Mr. Benjamin McPherson
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New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

# Remedial Investigation Workplan

Site #915210 – Morgan Materials Hertel Warehouse
373 Hertel Avenue
Buffalo, New York 14207

July 18, 2019

**Remedial Investigation Workplan**
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373 Hertel Avenue
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Prepared for:
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Date:
July 18, 2019

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# Table

# Acronyms

| | |
|---|---|
| bg | Below grade |
| CAMP | Community Air Monitoring Plan |
| CERCLA | Comprehensive Environmental Remediation, Compensation and Liability Act |
| CoC | Chain of custody |
| DER-10 | Department of Environmental Remediation-10 |
| DO | Dissolved Oxygen |
| DUSR | Data Usability Summary Report |
| ECs | Emerging contaminants |
| EDDs | Electronic data deliverables |
| EIMS | Environmental Information Management System |
| eV | Electron volt |
| ft | Feet |
| Full Suite | Analysis of TCL VOCs via USEPA Method 8260C, TCL SVOCs via USEPA Method 8270D, PCBs via USEPA method 8082A, pesticides via USEPA Method 8081B, total cyanide via USEPA Method 9012B, hexavalent chromium via USEPA Method 7196A, TAL metals including mercury via USEPA Method 6010C/7471A, ECs PFAS via USEPA Method 537 Modified and 1,4-dioxane via USEPA Method 8270D SIM ID |
| GES | Groundwater & Environmental Services, Inc. |
| GPR | Ground Penetrating Radar |
| GPS | Global Positioning System |
| HASP | Health & Safety Plan |
| ID | Ion dilution |
| IDW | Investigation derived waste |
| MS/MSD | Matrix spike / matrix spike duplicate |
| NAPL | Non-Aqueous Phase Liquid |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health |
| ORP | Oxidation Reduction Potential |
| PAHs | Polycyclic Aromatic Hydrocarbons |
| PCBs | Polychlorinated biphenyls |
| PFAS | Per- and Polyfluoroalkyl Substances |
| PID | Photo-ionization detector |
| PPE | Personal protective equipment |
| ppmv | Parts per million by volume |
| PVC | Polyvinyl chloride |
| RI | Remedial Investigation |
| RIR | Remedial Investigation Report |
| SCOs | Soil Cleanup Objectives |
| SDSs | Safety Data Sheets |
| SIM | Select ion monitoring |
| Site | Morgan Materials Hertel Warehouse |
| SVOCs | Semi-volatile organic compounds |
| TCL | Target Compound List |
| TestAmerica | TestAmerica Laboratories, Inc. |
| USEPA | United State Environmental Protection Agency |
| VOCs | Volatile organic compounds |
| $\mu g/m^3$ | Micrograms per cubic meter |

# 1 Introduction

Groundwater & Environmental Services, Inc. (GES) has prepared this workplan to describe the proposed remedial investigation activities to be conducted at Site No. 915210 – Morgan Materials Hertel Warehouse (the Site) located in Buffalo, New York. The purpose of this work is to characterize and delineate the contamination on-site and off-site both horizontally and vertically.

# 2 Site Description and Background

The Site is a part of the New York State Department of Environmental Conservation (NYSDEC) State Superfund Program and referred to as Site No. 915210. The Site is located at 373 Hertel Avenue in Buffalo, New York as shown on **Figure 1**.

## 2.1 Site Description

The Site is approximately 3.5 acres surrounded by a mixed use of residential and commercial properties and is located on the south side of Hertel Avenue near the intersection with Military Road. Properties immediately surrounding the Site include:

- North: Multiple residential homes and a commercial parking lot;
- South: CSX Transportation Rail Road;
- East: Commercial building near Hertel Avenue, mostly an undeveloped lot; and,
- West: CSX Transportation Rail Road.

The site mainly consists of two (2) warehouse buildings with a loading deck on the south side of the eastern building. The northern portion of the Site is primarily covered in concrete, where the former warehouse stood. The southern portion of the site is mostly undeveloped and covered in fill. A map showing the site and surrounded properties is included as **Figure 2**.

Geology at the site consists of sand and gravel fill to a depth ranging from approximately 10 to 24 feet (ft) below grade (bg) with the fill layer thickening towards the southeast. Below the fill material is red silty clay. It was reported that a perched water table exists within the fill material. Groundwater reportedly flow towards the south and southeast.

## 2.2 Site Background

Since 1963 the Site was used to store chemicals for resale by Morgan Materials. Prior to that the historic use of the Site is incomplete; however, records indicate The Jewell Steel & Malleable Co. was using the site for casting iron malleable materials from at least 1914 to 1923. A patent by the company indicated nickel and chromium were used in production.

In 1997, United State Environmental Protection Agency (USEPA), requested by NYSDEC, evaluated and removed approximately 20,000 drums from the warehouse. In 2003, a fire at the Site destroyed a large portion of the warehouse and cleanup activities were performed on all fire-related debris in the main part of the warehouse.

In 1999, an investigation of the site was conducted showing elevated levels of volatile organic compounds (VOCs), metals and poly aromatic hydrocarbons (PAHs) in soil.

