyzed immediately following the initial calibration at the mid-calibration concentration. This standard must be within 30% recovery or within laboratory control limits. It is also recommended that a separate standard at the MDL level be analyzed after calibration is complete to check sensitivity. 3. Response factors must meet criteria listed in Method 8270C with the remaining RFs 0.05 with allowable response factor for n-nitroso-di-n-propylamine and 2,4-dimethylphenol of 0.01. 4. For compounds with %RSD >15, quantification must be performed using a separate calibration curve and the COD must be ≥ 0.990.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria are met.

Audit	Frequency	Control Limits	Corrective Action
Calibration Verification	Every 12 hours, following DFTPP. Calibration verification will contain all target analytes in each standard at a concentration that is representative of the midpoint of the initial calibration.	1. Within method specified criteria, percent drift or percent difference (%D) ≤ 20 for all compounds. Response factor requirements as listed in initial calibration. 2. The internal standards areas and retention times must meet the method criteria.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria are met.
Preparation Blank Analysis	Prepared with each extraction batch of no more than 20 analytical samples.	1. Common laboratory contaminants (phthalate) less than 5 x QL. Remaining analytes less than QL. 2. QLs and MDLS will be provided along with the preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system and re-extract and reanalyze all samples if detected for same compounds as in the blank. 3. Document corrective action in the case narrative - samples should not be analyzed until blank criteria have been met.
Field/Equipment Blank Analysis	Collected one per sampling event, or one per 20 samples or one per matrix (for less than 20 samples)	1. Common laboratory contaminants (phthalate) less than 5 x QL. Remaining analytes less than QL. 2. QLs and MDLS will be provided along with the blank results.	1. Investigate problem. 2. Document in the case narrative.
Laboratory Control Sample Analysis	Prepared with each extraction batch, of no more than 20 analytical samples. Prepared independently from calibration standards. Spike must contain all target compounds and should be at a concentration that is approximately in the lower 1/2 of the calibration curve.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70 to 130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these compounds are not detected in the associated samples, no corrective action is required. 2. If recovery failures are below the control limits, reanalyze LCS and examine results of other QC analyses. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document corrective action in the case narrative.
Internal Standards	All samples and blanks (including MS/MSD).	1. Response -50% - +200% of the internal standards from the continuing cal of the day. 2. RT must be ± 30 sec. from calibration verification of that sequence.	1. Reanalyze. 2. If recovery is still outside criteria, report both analyses. 3. Document corrective action in the case narrative.

Audit	Frequency	Control Limits	Corrective Action
Surrogate Spike	All samples and blanks (including MS/MSD).	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if more than 1 AE or 1 BN fails, or if any one surrogate recovery is < 10%. 2. If recovery meets criteria, report both analyses. 3. If re-analysis recovery fails and if the recovery is <10%, re-extract sample if within holding time and re-analyze. 4. If re-analysis recovery fails and if the recovery is >10%, report both analyses. 5. Document corrective action in the case narrative.
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis	Collected one per 20 samples or one per matrix (for less than 20 samples) Samples from the investigation must be used for MS/MSD analysis. Spike must contain complete list of target analytes.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is < 10%, report both analyses and document in the case narrative. 3. If reanalysis is >10%, and LCS criteria are met, document in the case narrative. 4. If LCS criteria are exceeded also, examine other QC data for source of problem; i.e. surrogate recoveries for extraction efficiency and calibration data for instrument performance issues; re-extract or reanalyze samples and associated MS/MSD and LCSs as required.
Field Dup. Analysis	Collected one per 20 samples or one per matrix (for less than 20 samples). Field duplicate will not be identified to the laboratory.	Validation criteria: 50% RPD for waters, 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

Audit	Frequency	Control Limits	Corrective Action
Target Analyte Identification	As required for identification of target analytes	1. The intensities of the characteristic ions of a compound maximize in the same scan or within one scan of each other. Selection of a peak by a data system target compound search routine where the search is based on the presence of a target chromatographic peak containing ions specific for the target compound at a compound-specific retention time will be accepted as meeting this criterion. 2. The relative retention time (RRT) of the sample component is within ± 0.06 RRT units of the RRT of the standard component. 3. The relative intensities of the characteristic ions agree within 30% of the relative intensities of these ions in the reference spectrum. (Example: For an ion with an abundance of 50% in the reference spectrum, the corresponding abundance in a sample spectrum can range between 20% and 80%.) 4. Structural isomers that produce very similar mass spectra should be identified as individual isomers if they have sufficiently different GC retention times. 5. Identification is hampered when sample components are not resolved chromatographically and produce mass spectra containing ions contributed by more than one analyte. When gas chromatographic peaks obviously represent more than one sample component (i.e., a broadened peak with shoulder(s) or a valley between two or more maxima), appropriate selection of analyte spectra and background spectra is important. 6. Examination of extracted ion current profiles of appropriate ions can aid in the selection of spectra, and in qualitative identification of compounds. When analytes coelute (i.e., only one chromatographic peak is apparent), the identification criteria may be met, but each analyte spectrum will contain extraneous ions contributed by the coeluting compound.	Not applicable

Audit	Frequency	Control Limits	Corrective Action
Cleanup	Gel permeation chromatography should be performed for water should extracts with high molecular weight contaminants.	Calibrate according to method. Criteria must be met as listed in method for calibration and blank analysis.	Clean GPC column or replace.
Tentatively Identified Compounds	If required, for each sample and blank analysis. Non-target compounds will be reported using a Mass Spectral Library search.	Not applicable	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Percent solids	For soil/ samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable
Dilutions	1. When target analyte concentration exceed upper limit of calibration curve. 2. When matrix interference demonstrated by lab and documented in the case narrative (highly viscous samples or a large number of non-target peaks on the chromatogram). 3. Samples should be cleaned up during sample preparation/extraction procedure using appropriate methods when matrix interference is present. 4. Laboratory will note in the data deliverables which analytical runs were reported.	Not applicable	Not applicable
Laboratory Control Limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable

Audit	Frequency	Control Limits	Corrective Action
Deliverables	1. CLP-like deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QAPP Requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:

Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.

Communications with Plumley Engineering will be documented and included in the data packages.

APPENDIX H – HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

Focused Site Investigation
Former National Plating Co. Inc. Site
1501 Brewerton Road
Syracuse, New York

Approved by: _____ Date: _____
ENSR Regional Health and Safety Manager

Approved by: _____ Date: _____
ENSR Project Manager

CONTENTS

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1.0 INTRODUCTION

1.1 HASP Applicability

This site-specific Health and Safety Plan (HASP) has been developed by ENSR Corporation (ENSR). It establishes the health and safety procedures to minimize any potential risk to ENSR and contractor personnel implementing the focused site investigation at the Former National Plating Co. Inc. facility located in Syracuse, New York. ENSR is performing this work on behalf of Hancock & Estabrook.

The provisions of this plan apply to all ENSR personnel and ENSR subcontractor personnel who may potentially be exposed to safety and/or health hazards related to activities described in Section 3.0 of this document.

This HASP has been written to comply with the requirements of the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120). All activities covered by this HASP must be conducted in complete compliance with this HASP and with all applicable federal, state, and local health and safety regulations. Personnel covered by this HASP who cannot or will not comply will be excluded from site activities.

This plan will be distributed to each employee involved with the investigations being conducted at the former manufacturing facility. Each employee must sign a copy of the attached health and safety plan receipt and acceptance form (see Attachment A).

This HASP only pertains to the tasks that are listed in Section 3.0. A task specific HASP or addenda to this HASP will be developed at a later date for any other subsequent investigative/remedial activities at the facility.

1.2 Organization/Responsibilities

The implementation of health and safety at this project location will be the shared responsibility of the ENSR Project Manager (PM), the ENSR Regional Health and Safety Manager (RHSM), the ENSR Project Site Safety Officer (SSO) and all other ENSR and contractor personnel.