In 2000, an investigation was conducted by Water Resource Associates for Morgan Materials in the loading deck area.

In 2001, a supplemental investigation was conducted by Malcolm Pirnie for Morgan Materials in fill material and groundwater. Groundwater had elevated concentrations of VOCs.

In 2013, a site characterization was conducted by AFI Environmental, Inc. for Morgan Materials and included the excavation of eight (8) test pits, sampling of sewer bedding, surface sampling and groundwater sampling. Noted exceedances were as follows:

- Surface soil – PAHs and manganese;
- Subsurface soil – VOCs, barium, copper, manganese and polychlorinated biphenyls (PCBs);
- Sewer bedding – no commercial soil cleanup objectives (SCOs) exceedances for VOCs;
- Groundwater (on-site) – VOCs, PAHs, iron and manganese; and,
- Groundwater (off-site) – VOCs.

### 2.2.1 NYSDEC Spill Incidents Database

One spill was located for the Site, details are listed below:

- Spill Date: September 13, 1996
- Spill No.: 9607597
- Material and Volume Spilled: Unknown quantity of Unknown Hazardous Material from abandoned drums
- Resource Affected: Soil
- Spill Closed Date: October 1, 1996

### 2.2.2 NYSDEC Bulk Storage Database Search

No results were found in the NYSDEC Bulk Storage Database for the Site.

## 3 Proposed Remedial Investigation Activities

Prior to mobilizing to the Site a reconnaissance visit was conducted to assess current site conditions as well as changes in major site features. Based on these observations and known site history the following proposed site activities were developed. Work is estimated to start in summer 2019.

## 3.1 Health and Safety

GES will prepare a site specific Health & Safety Plan (HASP). The HASP will include emergency contact information for the client and emergency services, hospital route and Safety Data Sheets (SDSs) for any chemicals that may be used or encountered during the work. If modifications or clarifications to the HASP are required to comply with 29 CFR 1910.120, these must be made before the start of field activities.

During the work, the GES site supervisor will be designated as the on-site Health & Safety officer for compliance with the HASP, as well as confirm that all field personnel are properly trained, medically fit, and have current certificates of training. It is currently assumed that Level D personal protective equipment (PPE) including at a minimum hard hat, safety glasses, nitrile gloves, and steel-toed boots. In addition, during decontamination procedures additional levels of PPE, such as Tychem® chemical suits and face shields, may be required to prevent exposure to contaminant of concern.

As per NSYDEC Division of Environmental Remediation-10 (DER-10) Appendix 1A New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP), all ground intrusive activities (soil/base excavation and handling, test pitting, trenching and install of soil borings/monitoring wells) shall have a real-time monitoring for VOCs and particulates along the perimeter of the area. Equipment will be calibrated at the beginning of each work day when ground intrusive activities are scheduled. Readings will be recorded every 15 minutes for particulate concentrations and for VOCs and checked every hour for exceedances unless conditions warrant more frequent checking, such as during high winds or a visual or audible alarm is observed.

Response levels and actions for CAMP are as follows:

- If VOCs downwind of work area exceeds 5 parts per million by volume (ppmv) above background for the 15-minute average work activities must be temporarily halted, when the VOC reading decreases below 5 ppmv work activities can resume. If levels remain elevated, the source of the vapors must be identified and corrective actions taken to abate emissions. If levels exceed 25 ppmv at the perimeter of the work area, activities must shutdown.
- If particulate concentrations downwind of the work area exceeds 100 micrograms per cubic meter (µg/$m^3$) greater than background for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Dust suppression techniques would include, but are not limited to, spraying soil with water, reducing traffic, reducing speed and using a binder on excavation walls and base. While using dust suppression techniques work may continue if particulate levels do not exceed 150 µg/$m^3$. If levels exceed 150 µg/$m^3$ above background, work must stop and a re-evaluation of activities initiated.

## 3.2 Utility Mark Out

At least three (3) business days prior to initiating subsurface work, Dig Safely New York will be contacted to provide a utility mark out and clearance for any nearby non-private utilities. In

addition, GES will utilize the approximate utility mark locations provided in previous investigation reports for the Site. Ground penetration locations may need to be adjusted or hand cleared based on the location of underground utilities.

## 3.3 Geophysical Survey

Prior to completing subsurface activities on-site, a geophysical survey will be completed. The geophysical survey will utilize ground penetrating radar with electromagnetic induction instruments (EM/GPR) to evaluate and identify potential subsurface utilities and structures. Based on this survey, some subsurface locations may be adjusted with the approval of NYSDEC.

## 3.4 Soil Borings and Monitoring Well Installation

Fifty-one (51) locations are proposed for soil borings. Locations are shown on **Figure 3**. Soil borings are to be completed after the geophysical survey.

GES site supervisor will oversee the advancement of the soil borings using direct-push method with a Geoprobe® rig to an approximate depth of at least twenty-four (24) ft bg or when native red silty clay is encountered. Samples for classification will be collected in approximately 2-foot intervals via macro-core sampling. Soil samples will be logged by the GES site supervisor for color, moisture content, grain size, olfactory and visual evidence of impacts following the modified Burmister method soil classification system. The samples will be placed in plastic bags and screened for organic vapors using a photo-ionization detector (PID) equipped with a 10.6 electron volt (eV) lamp and calibrated daily to one hundred (100) ppmv using isobutylene standard. Two (2) contaminants of concern, trichloroethene (TCE) and tetrachloroethene (PCE), can be measured using the 10.6 eV lamp due to the double covalent bonds in TCE and PCE resulting in a more volatile hydrocarbon. A flame ionization detector (FID) is not recommended for TCE and PCE due to the formation of hydrochloric acid (HCl) which will quickly corrode the FID electrode.

| Chemical Name | Ionization Potential (eV) |
|---|---|
| **Trichloroethene (TCE)** | 9.45 |
| **Tetrachloroethene (PCE)** | 9.32 |

Based on field observations, up to two (2) soil sample will be collected from each boring in laboratory-supplied bottleware, packed on ice and submitted to TestAmerica Laboratories, Inc. (TestAmerica) in Amherst, New York under chain of custody (CoC) for analysis of Target Compound List (TCL) VOCs via USEPA Method 8260C. Some select samples will also be analyzed for semi-volatile organic compounds (SVOCs) via USEPA Method 8270D, PCBs via USEPA method 8082A, pesticides via USEPA Method 8081B, total cyanide via USEPA Method 9012B, hexavalent chromium via USEPA Method 7196A, Target Analyte List (TAL) metals including mercury via USEPA Method 6010C/7471A, and emerging contaminants (ECs) Per- and Polyfluoroalkyl Substances (PFAS) via USEPA Method 537 Modified and 1,4-dioxane via USEPA Method 8270D Select Ion Monitoring (SIM) Isotope Dilution (ID), this complete list of analyses will

be referred to as Full Suite. All equipment will be PFAS-free and will follow NYSDEC guidance for EC sampling. These select samples will be chosen in the field based on observations and NYSDEC input, but up to twenty-two (22) samples will be collected. PFAS samples will be collected first and stored in a separate cooler to prevent cross-contamination. Additional samples may be collected for analysis based on field observations or requests by NYSDEC.

Upon completion of the soil borings, eleven (11) locations will be selected and converted to monitoring wells and installed using hollow-stem augers.

Total depth of the well may vary based on subsurface lithology, but in general each well will be installed to a depth of approximately twenty (20) to twenty-five (25) ft bg. Screen length will be based on field observations, but is designed to show groundwater conditions above the impermeable silty clay layer previously reported; therefore, screen will not extend into the clay layer. Monitoring wells will be installed with a 0.010-inch slotted polyvinyl chloride (PVC) screen. The well will be brought up to grade with a solid schedule 40 2-inch diameter PVC casing. The PVC screens will be backfilled to two (2) ft above top-of-screen with filter sand followed by at least two (2) ft of bentonite chips, the remaining backfill will be two (2) ft of grout followed by compacted stone up to grade. Based on the location of the wells, either a flush mounted road box or an approximately 3-foot tall riser will be installed for protection and each casing will be capped with a well plug. The road box or riser will be secured in place with a concrete pad roughly two (2) ft in diameter. A diagram of well construction is included on **Figure 4** and **Figure 5**.

The cutting shoe at the end of the Macro-Core® sampling sleeve will either be clean or decontaminated using an Alconox® wash followed by tap water rinse between uses. Between each sampling locations, all appropriate tools and equipment will be decontaminated using steam cleaning with a heated pressure washer followed by an Alconox® wash and potable water rinse. Water from decontamination will be collected in decontamination pad and pumped into a tote or drum for on-site storage until disposal.

Upon completion of each soil boring location, a stake or flag will be installed to mark the location for post-remedial investigation surveying. Boreholes not converted to monitoring wells will be restored according to DER-10 Section 3.3(e)1. Areas of concrete or asphalt will be restored at completion of remedial investigation.

## 3.5 Surface Soil Sampling

Surface soil samples from zero (0) to two (2) inches below vegetation will be collected from various locations across the Site. Samples will be analyzed for the Full Suite of analyses previously listed (except VOCs). PFAS samples will be collected first and stored in a separate cooler to prevent cross-contamination. Samples will be placed in laboratory-supplied bottleware, stored on ice, and delivered under CoC to TestAmerica for analysis. Analyses are listed in **Table 1**. Each surface sample location will be marked with either a stake or flag to be surveyed after the remedial investigation is complete.

In addition, there is a soil pile in the northwest portion of the Site. It is believed that the soil originated from test pits that were excavated on-site, but this could not be confirmed. Two (2) samples will be collected from the pile that is estimated to be between 400 and 500 cubic yards

and will be analyzed for VOCs and the Full Suite. Analytical results and NYSDEC guidance will determine the final disposition of the soil pile.