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1.2.1 ENSR Project Manager

The ENSR PM (Karl Reimer) is the individual who has the primary responsibility for ensuring the overall health and safety of this project. As such, the PM is responsible for ensuring that the requirements of this HASP are implemented. Some of the PM's specific responsibilities include:

- Assuring that all personnel to whom this HASP applies have received a copy of it;
- Providing the RHSM with updated information regarding environmental conditions at the site and the scope of site work;
- Providing adequate authority and resources to the on-site SSO to allow for the successful implementation of all necessary safety procedures;
- Supporting the decisions made by the SSO and RHSM;
- Maintaining regular communications with the SSO and, if necessary, the RHSM; and,
- Coordinating the activities of all subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project.

1.2.2 ENSR Regional Health and Safety Manager

The ENSR RHSM (Kathleen Harvey) is the individual responsible for the preparation, interpretation and modification of this HASP. Modifications to this HASP which may result in less stringent precautions cannot be undertaken by the PM or the SSO without the approval of the RHSM. Specific duties of the RHSM include:

- Writing, approving and amending the HASP for this project;
- Advising the PM and SSO on matters relating to health and safety for this program;
- Recommending appropriate personal protective equipment (PPE) and air monitoring instrumentation to protect personnel from potential site hazards;
- Conducting accident investigations in conjunction with the SSO; and,
- Maintaining regular contact with the PM and SSO to evaluate site conditions and new information which might require modifications to the HASP.

1.2.3 ENSR Site Safety Officer

All ENSR field technicians are responsible for implementing the safety requirements specified in this HASP. However, one field technician will serve as the SSO. The SSO will be appointed by the PM and will be on-site during all activities covered by this HASP. The SSO is responsible for enforcing the requirements of this HASP once work begins. The SSO has the authority to immediately correct all situations where noncompliance with this HASP is noted and to stop work in cases where an immediate danger is perceived. Some of the SSO's specific responsibilities include:

- Assuring that all personnel to whom this HASP applies have submitted a completed copy of the HASP receipt and acceptance form;
- Assuring that all personnel to whom this HASP applies have attended a pre-entry briefing prior to entering an exclusion zone;
- Maintaining a high level of health and safety consciousness among employees at the work site;
- Procuring and distributing the PPE needed by ENSR employees for this project;
- Verifying that all PPE and health and safety equipment used by ENSR is in good working order;
- Setting up and maintaining the work zones and assuring proper decontamination of all site personnel and equipment;
- Notifying the PM and RHSM of all noncompliance situations and stopping work in the event that an immediate danger situation is perceived;
- Monitoring and controlling the safety performance of all personnel within the established work areas to ensure that required safety and health procedures are being followed;
- Conducting accident/incident investigations and preparing accident/incident investigation reports;
- Conducting the pre-entry briefing as required by Section 10.3 of the HASP; and,
- Initiating emergency response procedures in accordance with Section 11.0 of this HASP.

1.2.4 ENSR Field Personnel and Covered Contractor Personnel

All ENSR field personnel and contractor personnel covered by this HASP are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Reading the HASP in its entirety prior to the start of on-site work;
- Submitting a completed HASP Acceptance Form and documentation of medical surveillance and training to the ENSR PM prior to the start of work;
- Attending the required pre-entry briefing prior to beginning on-site work;
- Bringing forth any questions or concerns regarding the content of the HASP to the PM or the SSO prior to the start of work;
- Reporting all accidents, injuries and illnesses, regardless of their severity, to the ENSR SSO; and,
- Complying with the requirements of this HASP and the requests of the SSO.

1.2.5 Contractors

In addition to other requirements referenced in this HASP, all contractors are required to:

- Provide appropriate PPE for their employees;
- Ensure, via daily inspections, that their equipment is maintained in good working condition;
- Operate their equipment in a safe manner; and
- Appoint an on-site safety coordinator to interface with the ENSR SSO.

1.3 Modification of the HASP

The procedures in this HASP have been developed based on a site visit and a review of historical information regarding site operations and previous investigations. Should additional information become available regarding potential on-site hazards, it may be necessary to modify this HASP. All proposed modifications to this HASP must be reviewed and approved by the ENSR RHSM before such modifications are implemented.

Any significant modifications must be incorporated into the written document as addenda and the HASP must be reissued. The ENSR PM will ensure that all personnel covered by this HASP receive copies of all issued addenda. Sign-off forms will accompany each addendum and must be signed by all personnel covered by the addendum. Sign-off forms will be submitted to the ENSR PM. The HASP addenda should be distributed during the daily safety meeting so that they can be reviewed and discussed. Attendance forms will be collected during the meeting.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Former National Plating Co. Inc. facility is located at 1501 Brewerton Road in Syracuse, New York.

The site was in use from the early 1950s to 2002 as a metal plating facility, which specialized in decorative and industrial metal finishing. Previous sampling performed by O'Brien & Gere (1987) detected elevated levels of cadmium, chromium, cyanide, nickel and zinc in surficial soil samples collected at the site. The concentrations of these inorganic constituents exceed current soil cleanup criteria, and suggest the potential for the plating operations to have impacted the condition of the property.

2.2 Areas to be Investigated

The volunteers have entered into the New York State Voluntary Cleanup Program (VCP). Based on a review of historical information and a site visit, there are two general areas of the site where investigations will be focused, including:

- Concrete Sump Pit
- Western Edge of Pavement

In addition, monitoring wells will be installed at the site, one upgradient and two downgradient of the facility.

2.2.1 Concrete Sump Pit

Process waste waters generated in the operations area were conveyed through six 1½ -inch PVC pipes to a centrally located concrete sump pit which is approximately six feet deep. Process wastewater had been discharged to the sump since at least 1970. Until the late 1980s, the sump was unlined and discharges from the sump were conveyed to the County sanitary sewer without treatment.

A polypropylene liner and wastewater treatment system were installed in 1984. Wastewater treatment consisted of batch treatment (precipitation) and pH adjustment of rinse waters prior to discharge to the municipal sanitary sewer system.

2.2.2 Western Edge of Pavement

There were four potential sources of impacts to soils along the western edge of the pavement.

- There are two floor drains in the building, one in the former storage room and one in the former polishing room. Materials utilized in the plating process and kept in the storage room did not have secondary containment. The floor drains discharged to the western exterior perimeter of the building.
- Baghouse wastes (approximately two 55-gallon drums per year) from the polishing room ventilation system were disposed in the general office trash dumpster located along the western edge of the pavement.
- Used plating tanks were reportedly stored along the western edge of the pavement in an approximately 30-foot by 30-foot area. These tanks were acquired in the late 1970's and were stored in the area for approximately one to two years.
- Blowdown from boiler discharge is assumed to migrate with over land flow to the western edge of the asphalt.

3.0 SCOPE OF WORK

3.1 Project Overview

The purpose of the proposed focused site investigation is to characterize conditions at the site.

3.2 Field Investigations

Specific field tasks being implemented to meet the project objective include the following:

- Advance a soil boring through the sump pit using a direct-push drill rig and collect a soil sample and groundwater sample, if encountered, for subsequent laboratory analyses.
- Install groundwater monitoring wells downgradient and upgradient of the facility, using hollow-stem auger drilling techniques;
- Develop each well prior to sampling;
- Measure static water levels in each well prior to sampling;
- Collect groundwater samples from each well, using low-flow sampling techniques, for subsequent laboratory analyses; and,
- Collect surface and subsurface soil samples (0-2 inches below grade and 2 feet – 3 feet below grade) from the four potential sources of impacts on the western edge of the pavement using either a Geoprobe™ or hollow stem auger and splitspoon method for sampling for subsequent laboratory analyses.

4.0 CHEMICAL HAZARD ASSESSMENT AND CONTROLS

4.1 Chemical Hazards

The site has been used for metal plating operations since approximately 1950. Metal plating processes which historically occurred at the facility are described as decorative and industrial metal finishing, including electroplating, electroless plating, buffing, and polishing of various metals. Detailed information pertaining to the specific processes used at the site is not currently available. However, processes used during metal fabrication can include metal shaping, surface preparation, surface finishing and cleaning. Surface preparation can include solvent degreasing and emulsion, alkaline and acid cleaning. Surface finishing can include anodizing, chemical conversion coating, electroplating, plating and painting.