## 3.6 Test Trenching

Test trenches to be completed after EM/GPR survey. Trenches will be completed as shown on the **Figure 3**, except that areas of concrete/asphalt will not be disturbed. Trenches will be sampled approximately every fifty (50) linear ft, with one (1) sample being collected from trenches less than 50 ft in length. Final sample locations will be based on visual, olfactory, and PID observations. All excavated material will be staged on plastic sheeting adjacent to the trench. Excavated soil may be backfilled into the trench according to DER-10 Section 3.3(e)4. Trench profiles will be generated to show the soil stratigraphy. Trenches will be logged by GES site supervisor for color, moisture content, grain size, olfactory and visual evidence of impacts following the modified Burmister method soil classification system. Trenches will not be left open at the end of the work day, unless instructed to by NYSDEC. Trenches will be completed to thirteen (13) to fifteen (15) ft bg. If evidence of contamination is present beyond the reach of the excavator additional investigation (i.e. soil borings) may be necessary. Analyses are listed in **Table 1**

Samples will be analyzed for TCL list VOCs via USEPA Method 8260C. Some samples will be analyzed for the Full Suite of analyses. PFAS samples will be collected first and stored in a separate cooler to prevent cross-contamination. Samples will be placed in laboratory-supplied bottleware, stored on ice, and delivered under CoC to TestAmerica for analysis. Each trench will be marked with stakes or flags to be surveyed after the remedial investigation is complete. Analyses are listed in **Table 1**

## 3.7 Groundwater Well Development

At least twenty-four (24) hours after installation of the monitoring wells, the wells will be developed to facilitate hydraulic communication between the formation and the well screen. Any existing monitoring wells with sediment buildup will be developed as well.

The wells will be developed via mechanical surging method using a surge block device. The surge block can be used effectively to destroy the bridging of the fine formation particles and to create the agitation that is necessary to develop the well. The surge block technique will be used with pumping to remove material that has been agitated and loosened by the surging. Each well will record field parameters (Temperature, pH, Oxidation/Reduction Potential [ORP], specific conductivity, dissolved oxygen [DO] and turbidity) during development. Surging and pumping will be conducted until either water clarity has improved or until the wells cannot sustain further pumping. All equipment and materials will be PFAS-free. A period of time at least one (1) week will elapse between well development and sampling.

## 3.8 Groundwater Well Sampling

At least one round of groundwater sampling will be conducted at the Site following procedures outlined in the USEPA *Low Stress (low flow) Purging and Sampling Procedure for the Collection*

*of Groundwater Samples from Monitoring Wells* revised September 19, 2017. All new and existing monitoring wells will be sampled during the event. GES personnel will gauge the monitoring wells for water level. The wells will be low flow purged with a peristaltic pump and dedicated polyethylene tubing. Each well will be purged until field parameters (Temperature, pH, ORP, specific conductivity, DO and turbidity) stabilize or the well goes dry. Upon stabilization or recovery from partial dewatering a sample can be collected for TCL VOCs via USEPA Method 8260C. Select samples will be analyzed for the Full Suite of analyses. PFAS samples will be collected first and stored in a separate cooler to prevent cross-contamination and all sampling materials and equipment will be PFAS-free. Samples will be placed in laboratory-supplied bottleware, stored on ice, and delivered under CoC to TestAmerica for analysis. The list of analyses and number of samples is summarized on **Table 1**.

## 3.9 Surveying

Upon completion of all field activities a site survey will be conducted to record investigation activities on a to-scale site base map, update existing site features, add topography and well/sample locations.

## 3.10 Quality Assurance/Quality Control (QA/QC)

Care will be taken during all aspects of the sample collection to ensure that high quality data is obtained. At least every twenty (20) samples, for each media, one (1) duplicate sample and one (1) matrix spike / matrix spike duplicate (MS/MSD) sample will be collected and submitted for analysis for quality assurance of both the sample collection procedure and the laboratory method. All samples will be submitted via courier to the necessary laboratories for analysis under proper CoC. At the end of each day that PFAS sample was collected, one (1) equipment blank sample will be collected and analyzed for PFAS to verify decontamination procedures. Each cooler with VOC samples will contain a trip blank and will be analyzed for TCL VOCs. A summary of QA/QC sample quantities and analyses is included in **Table 1**.

GES will subcontract a third party data validator to prepare a Data Usability Summary Report (DUSR) in accordance with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation.

## 3.11 Waste Disposal

### 3.11.1 Soil/Solids Investigation Derived Waste (IDW)

Soil cuttings from soil boring, well installation and trenching activities will be placed on poly sheeting and stored on-site with correct identification and contact information. Prior to disposal, the waste will be sampled for characterization and profiled for off-site disposal at an NYSDEC approved waste disposal facility. Representative samples may be collected from each waste stream for laboratory analysis in accordance with the disposal facility. A summary of analyses is included in **Table 1**.

Excess soil cuttings from off-site locations will be transported on-site and stored and the end of each working day using the same standards as on-site soil.

### 3.11.2 Decontamination/Purge Water IDW

Decontamination water will be staged on-site in a 275-gallon tote or 55-gallon drum with correct identification and contact information. The waste water will be sampled for characterization and may either be treated and discharged on-site or profiled for off-site disposal at an NYSDEC approved waste disposal facility. NYSDEC will determine disposal after analytical results are reported. A summary of analyses is included in **Table 1**.

Groundwater and purge water will be staged on-site in a 275-gallon tote or 55-gallon drum with correct identification and contact information. The waste water will be sampled for characterization and may either be treated and discharged on-site or profiled for off-site disposal at an NYSDEC approved waste disposal facility. NYSDEC will determine disposal after analytical results are reported. A summary of analyses is included in **Table 1**.

# 4 Reporting Activities

## 4.1 Data Validation

Category B deliverables will be obtained from TestAmerica and submitted to a third party data validator along with any supporting documents (bore logs, groundwater sampling logs, field notes, etc.) for validation and a DUSR. Any amended qualifying flags or rejected data will be updated prior to completing the summary report and electronic data submission.

## 4.2 Summary Report

GES will prepare a report, the remedial investigation report (RIR) shall include the following items and will be prepared in general accordance with NYSDEC DER-10 guidelines.

The RIR incorporates the information collected by the investigations conducted pursuant to this approved Remedial Investigation (RI) workplan. Where the RI was conducted in several phases, the RIR is to be a comprehensive report of all data collected during the RI and the conclusions drawn from that data.

The following sections should be included in the RIR:

- Identify and characterize the source(s) of contamination.
- Describe the amount, concentration, environmental fate and transport, including as necessary, phase (e.g., gas, solid, liquid), location, and other significant characteristics of the contaminant(s) present.
- Define hydrogeological factors, as needed, to include: grain size analysis, soil permeability, nature of any bedrock, depth to saturated zone, hydraulic gradients, depth to bedrock, bedrock permeability, proximity to a drinking water aquifer, surface water, floodplains and wetlands.

- Provide a qualitative human exposure assessment.
- Stratigraphic logs which include soil/rock physical descriptions, well installation details, well development data including volumes purged, and field instrument readings detected during drilling for each soil boring, test pit and monitoring well. This data, where available, for any public/private drinking water wells in the area of groundwater impact will also be included.
- Stratigraphic cross sections of the site will be developed using information from monitoring wells, test pits, borings, geophysical data, or other historical information.
- Site and area of concern base maps.
- Sample location maps, appropriate to the area of the site and consistently used, with the sample points located by a surveyor or by Global Positioning System (GPS) to include all groundwater, soil, sediments and other sample locations with sample depth and contaminant concentrations indicated on the map, if possible.
- Groundwater elevation contour maps with flow direction specified for each set of static water level measurements for each aquifer where monitoring wells/piezometers were installed for flow direction. Groundwater elevation, for each monitoring well/piezometer, must be to the nearest hundredth (0.01) foot relative to a permanent, on-site datum.
- Top of bedrock contour or low-permeability unit map if bedrock or the unit was encountered in a sufficient number of borings to prepare a map.
- At a minimum, site maps should show groundwater contaminant concentrations for each sampling round. Isopleth maps for groundwater contaminant concentrations for each round of sampling and isopleth maps for soil sample results should also be provided.
- Maps depicting the areal and vertical (thickness) extent of any Non-aqueous phase liquid (NAPL) zones in groundwater or soil.
- Any data collected to develop discharge limitations.
- Any other pertinent data obtained from implementing the workplan, including any IRMs done prior to or during the RI.
- A qualitative human health exposure assessment, which identifies areas of concern and chemicals of concern, evaluates actual or potential exposure pathways, characterizes the potentially exposed receptors (residents, workers, recreational users, etc.), and identifies how any unacceptable exposures might be eliminated/mitigated. An exposure assessment should identify:
    - exposure pathways, which is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are the: (1) source of contamination; (2) environmental media and transport mechanisms; (3) point of exposure; (4) route of exposure; and (5) receptor population;