Limited sampling performed by O'Brien & Gere (1987) detected elevated levels of cadmium, chromium, cyanide, nickel and zinc in surficial soil samples collected at the site. The concentrations of these inorganic constituents exceed current soil cleanup criteria, and suggest the potential for the plating operations to have impacted the condition of the property.

Based on the areas where sampling is proposed, the primary constituents of concern include metals and cyanide. Soils and groundwater may also have altered pH due to the use of both acidic and alkaline solutions during metal preparation and finishing as well as wastewater pre-treatment.

4.1.1 Metals

A variety of metals have been previously detected in surface soils collected by O'Brien & Gere including cadmium, chromium, nickel and zinc.

4.1.1.1 Cadmium

Cadmium can cause local skin and eye irritation. The early symptoms of overexposure, via inhalation of fumes or dusts, may include mild irritation of the upper respiratory tract, a sensation of constriction of the throat, a metallic taste and/or a cough. A period of 1-10 hours may precede the onset of rapidly progressing shortness of breath, chest pain and flu-like symptoms. Repeated overexposure to cadmium may result in kidney dysfunction/damage and an increased risk of cancer of the lung and prostate. The OSHA Permissible Exposure Limit (PEL) for cadmium is 5 ug/m3, as an 8-hour time-weighted average (TWA).

4.1.1.2 Chromium

Hexavalent chromium compounds, upon contact with the skin can cause ulceration and possibly an allergic reaction. Inhalation of hexavalent chromium dusts is irritating and corrosive to the mucous membranes of the upper respiratory tract. Chrome ulcers and chrome dermatitis are common occupational health effects from prolonged and repeated exposure to hexavalent

chromium compounds. Acute exposures to hexavalent chromium dusts may cause coughing or wheezing, pain on deep inspiration, tearing, inflammation of the conjunctiva, nasal itch and soreness or ulceration of the nasal septum. Repeated and chronic overexposures to certain forms of hexavalent chromium have been found to cause increased respiratory cancer among workers. Trivalent chromium compounds (chromic oxide) are generally considered to be of lower toxicity, although dermatitis may occur as a result of direct handling. The OSHA PEL for hexavalent chromium compounds is 0.1 mg/m3, as an 8-hr TWA.

4.1.1.3 Nickel

Skin sensitization is the most frequently seen toxic reaction to nickel and nickel compounds. This often results in chronic eczema known as "nickel itch". Nickel and its compounds are also irritants to the conjunctiva of the eye and mucous membrane of the upper respiratory tract. Studies have shown that chronic overexposures to the dusts of nickel and nickel salts can produce cancers of the lung and nasal passages. The OSHA PEL is 1 mg/m3, as an 8-hr TWA
{PRIVATE }

4.1.1.4 Zinc

Zinc metal is not considered to be hazardous. It is zinc oxide, which is considered hazardous if inhaled but this not a contaminant of concern for this program.

4.1.2 Cyanide

During electroplating, cyanide salts are used. Typical salts include potassium and sodium cyanide. Cyanide salts are granular solids that exhibit a faint almond-like odor. The primary toxic effect associated with overexposure to cyanide salts is their ability to combine in the tissues with enzymes associated with cellular oxidation. It renders oxygen unavailable to the tissues. The presence of cherry-red venous blood in cases of cyanide poisoning is due to the inability of the tissues to remove oxygen from the blood (i.e, cyanosis). The OSHA PEL for cyanide salts is 5 mg/m3, as an 8-hr TWA.

4.1.3 High or Low pH

Soils and/or groundwater may be acidic or alkaline due to the use of both types of materials, typically in liquid baths, during the metal preparation and finishing processes, as well as waste water pre-treatment. pH altered materials can cause irritation of the skin, especially if the skin is moist as well as irritation of the eyes, nose, throat and respiratory tract if the vapors or dusts of such materials are inhaled.

4.1.4 Exhaust Gases during Interior Drilling

The sump is located within the building. As such, the build up of exhaust gases from gasoline-powered internal combustion engines is a concern during the installation of the soil boring in this interior location. Carbon monoxide is the most toxic of the exhaust gases. Carbon monoxide is an asphyxiant in that it prevents hemoglobin from binding with oxygen. Symptoms of acute carbon monoxide poisoning include intense headache, dizziness, nausea, and collapse. Initially the victim is pale; later the skin and mucous membranes may turn cherry-red in color. The OSHA PEL for carbon monoxide is 35 ppm, as an 8-hour TWA with a ceiling value of 200 ppm. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a threshold limit value (TLV) of 25 ppm, as an 8-hr TWA.

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4.2 Chemical Exposure Potential

The contaminants of concern are not volatile in nature. Therefore, it is the potential for inhaling dusts that is a concern. However, the use of direct-push technology to collect subsurface soil samples and the use of hand tools to collect surface soil samples will greatly minimize the potential for the generation of dusts. Dusts may be generated during conventional auger drilling. However, the most likely route of potential exposure to the contaminants of concern will be via direct dermal contact with environmental media during sampling activities. There is also the potential for employees to transport contaminated dusts home on their shoes or clothing if contamination is surficial in nature.

4.2.1 Chemical Exposure Control

The following chemical exposure control measures will be implemented during the proposed investigations:

- To avoid direct dermal contact with potentially contaminated media, as well as the potential for contamination transport, protective clothing, as described in Section 7.1, will be required during the investigative program.
- To determine if sustained dust levels exceed the established action level during well installation, a portable dust monitor will be used, as defined in Section 6.0. To reduce the potential for dust generation during the installation of the monitoring wells, a light mist of water can be applied over the boreholes during drilling.
- If the above mentioned measures are unsuccessful in controlling the dust, work will be suspended until additional controls can be implemented, including the use of respiratory protection.
- If possible, electrical coring devices and an electric-rig will be used to advance the soil boring near the concrete sump. If this piece of equipment is not available and a drilling rig with an internal combustion engine is used, a carbon monoxide meter must be used to

monitor the build up of exhaust gas in the building. The unit will be set to alarm at 25 ppm. If the alarm sounds, work will cease and all employees will leave the building. Even if the building is well-ventilated and the exhaust gas is ducted to the outside, a CO meter is still required.

- Although highly unlikely, exposure to all of the contaminants of concern may occur via ingestion (hand-to-mouth transfer). The decontamination procedures described in Section 9.0 address personal hygiene issues that will limit the potential for contaminant ingestion.
- To prevent deposition of potentially contaminated dust on stored material within the building, plastic sheeting will be used to cover the material. The sheeting will be removed and disposed of as PPE at the completion of the investigation.

5.0 PHYSICAL HAZARDS AND CONTROLS

5.1 Working Inside the Facility

The facility is currently used for the storage of cleaning supplies (mainly soap, hangers, spot remover, etc.). None of these materials are stored in drums. Further, employees only go to the facility as needed; no employees work at the facility on a full time basis. So it is unlikely that the proposed interior drilling will pose a problem to the current site occupants. However, ENSR has arranged to have the current occupant clear an area, if necessary, around the sump so that we have clear and unrestricted access to the sump during the proposed drilling.

5.2 Utility Hazards

5.2.1 Underground Utility Hazards

New York law requires that, at least 48 hours prior to initiation of any subsurface work, a utility clearance be performed at the site. The drilling contractor will contact DIG SAFELY NEW YORK (1-800-962-7962) to request a mark-out of underground utilities in the proposed boring/monitoring well locations. Work will not begin until the required utility clearances have been performed. {PRIVATE }Public utility clearance organizations typically do not mark-out underground utility lines that are located on private property. As such, the contractor must exercise due diligence and try to identify the location of any private utilities on the property being investigated. The contractor can fulfill this requirement in several ways, including:

- obtaining as-built drawings for the areas being investigated from the property owner;
- visually reviewing each proposed drilling location with the property owner or knowledgeable site representative;
- performing a geophysical survey to locate utilities or hiring a private line locating firm to determine the location of utility lines that are present at the property;
- identifying a no- drill zone; or
- hand digging in the proposed drilling locations if insufficient data is available to accurately determine the location of the utility lines.

5.2.2 Overhead Utilities

Be particularly aware of overhead power lines in the work area. Any vehicle or mechanical equipment capable of having parts of its structure elevated (drill rig, crane etc.) near energized overhead lines

shall be operated so that a clearance of at least 10 feet is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 inches for every 10kV over that voltage.

5.3 Drilling Hazards

5.3.1 Auger Drilling

Use of a drill rig to install monitoring wells will require all personnel in the vicinity of the operating rig to wear steel-toed boots, hardhats, hearing protection and safety eyewear. Personnel shall not remain in the vicinity of operating equipment unless it is required for their work responsibilities. Additionally, the following safety requirements must be adhered to:

- All drill rigs and other machinery with exposed moving parts must be equipped with an operational emergency stop device. Drillers and geologists must be aware of the location of this device. This device must be tested prior to job initiation and periodically thereafter. The driller and helper shall not simultaneously handle augers unless there is a standby person to activate the emergency stop.

- The driller must never leave the controls while the tools are rotating unless all personnel are kept clear of rotating equipment.

- A long-handled shovel or equivalent must be used to clear drill cuttings away from the hole and from rotating tools. Hands and/or feet are not to be used for this purpose.

- A remote sampling device must be used to sample drill cuttings if the tools are rotating or if the tools are readily capable of rotating. Samplers must not reach into or near the rotating equipment. If personnel must work near any tools which could rotate, the driller must shut down the rig prior to initiating such work.

- Drillers, helpers and geologists must secure all loose clothing when in the vicinity of drilling operations.

- Only equipment that has been approved by the manufacturer may be used in conjunction with site equipment and specifically to attach sections of drilling tools together. Pins that protrude excessively from augers shall not be allowed

- No person shall climb the drill mast while tools are rotating.

- No person shall climb the drill mast without the use of ANSI-approved fall protection (approved belts, lanyards and a fall protection slide rail) or portable ladder which meets the requirements of OSHA standards.

5.3.2 Geoprobe Drilling

Use of the Geoprobe System to advance a soil boring near the sump will require all personnel in the vicinity of the operating unit to wear steel-toed boots, hardhats, hearing protection and safety eyewear. Personnel shall not remain in the vicinity of operating equipment unless it is required for their work responsibilities. Additionally, the following safety requirements must be adhered to:

- A remote vehicle ignition is located on the control panel of the Geoprobe unit. This allows the operator to start and stop the vehicle engine from the rear. This device must be tested prior to job initiation and periodically thereafter. All employees should be aware of how to access and operate the rear ignition.
- The driller must never leave the controls while the probe is being driven.
- Drillers, helpers and geologists must secure all loose clothing when in the vicinity of drilling operations.
- The Geoprobe vehicle shall not be moved any distance with the probe in the extended position. Check for clearance at roof or the vehicle before folding the Geoprobe out of the carrier vehicle.
- Be sure the parking brake is set before probing.
- Never allow the derrick foot to be lifted more than 6" off of the ground surface.
- Deactivate hydraulics when adding or removing probe rods, anvils or any tool in the hammer.
- Verify that all threaded parts are completely threaded together before probing.

5.4 Cuts and Lacerations

Employees are at an increased risk of cutting themselves with the knives used to cut tubing that is used for groundwater sampling. Similarly, the acetate soil liners used for geoprobe soil sampling must also be cut open to collect the sample. If a tube cutter is not used for cutting tubing or the acetate sleeve and a knife or blade must be used, follow the safety precautions listed below:{PRIVATE }

- Keep your free hand out of the way and secure your work if cutting through thick material

- Use only sharp blades; dull blades require more force which results in less knife control
- Pull the knife toward you; pulling motions are easier to manage
- Don't put your knife in your pocket
- Use a self-retracting blade or a linoleum knife
- Wear leather or Kevlar™ gloves when using knives or blades.

5.5 Noise Exposure

The use of the drilling rig will generate noise levels that will require the use of hearing protection in the immediate vicinity. Appropriate earmuffs or earplugs (i.e., with an NRR greater than 25 dB) should be worn to prevent overexposure. The general rule of thumb is that if you have to raise your voice to be understood by someone who is standing 3 to 5 feet away from you, the noise levels are likely to be above 85 dB and therefore require the use of hearing protection.

5.6 Back Safety

Using the proper techniques to lift and move heavy pieces of equipment is important to reduce the potential for back injury. The following precautions should be implemented when lifting or moving heavy objects:

- Use mechanical devices to move objects that are too heavy to be moved manually
- If mechanical devices are not available, ask another person to assist you.
- Bend at the knees, not the waist. Let your legs do the lifting.
- Do not twist while lifting
- Bring the load as close to you as possible before lifting
- Be sure the path you are taking while carrying a heavy object is free of obstructions and slip, trip and fall hazards.

5.7 Electrical Safety

If using portable tools that are electrically powered, follow the safety precautions listed below:{PRIVATE }

- Check to see that electrical outlets used to supply power during field operations is of the three wire grounding type.
- Extension cords used for field operations should be of the three wire grounding type and designed for hard or extra-hard usage. This type of cord uses insulated wires within an inner insulated sleeve and will be marked S, ST, STO, SJ, SJO or SJTO.
- NEVER remove the ground plug blade to accommodate ungrounded outlets.
- Do not use extension cords as a substitute for fixed or permanent wiring. Do not run extension cords through openings in walls, ceilings or floors.
- Protect the cord from becoming damaged if the cord is run through doorways, windows or across pinch points.
- Examine extension and equipment cords and plugs prior to each use. Damaged cords with frayed insulation or exposed wiring and damaged plugs with missing ground blades MUST BE REMOVED from service immediately.
- All portable or temporary wiring which is used outdoors or in other potentially wet or damp locations must be connected to a circuit that is protected by a ground fault circuit interrupter (GFCI). GFCI's are available as permanently installed outlets, as plug-in adapters and as extension cord outlet boxes. DO NOT CONTINUE TO USE A PIECE OF EQUIPMENT OR EXTENSION CORD THAT CAUSES A GFCI TO TRIP.
- When working in flammable atmospheres, be sure that the electrical equipment being used is approved for use in Class I, Division I atmospheres.
- Do not touch a victim who is still in contact with current. Separate the victim from the source using a dry, nonmetallic item such as a broomstick or cardboard box. Be sure your hands are dry and you are standing on a dry surface. Turn off the main electrical power switch and then begin rescue efforts.

5.8 Thermal Stress

5.8.1 Heat Stress

Types of Heat Stress

Heat related problems include **heat rash, fainting, heat cramps, heat exhaustion and heat stroke**. **Heat rash** can occur when sweat isn't allowed to evaporate, leaving the skin wet most of the time and making it subject to irritation. **Fainting** may occur when blood pools to lower parts of the body and as a result, does not return to the heart to be pumped to the brain. Heat related fainting often occurs during activities that require standing erect and immobile in the heat for long periods of time. **Heat cramps** are painful spasms of the muscles due to excessive salt loss associated with profuse sweating. **Heat exhaustion** results from the loss of large amounts of fluid and excessive loss of salt from profuse sweating. The skin will be clammy and moist and the affected individual may exhibit giddiness, nausea and headache.

Heat stroke occurs when the body's temperature regulatory system has failed. The skin is hot, dry, red and spotted. The affected person may be mentally confused and delirious. Convulsions could occur. EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH. A person exhibiting signs of heat stroke should be removed from the work area to a shaded area. The person should be soaked with water to promote evaporation. Fan the person's body to increase cooling.

Early Symptoms of Heat-Related Health Problems:

- decline in task performance
- incoordination
- decline in alertness
- unsteady walk
- excessive fatigue
- reduced vigilance
- muscle cramps
- dizziness

Susceptibility to Heat Stress Increases due to:

- lack of physical fitness
- lack of acclimation
- increased age
- dehydration
- obesity
- drug or alcohol use
- sunburn
- infection

People unaccustomed to heat are particularly susceptible to heat fatigue. First timers in PPE need to gradually adjust to the heat.