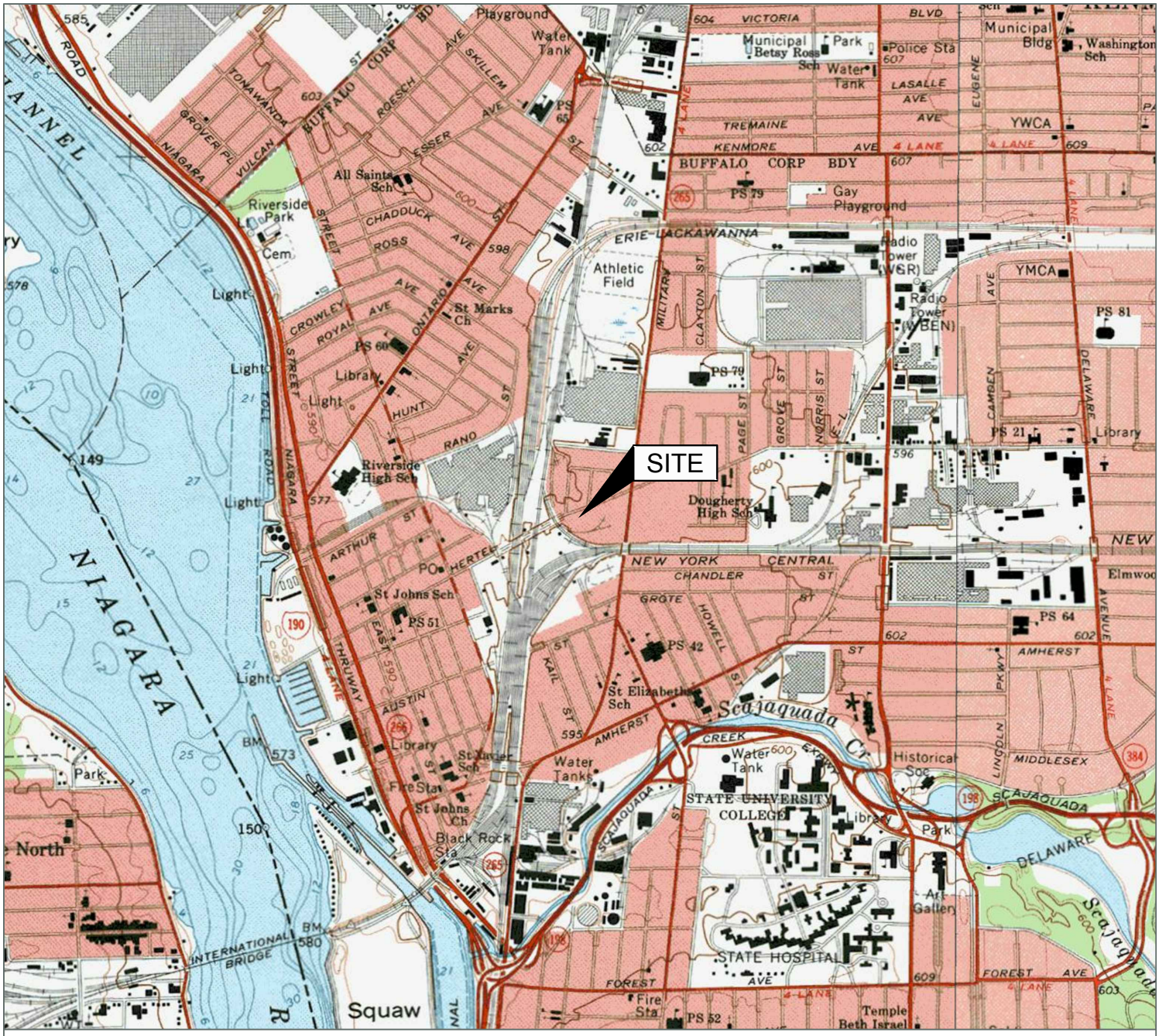
- the elements of an exposure pathway identified will be based on past, present or future events; and
- the potentially exposed receptors and how any unacceptable exposures may be eliminated will be determined from an assessment of the primary use of the area (e.g., residential, industrial, or recreational), actual and potential use of ground and surface waters that are impacted or threatened, and how any potential routes of exposure may be eliminated.

- Conclusions and recommendations which summarize the extent of the areas of concern, identifies any unacceptable exposure pathways, and recommends any future work (e.g., none, additional investigation, or an evaluation of remedial alternatives). This will include an updated conceptual model of the site and may also include remedial action objectives, if requested by NYSDEC.
- All required reports and/or documentation identified by this section must be provided in an electronic format.

## 4.3 Electronic Data Submission

GES will prepare the NYSDEC EQuIS electronic data deliverables (EDDs) after the DUSR is completed and submit all data files from the remedial investigation activities to NYSDEC Environmental Information Management System (EIMS) for upload to NYSDEC EQuIS Database.

# Figures

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Buffalo NW, New York
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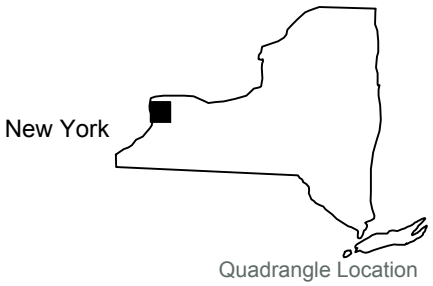


Quadrangle Location

Site Location Map

NYSDEC
Hertel Warehouse NYSDEC #915210
373 Hertel Avenue
Buffalo, New York

Drawn
W.G.S.
Designed
J.K.C.
Approved
E.P.

Date
6/13/19
Figure
1

N

Scale In Feet
0 2000

Groundwater & Environmental Services, Inc.