The Effect of Personal Protective Equipment

Sweating normally cools the body as moisture is removed from the skin by evaporation. However, the wearing of certain personal protective equipment (PPE), particularly chemical protective coveralls (e.g., Tyvek), reduces the body's ability to evaporate sweat and thereby regulate heat buildup. The body's efforts to maintain an acceptable temperature can therefore become significantly impaired by the wearing of PPE.

Measures to Avoid Heat Stress:

The following guidelines should be adhered to when working in hot environments:

- Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
- Identify a shaded, cool rest area.
- Rotate personnel, alternative job functions.
- Water intake should be equal to the sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst. DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK. For an 8-hour workday, 50 ounces of fluids should be drunk.
- Eat lightly salted foods or drink salted drinks such as Gatorade to replace lost salt.
- Save most strenuous tasks for non-peak heat hours such as the early morning or at night.
- Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.
- Avoid double shifts and/or overtime.

The implementation and enforcement of the above mentioned measures will be the joint responsibility of the project manager, on-site field coordinator, and health and safety officer. Potable water and fruit juices should be made available each day for the field team.

Heat Stress Monitoring Techniques

Site personnel should regularly monitor their heart rate as an indicator of heat strain by the following method: Check radial pulse rates by using fore-and middle fingers and applying light pressure to the pulse in the wrist for one minute at the beginning of each rest cycle. If the pulse rate exceeds 110 beat/minute, shorten the next work cycle by one-third and keep the rest period the same. If, after the next rest period, the pulse rate still exceeds 110 beats/minute, shorten the work cycle by one-third.

5.8.2 Cold Stress

Types of Cold Stress

Cold injury is classified as either localized, as in frostbite, frostnip or chilblain; or generalized, as in hypothermia. The main factors contributing to cold injury are exposure to humidity and high winds, contact with wetness and inadequate clothing.

The likelihood of developing frostbite occurs when the face or extremities are exposed to a cold wind in addition to cold temperatures. The freezing point of the skin is about 30° F. The fluids around the cells of the body tissue freeze, causing the skin to turn white. This freezing is due to exposure to extremely low temperatures. As wind velocity increases, heat loss is greater and frostbite will occur more rapidly.

Symptoms of Cold Stress

The first symptom of frostbite is usually an uncomfortable sensation of coldness, followed by numbness. There may be a tingling, stinging or aching feeling in the effected area. The most vulnerable parts of the body are the nose, cheeks, ears, fingers and toes.

Symptoms of hypothermia, a condition of abnormally low body temperature, include uncontrollable shivering and sensations of cold. The heartbeat slows and may become irregular, the pulse weakens and the blood pressure changes. Pain in the extremities and severe shivering can be the first warning of dangerous exposure to cold.

Maximum severe shivering develops when the body temperature has fallen to 95° F. This must be taken as a sign of danger and exposure to cold must be immediately terminated. Productive physical and mental work is limited when severe shivering occurs.

Methods to Prevent Cold Stress

When the ambient temperature, or a wind chill equivalent, falls to below 40° F (American Conference of Governmental Industrial Hygienists recommendation), site personnel who must remain outdoors should wear insulated coveralls, insulated boot liners, hard hat helmet liners and insulated hand protection. Wool mittens are more efficient insulators than gloves. Keeping the head covered is very important, since 40% of body heat can be lost when the head is exposed. If it is not necessary to wear a hard hat, a wool knit cap provides the best head protection. A face mask may also be worn.

Persons should dress in several layers rather than one single heavy outer garment. The outer piece of clothing should ideally be wind and water proof. Clothing made of thin cotton fabric or synthetic fabrics such as polypropylene is ideal since it helps to evaporate sweat. Polypropylene is best at wicking away moisture while still retaining its insulating properties. Loosely fitting clothing also aids in sweat evaporation. Denim is not a good protective fabric. It is loosely woven which allows moisture to penetrate. Socks with a high wool content are best. If two pairs of socks are worn, the inner sock should be smaller and made of cotton, polypropylene or a similiar type of synthetic material that wicks away moisture. If clothing becomes wet, it should be taken off immediately and a dry set of clothing put on.

If wind conditions become severe, it may become necessary to shield the work area temporarily. The SSO and the PM will determine if this type of action is necessary. Heated break trailers or a designated area that is heated should be available if work is performed continuously in the cold at temperatures, or equivalent wind chill temperatures, of 20° F.

Dehydration occurs in the cold environment and may increase the susceptibility of the worker to cold injury due to significant change in blood flow to the extremities. Drink plenty of fluids, but limit the intake of caffeine.

6.0 AIR MONITORING

6.1 Direct Reading Instruments

The contaminants of concern are non-volatile. Therefore, it is the potential for inhaling dusts during the implementation of this field program that is a concern to the field team. However, the use of direct-push technology to collect subsurface soil samples and the use of hand tools to collect surface soil samples will greatly minimize the potential for the generation of dusts. Therefore, monitoring for dusts will be limited to those activities that may generate dust, which for this program involves the installation of monitoring wells using conventional auger drilling.

Instrument 1: Dust Monitor - MIE pDR 2000 or equivalent

A dust monitor, such as a MIE pDR 2000 or equivalent, will be used to measure the total dust concentration generated during the installation of groundwater monitoring wells. The monitor will be used to measure dust concentrations generated in the immediate work areas. The action level* for total dust in the worker's breathing zone is 0.36 mg/m3. This level is based upon the presence of cadmium at concentrations up to 1,400 mg/kg (west edge of pavement), its PEL of 5 µg/m3 and an applied safety factor of 10 due to cadmium's carcinogenicity.

$$\text{Action Level} = \frac{(1E^{+6})(\text{exposure limit mg/m3})}{(\text{concentration mg/kg})(\text{safety factor } 10)}$$

Engineering controls, such as the application of a fine mist of water over the boreholes, will be implemented if total dust concentrations exceed the action level. If engineering controls are unsuccessful in keeping the dust concentration below the action level, respiratory protection will be donned.

Instrument 2 - Carbon Monoxide Meter

If electric sampling equipment is not available and traditional drilling techniques (internal combustion engine) are used to advance the boring within the building, a carbon monoxide meter must be used to monitor the build up of exhaust gas in the building. The unit will be set to alarm at 25 ppm. If the alarm sounds, work will cease and all employees will leave the building until the levels of CO have been removed. If levels continue to exceed 25 ppm, mechanical ventilation will be required to remove the vapors from the work area as the use of air-purifying respiratory protection is not applicable. Even if the building is well-ventilated and the exhaust gas is ducted to the outside, a CO meter is still required.

6.2 Personal Air Sampling

OSHA does not require the collection of personal air sampling during the proposed activities. As such, this type of monitoring will not be conducted by ENSR during any of the proposed tasks.

6.3 Instrument Calibration and Recordkeeping

The dust monitor will be sent for calibration several weeks before the commencement of investigation activities at the site. In accordance with the manufacturer's instructions, a zero value update will be performed every 8 hours if the unit is operated in high particle concentration (>5 mg/m^3) environments. At aerosol concentrations below 1 mg/m^3, this update will be performed on a weekly basis. If at any time the zero value exceeds 2.5 mg/m^3, the sensor will be cleaned. If the zero value still exceeds 1.0 mg/m^3, the unit will be sent out for factory calibration (manufacturers suggested maintenance). A new unit will be made immediately available.

A log of total dust readings will be recorded at least once every 30 minutes and kept in the field notebook. Daily calibration information will also be recorded in the field notebook unless separate equipment calibration logs are maintained on site.

ENSR will request that the rental agency calibrate the carbon monoxide meter the day before the unit is to be used. The calibration record will be kept in the project files.

6.4 Community Air Monitoring Program (CAMP)

As required by the New York State Department of Health, a CAMP has been prepared for the instrusive activities being performed during this investigation and more specifically, for the installation of the groundwater monitoring wells. Due to the limited nature of the dust-producing work being performed, ENSR proposes the following work area perimeter monitoring. As indicated above, the presence of total dust will be monitored at the immediate work area. If sustained readings for total dust are detected in the breathing zone at the NYSDOH action limit of 100 ug/m3, initial perimeter air monitoring will be conducted. This monitoring will be conducted in a "step out" radial pattern of 5-foot intervals up to approximately 10 to 20 feet downwind of the work area. If elevated readings (i.e. total dust readings exceeding 100 ug/m3) are detected at downwind locations, the engineering controls being used to control dust will be increased. Work will not proceed until the increased controls are implemented and total dust levels at the perimeter locations are below the action levels.

A record of all perimeter air monitoring readings, including the time recorded, location, and reading, as well as a description of activities that resulted in elevated readings and response actions taken, will be maintained.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) will be worn during sampling activities to prevent on-site personnel from being injured by the safety hazards posed by the site and/or the activities being performed. The following table describes the PPE and chemical protective clothing to be worn for general site activities and for certain specific tasks.

7.1 Chemical Protective Clothing

To put checkmarks in the any of the table's boxes, highlight one of the checkmark that is already located in the table and select Edit and Copy. Place your cursor in the appropriate box and select Edit and Paste. Additional check marks can be inserted by placing the cursor in the appropriate and simply hitting "Ctrl-V". Don't worry, the blue text that is underlined in dots will not print.

PPE Item	Task 1	Task 2	Task 3	Task 4
Hard Hat		✓	✓	
Steel Toed Safety Shoes	✓	✓	✓	✓
Safety Glasses with Sideshields	✓	✓	✓	✓
Tyvek coveralls	*			
Kevlar or Leather gloves		*		*
Disposable Best N-Dex Nitrile gloves	✓	✓	✓	✓
Hearing Protection		✓	✓	

Task 1 –Surface Soil Sampling
* if employees kneel on impacted surface soils to collect samples

Task 2 - Geoprobe Sampling
* -when cutting acetate soil liners

Task 3 - Well Installation

Task 4 - Water Level Measurements/Groundwater Sampling
* -when cutting tubing for sampling

7.2 Respiratory Protection

A dust monitor will be used to measure the total dust concentration generated during the installation of groundwater monitoring wells. If the action limit of 0.36 mg/m3 is sustained for 15-minutes within employee breathing zones, engineering controls, such as the application of a fine mist of water over

the boreholes, will be implemented. If engineering controls are unsuccessful in keeping the dust concentration below the action level, respiratory protection will be donned.

Level C Respiratory Protection - Half-mask air-purifying respirator with P-100 filters

Employees who are expected to don respiratory protection must have successfully passed a fit-test within the past year for the brand and model respirator they plan to wear for this program.

If electric sampling equipment is not available and traditional drilling techniques (internal combustion engine) are used to advance the boring within the building, a carbon monoxide meter must be used to monitor the build up of exhaust gas in the building. The unit will be set to alarm at 25 ppm. If the alarm sounds, work will cease and all employees will leave the building until the levels of CO have been removed. If levels continue to exceed 25 ppm, mechanical ventilation will be required to remove the vapors from the work area as the use of air-purifying respiratory protection is not applicable.

7.3 Other Protective Equipment

The following additional safety items should be available at the site:

- Portable, hand-held eyewash bottles
- First aid kit
- Type 10A:40B:C fire extinguisher (on drill rig is sufficient)
- Portable phones

8.0 SITE CONTROL

8.1 Work Zones

To prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, work areas and personal protective equipment requirements will be clearly identified. ENSR designates work areas or zones as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, November, 1985. They recommend the areas surrounding each of the work areas to be divided into three zones:

- Exclusion or "hot" Zone
- Contamination Reduction Zone (CRZ)
- Support Zone

8.1.1 Exclusion Zone

The facility is essentially non-operational. Therefore, establishing formal exclusion zones during the proposed soil boring/well installation program is not required. However, all personnel entering the active work area must be trained in accordance with the requirements defined in Section 10.2 of this HASP and must wear the prescribed level of personal protective equipment.

8.1.2 Contamination Reduction Zone

The decontamination zone will be established adjacent to the work zone. Personnel will remove contaminated gloves and other disposable items in this area and place them in a plastic bag until they can be properly disposed of.

8.1.3 Support Zone

At this site the support zone will include the area outside of the work area.

8.2 Safety Practices

The following measures are designed to augment the specific health and safety guidelines provided in this plan.

- The "buddy system" will be used at all times by all field personnel. No one is to perform field work alone. Standby team member must be intimately familiar with the procedures for initiating an emergency response.
- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the immediate work area and the decontamination zone.
- Smoking is prohibited in all work areas. Matches and lighters are not allowed in these areas.

- Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking or any other activities.
- Beards or other facial hair that interfere with respirator fit are prohibited.
- The use of alcohol or illicit drugs is prohibited during the conduct of field operations.
- All equipment must be decontaminated or properly discarded before leaving the site in accordance with the project work plan.

9.0 DECONTAMINATION

9.1 Personal Decontamination

Proper decontamination is required of all personnel before leaving the site. Decontamination will occur within the contamination reduction zone. Disposable PPE will be removed in the decontamination zone and placed in garbage bags and disposed of as general refuse.

Regardless of the type of decontamination system required, a container of potable water and liquid soap should be made available so employees can wash their hands before leaving the site for lunch or for the day.

10.0 MEDICAL MONITORING AND TRAINING REQUIREMENTS

10.1 Medical Monitoring

All personnel performing activities covered by this HASP must be active participants in a medical monitoring program that complies with 29 CFR 1910.120(f). Each individual must have completed an annual surveillance examination and/or an initial baseline examination within the last year prior to performing any work on the site covered by this HASP.

10.2 Health and Safety Training

10.2.1 HAZWOPER

All personnel performing activities covered by this HASP must have completed the appropriate training requirements specified in 29 CFR 1910.120(e). Each individual must have completed an annual 8-hour refresher-training course and/or initial 40-hour training course within the last year prior to performing any work on the sites covered by this HASP.

10.2.2 Pre-Entry Briefing

The SSO will conduct a pre-entry briefing before site activities begin. HASP receipt and acceptance sheets will be collected at this meeting. Short safety refresher meetings will be conducted, as needed, throughout the duration of the project. Attendance of the pre-entry meeting is mandatory and will be documented by the ENSR SSO. An attendance form is presented in Attachment B.

11.0 EMERGENCY RESPONSE

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result in an uncontrolled release of a hazardous substance." According to ENSR policy, ENSR personnel shall not participate in any emergency response where there are potential safety or health hazards (i.e., fire, explosion, or chemical exposure). ENSR response actions will be limited to evacuation and medical/first aid as described within this section below. As such this section is written to comply with the requirements of 29 CFR 1910.38 (a).

The basic elements of an emergency evacuation plan include:

- employee training,
- alarm systems,
- escape routes,
- escape procedures,
- critical operations or equipment,
- rescue and medical duty assignments,
- designation of responsible parties,
- emergency reporting procedures and
- methods to account for all employees after evacuation.

11.1 Employee Training

Employees must be instructed in the site-specific aspects of emergency evacuation. This information will be communicated to the field team during the pre-entry briefing. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed.

11.2 Alarm Systems/Emergency Signals

An emergency communication system must be in effect at all sites. The most simple and effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial site activity and periodically as the work progresses. Verbal communications must be supplemented anytime voices can not be clearly perceived above ambient noise levels (i.e., noise from heavy equipment; drilling rigs, backhoes, etc.) and anytime a clear line-of-sight can not be easily maintained amongst all ENSR personnel because of distance, terrain or other obstructions.

Verbal communications will be adequate to warn employees of hazards associated with the immediate work area. The facility is non-operational so ENSR will not have access to telephone

facilities. Therefore, cellular phones will be brought to the site to facilitate contact with local emergency responders.

11.3 Escape Routes and Procedures

The escape routes from the work area will be via internal facility roads to Brewerton Road. The escape routes and assembly areas will be reviewed during the pre-entry briefing. All personnel on site are responsible for knowing the escape route from the site and where to assemble after evacuation.