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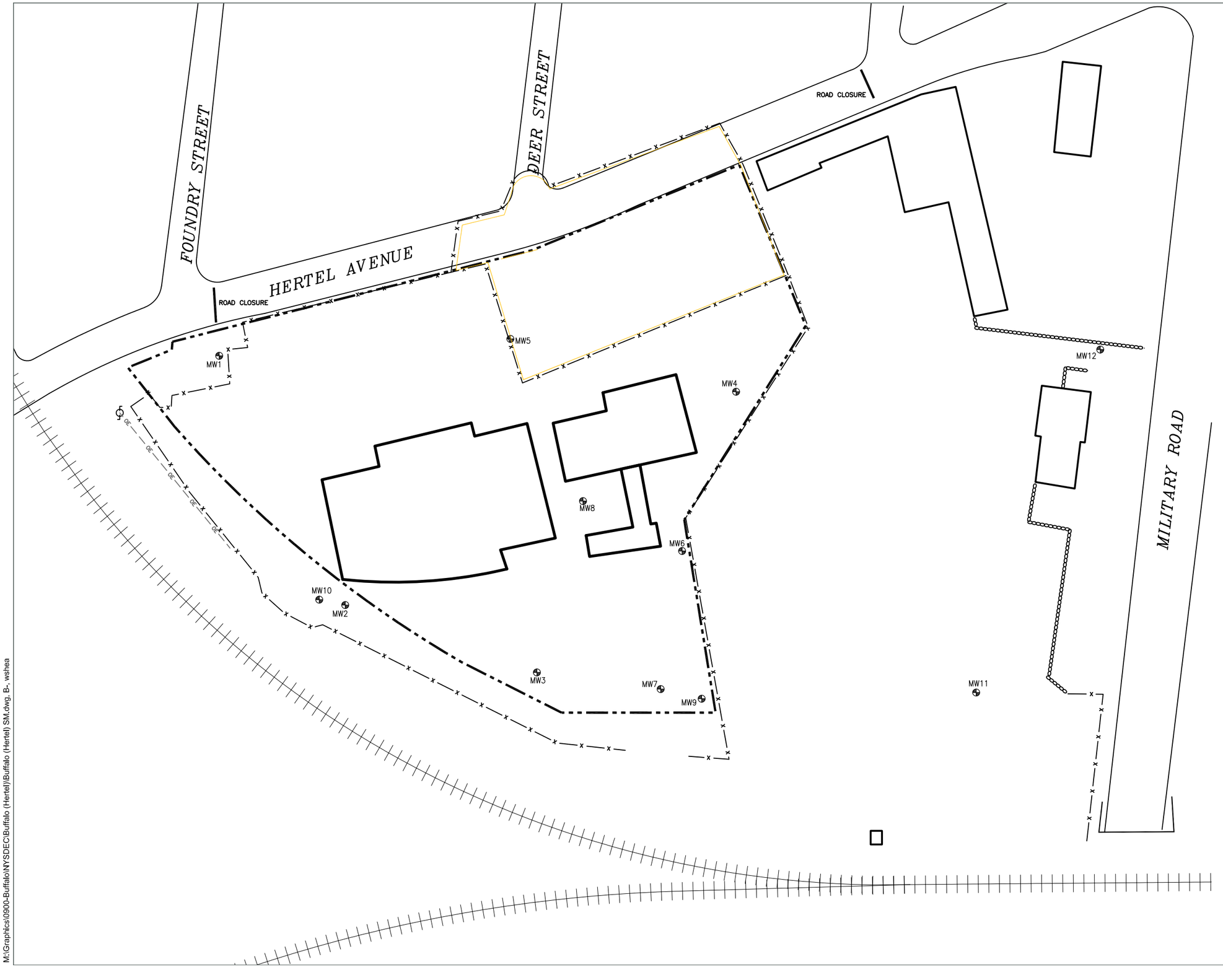


Site Map

NYSDEC #915210
Morgan Materials Hertel Warehouse
373 Hertel Avenue
Buffalo, New York

Drawn
W.G.S.
Designed
J.K.C.
Approved
E.P.

Date
6/13/19
Figure
2

Scale In Feet
0 60

Groundwater & Environmental Services, Inc.

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FOUNDRY STREET

DEER STREET

HERTEL AVENUE

ROAD CLOSURE

ROAD CLOSURE

MILITARY ROAD

BSA EXCAVATION

SOIL PILE

GP1 GP2 GP3 GP4 GP5 GP6 GP7 GP8 GP9 GP10 GP11 GP12 GP13 GP14 GP15 GP16 GP17

MW1 MW2 MW3 MW4 MW5 MW6 MW7 MW8 MW9 MW10 MW11 MW12

SS1 SS2 SS3

TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9

OE

## LEGEND

- PROPERTY BOUNDARY
- FENCE
- RAILROAD LINE
- WALL
- UTILITY POLE
- MONITORING WELL
- OVERHEAD ELECTRIC LINE
- BSA CONSTRUCTION AREA
- TEST PIT
- SURFACE SOIL SAMPLE
- SOIL BORING
- UNKNOWN SURFACE SPILL
- PROPOSED MONITORING WELL
- PROPOSED SOIL BORING
- PROPOSED TEST TRENCH

Proposed Remedial Investigation Locations

NYSDEC #915210
Morgan Materials Hertel Warehouse
373 Hertel Avenue
Buffalo, New York

Drawn
W.G.S.
Designed
J.K.C.
Approved
E.P.

Date
6/13/19
Figure
3

N

Scale In Feet
0 60

GES
Groundwater & Environmental Services, Inc.