11.4 Rescue and Medical Duty Assignments

The phone numbers of the police and fire departments, ambulance service, local hospital, and ENSR representatives are provided in the emergency reference sheet. This sheet will be posted in the site vehicle.

In the event an injury or illness requires more than first aid treatment, the SSO will accompany the injured person to the medical facility and will remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the on-site project manager and the RHSM.

If the injured employee can be moved from the accident area, he or she will be brought to the CRZ where their PPE will be removed. If the person is suffering from a back or neck injury the person will not be moved and the requirements for decontamination do not apply. The SSO must familiarize the responding emergency personnel about the nature of the site and the injury. If the responder feels that the PPE can be cut away from the injured person's body, this will be done on-site. If this not feasible, decontamination will be performed after the injured person has been stabilized.

11.5 Designation of Responsible Parties

The SSO is responsible for initiating emergency response. In the event the SSO can not fulfill this duty, the alternate SSO will take charge.

11.6 Employee Accounting Method

The SSO is responsible for identifying all ENSR personnel on-site at all times. On small, short duration jobs this can be done informally as long as accurate accounting is possible.

11.7 Accident Reporting and Investigation

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage requires an accident investigation and report. The investigation should be conducted as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided. An ENSR accident investigation form is presented in Attachment C of this HASP. The injured ENSR employee's supervisor and the RHSM should be notified immediately of the injury.

If a subcontractor employee is injured, they are required to notify the ENSR SSO. Once the incident is under control, the subcontractor will submit a copy of their company's accident investigation report to the ENSR SSO.

EMERGENCY REFERENCES

Ambulance: 9-1-1

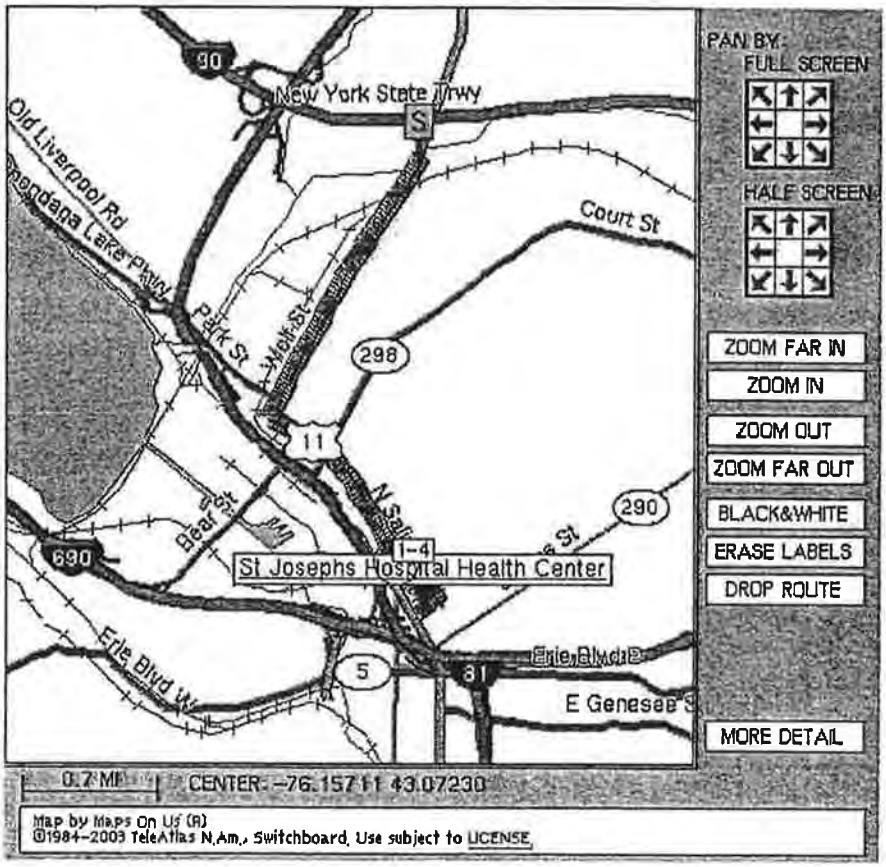
Fire: 9-1-1

Police: 9-1-1

Medical Services: 315-448-5111

St. Josephs Hospital Health Center
301 Prospect Ave
Syracuse, NY

Directions to Hospital: From Brewerton Road, head south on US 11. Go 2.6 miles and continue onto Prospect Ave. Go 0.2 miles and turn left onto E. Laurel St. Go less than 0.1 miles and turn right onto N. Townsend Ave. Go 0.1 mile and turn right onto Union. Go 0.1 mile to hospital.



Dont' forget to add the basic directions to the hospital prior to issuing the HASP. Don't use "To be Determined Upon Arrival at the Site". Don't worry, this won't print.

ENSR Project Representatives:

ENSR/WESTFORD, MA	978-589-3000
-Kathleen Harvey (RHSM)	x 3325
ENSR/SYRACUSE, NY	315-432-0506
-Karl Reimer (PM) x233	

Attachment A

Health and Safety Plan Receipt and Acceptance Form

Health and Safety Plan Receipt and Acceptance Form

Focused Site Investigation
Former National Plating Co. Inc. Site
1501 Brewerton Road
Syracuse, New York

I have received a copy of the Health and Safety Plan prepared for the above-referenced site and activities. I have read and understood its contents and I agree that I will abide by its requirements.

Name (Print) _____

Signature _____ Date: _____

Representing (Print) _____
Company Name

Attachment B

Health and Safety Plan Pre-Entry Briefing Attendance Form

Focused Site Investigation
Former National Plating Co. Inc. Site
1501 Brewerton Road
Syracuse, New York

Briefing Conducted By: _____

Date Performed: _____

Printed Name	Signature	Representing

APPENDIX C

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP) is intended 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. If the action levels provided below are exceeded, additional requirements including increased monitoring, corrective actions to abate emissions, and/or work shutdown may be required. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

Reliance on the CAMP should not preclude simple, common-sense measures to keep dust and odors at a minimum around the work areas.

Particulate Monitoring

The presence of total dust will be monitored at the immediate work area. If sustained readings for total dust are detected in the breathing zone at the NYSDOH action limit of 100 ug/m^3, initial perimeter air monitoring will be conducted. This monitoring will be conducted in a "step out" radial pattern of 5-foot intervals up to approximately 10 to 20 feet downwind of the work area. If elevated readings (i.e. total dust readings exceeding 100 ug/m^3) are detected at downwind locations, the engineering controls being used to control dust will be increased. Work will not proceed until the increased controls are implemented and total dust levels at the perimeter locations are below the action levels.

A record of all perimeter air monitoring readings, including the time recorded, location, and reading, as well as a description of activities that resulted in elevated readings and response actions taken, will be maintained.

AIR MONITORING RESPONSE AND ACTIONS

Former National Plating Facility
Syracuse, New York

Constituent Monitored	Response Level (above background)	Action
Community Air Monitoring		
Particulates (15-minute average)	100 ug/m^3 or airborne dust observed leaving work area	• Dust suppresion techniques must be employed. • Work may continue as long as downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and no visible dust is migrating from the work area.
	150 ug/m^3	• Work must be stopped and a re-evaluation of activities initiated. • Work can resume provided that dust suppresion measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m3 of the upwind level and in preventing visible dust migration.
Air Monitoring for Indoor Drilling Activities		
Carbon Monoxide	25 ppm	• Work activities must be halted and all employees will leave the work area and/or building. • Work can resume provided that mechanical ventilation reduces the carbon monoxide concentration below 25 ppm.

Notes:

Action levels from NYSDOH Generic Community Air Monitoring Plan (NYSDOH, June 2000).
Action levels are not intended for use in determining worker respiratory protection. Worker respiratory protection is evaluated in the Health and Safety Plan (provided in Attachment B).

APPENDIX I
SITE MANAGEMENT FORMS

PLUMLEY ENGINEERING, P.C.

GROUNDWATER SAMPLING FIELD LOG

Client/Site: Former National Plating **Project No.:** 2010150.006
Monitoring Location: _____ **Date:** _____
Source Description: _____ **Sampler:** _____

Well & Water Level Data:
Total Depth of Well: _____ **feet**
Initial Depth to Water: _____ **feet**
Length of Water Column (LWC): _____ **feet**

Purge Volume Calculation:

Well Diameter (inches):	Calculated Well Volume To Be Removed
1	LWC * 0.041 * 3 = _____ Gallons
1.25	LWC * 0.064 * 3 = _____ Gallons
1.5	LWC * 0.092 * 3 = _____ Gallons
2	LWC * 0.163 * 3 = _____ Gallons
3	LWC * 0.367 * 3 = _____ Gallons
4	LWC * 0.653 * 3 = _____ Gallons
6	LWC * 1.469 * 3 = _____ Gallons

Free Product Check: **Free Product Present:** **Yes** **No**
Measured Thickness/Comment: _____

Purge Data: **Purge Date:** _____
Purging Time: **From:** _____ **To:** _____
Type of Purging Equipment Used: _____
Purged Water Comments: _____

Sampling Data: **Depth to Water at Sampling:** _____ **feet**
Color of Sample: _____ **Sample Date:** _____
Turbidity: _____ **Sample Time:** _____
Type of Sampling Equipment Used: _____

Field Indicators Present During Sample Collection:
Odor _____
Sheen _____
Free Product _____
None _____

Notes:
_____
_____
_____

Weather: **Temperature °F** _____ **Sunny** **Cloudy** **Rain** **Snow**

Revised 08/15/07

LOG SHEET

FORMER NATIONAL PLATING SITE
Town of Salina, Onondaga County, New York

Date	Gauge Reading (Inches of Water)	Comments	Signature

ANNUAL SYSTEM INSPECTION FORM

FORMER NATIONAL PLATING SITE
Town of Salina, Onondaga County, New York

Complete the following questions and note relevant comments below:

1.	Does the manometer indicate negative pressure is being maintained below the slab?	Yes ☐	No ☐
2.	Is the vent fan operational?	Yes ☐	No ☐
3.	Are there any concerns with the visible system piping?	Yes ☐	No ☐
4.	Is the manometer operational?	Yes ☐	No ☐
5.	Are system labels intact and readable?	Yes ☐	No ☐
6.	Are any cracks or new penetrations visible in the building slab?	Yes ☐	No ☐
7.	Is the discharge line intact and functioning?	Yes ☐	No ☐
8.	Have any new air intakes been installed, and if so, are they near the discharge point?	Yes ☐	No ☐

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Printed Name: _____ Date: _____

Signature: _____

Summary of Green Remediation Metrics for Site Management

Site Name: _____ Site Code: _____
Address: _____ City: _____
State: _____ Zip Code: _____ County: _____

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: _____

Current Reporting Period
Reporting Period From: _____ To: _____

Contact Information
Preparer's Name: _____ Phone No.: _____
Preparer's Affiliation: _____

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CERTIFICATION BY CONTRACTOR
I, _____ (**Name**) do hereby certify that I am _____ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application. _____ **Date** **Contractor**

APPENDIX J
O&M MANUAL (FOR EACH ACTIVE EC)

PLUMLEY
ENGINEERING
Civil and Environmental Engineering

SOIL VAPOR MITIGATION
OPERATION AND MAINTENANCE MANUAL

for the

FORMER NATIONAL PLATING SITE
Town of Salina, Onondaga County, New York
DEC Site No. V00264
Project No. 2010150

This Manual has been prepared in accordance with Section 4.4 of the October 2006 New York State Department of Health (NYSDOH) *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. Maintenance and inspection procedures are presented to ensure the continued proper operation of the systems.

SYSTEM DESCRIPTION

A sub-slab vapor collection system was installed beneath the concrete floor slab, as detailed below:

- A Radon Away RP265 exhaust fan capable of producing approximately 0.65 inches of water vacuum at flow rates of approximately 210 cubic feet per minute (cfm) were installed on the 6-inch diameter polyvinyl chloride (PVC) riser outside the building via a flexible coupling to draw air from the sub-slab soil atmosphere. The exhaust fan was hard-wired in conformance with the National Electric Code and applicable local codes.

- A fan speed control was incorporated within the electrical circuit to the exhaust fan and is accessible by facility personnel.

- A Dwyer U-Tube Manometer capable of measuring 4 inches of water column vacuum was installed at eye level and in plain view to measure the vacuum in the sub-slab depressurization (SSD) system vent pipe before the fan.

8232 LOOP ROAD, BALDWINSVILLE, NY 13027 Telephone: (315) 638-8587 Fax: (315) 638-9740
200 NORTH GEORGE STREET, ROME, NY 13440 Telephone: (315) 281-1005 Fax: (315) 334-4394
Internet: www.plumleyeng.com

- A rain deflector cap was installed on top of the exhaust stack to minimize the potential for rainwater to enter the system.

- System components were clearly marked and labeled.

The system was activated following installation and smoke tests confirmed that vacuum pressure was being maintained at distant locations within the buildings.

OPERATION AND MAINTENANCE PROCEDURES

The following procedures will be performed as part of this management plan following training of maintenance personnel by a qualified environmental professional:

- Maintenance personnel will routinely observe the readily accessible manometer. Readings will be recorded on the attached *Log Sheet* and maintained adjacent to the manometer.

- Annual visual inspections of the system will include the vent fan, piping, manometer and labeling.

- An annual evaluation of the concrete floors will be performed to assess potential leaks through cracks or new floor penetrations.

- The discharge line will be inspected annually to assess whether new air intakes have been installed nearby.

Annual inspections will be documented on the attached *Annual System Inspection Form*.

LOG SHEET

FORMER NATIONAL PLATING SITE
Town of Salina, Onondaga County, New York

Date	Gauge Reading (Inches of Water)	Comments	Signature

ANNUAL SYSTEM INSPECTION FORM

FORMER NATIONAL PLATING SITE
Town of Salina, Onondaga County, New York

Complete the following questions and note relevant comments below:

1.	Does the manometer indicate negative pressure is being maintained below the slab?	Yes ☐	No ☐
2.	Is the vent fan operational?	Yes ☐	No ☐
3.	Are there any concerns with the visible system piping?	Yes ☐	No ☐
4.	Is the manometer operational?	Yes ☐	No ☐
5.	Are system labels intact and readable?	Yes ☐	No ☐
6.	Are any cracks or new penetrations visible in the building slab?	Yes ☐	No ☐
7.	Is the discharge line intact and functioning?	Yes ☐	No ☐
8.	Have any new air intakes been installed, and if so, are they near the discharge point?	Yes ☐	No ☐

Comments:

Printed Name: _____ Date: _____

Signature: _____

RadonAway
The world's leading radon fan manufacturer

RP PRO SERIES

INSTALLS WHITE, STAYS WHITE

Radon Mitigation Fan

All RadonAway® fans are specifically designed for radon mitigation. RP Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

- NEW Stay-White™ housing
- Energy efficient
- RP140 - ENERGY STAR Most Efficient 2017
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140 & RP145 double snap sealed)
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

MODEL	P/N	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140	28460	4"	15-21	0.7	135	70	-	-	-
RP145	28461	4"	41-72	1.7	166	126	82	41	3
RP260	28462	6"	47-65	1.3	251	157	70	-	-
RP265	28463	6"	91-129	2.2	334	247	176	116	52
RP380*	28208	8"	95-152	2.0	497	353	220	130	38

*Currently not stay-white material.

Model	A	B	C
RP140	4.5"	9.7"	8.5"
RP145	4.5"	9.7"	8.5"
RP260	6"	11.75"	8.6"
RP265	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

Made in USA with U.S. and imported parts.

ETL Listed

All RadonAway® inline radon fans are covered by our 5-year, hassle-free warranty.

Most Efficient 2017 RP140 Only

For Further Information, Contact Your Radon Professional:

Rev D 0517
P/N 02047