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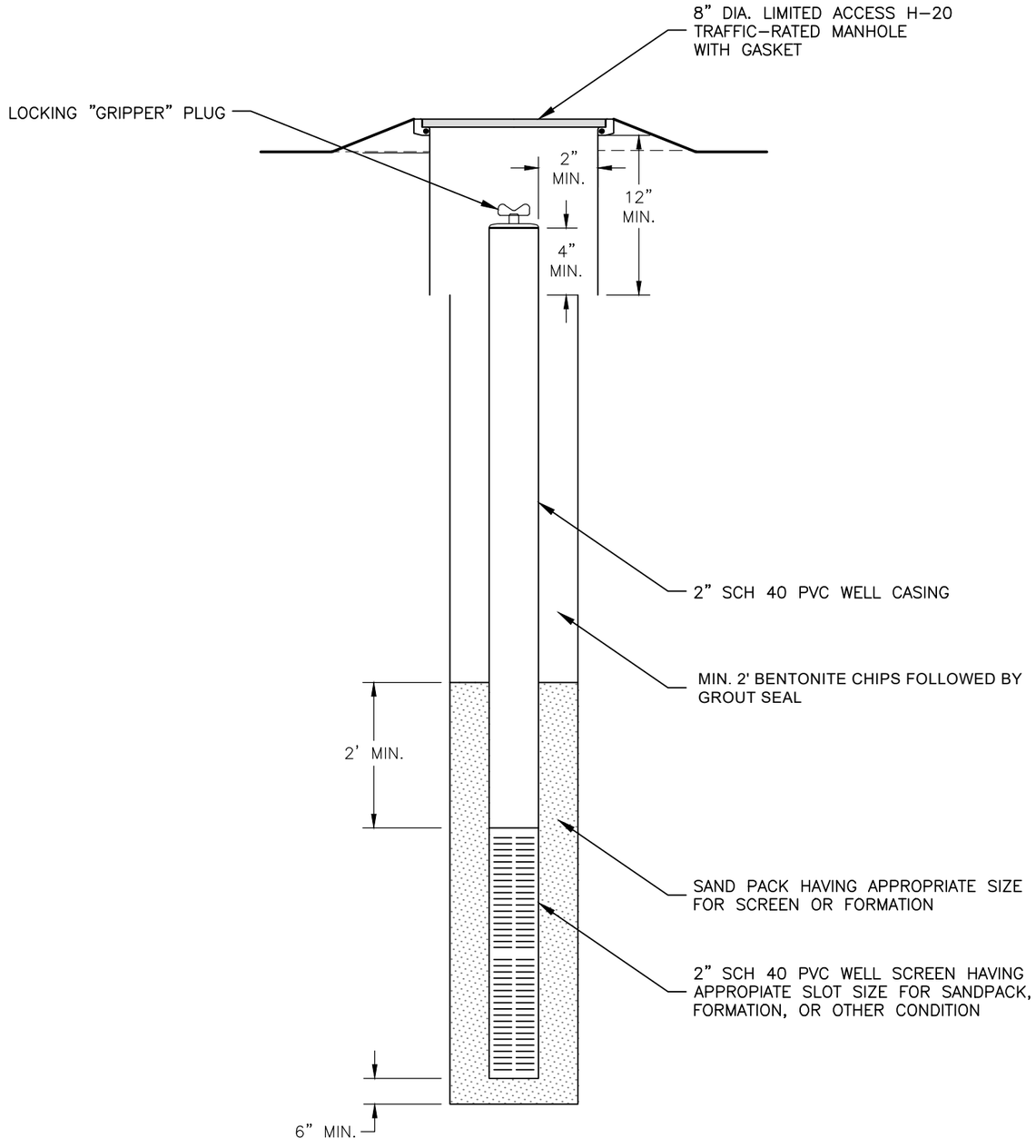


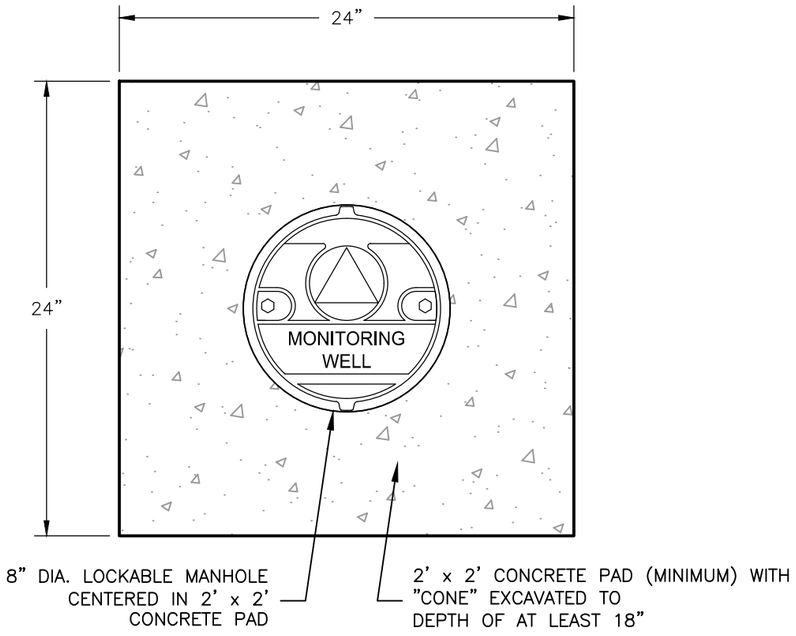


Typical Construction
2-Inch Monitoring Well Flush Mount

NYSDEC MORGAN MATERIALS
HERTEL WAREHOUSE
373 HERTEL AVENUE
BUFFALO, NEW YORK 14207

Drawn
E.V.
Designed
R.K.E.
Approved
R.K.E.

Date
06/07/18
Figure
4

Not to Scale

GES
Groundwater & Environmental Services, Inc.

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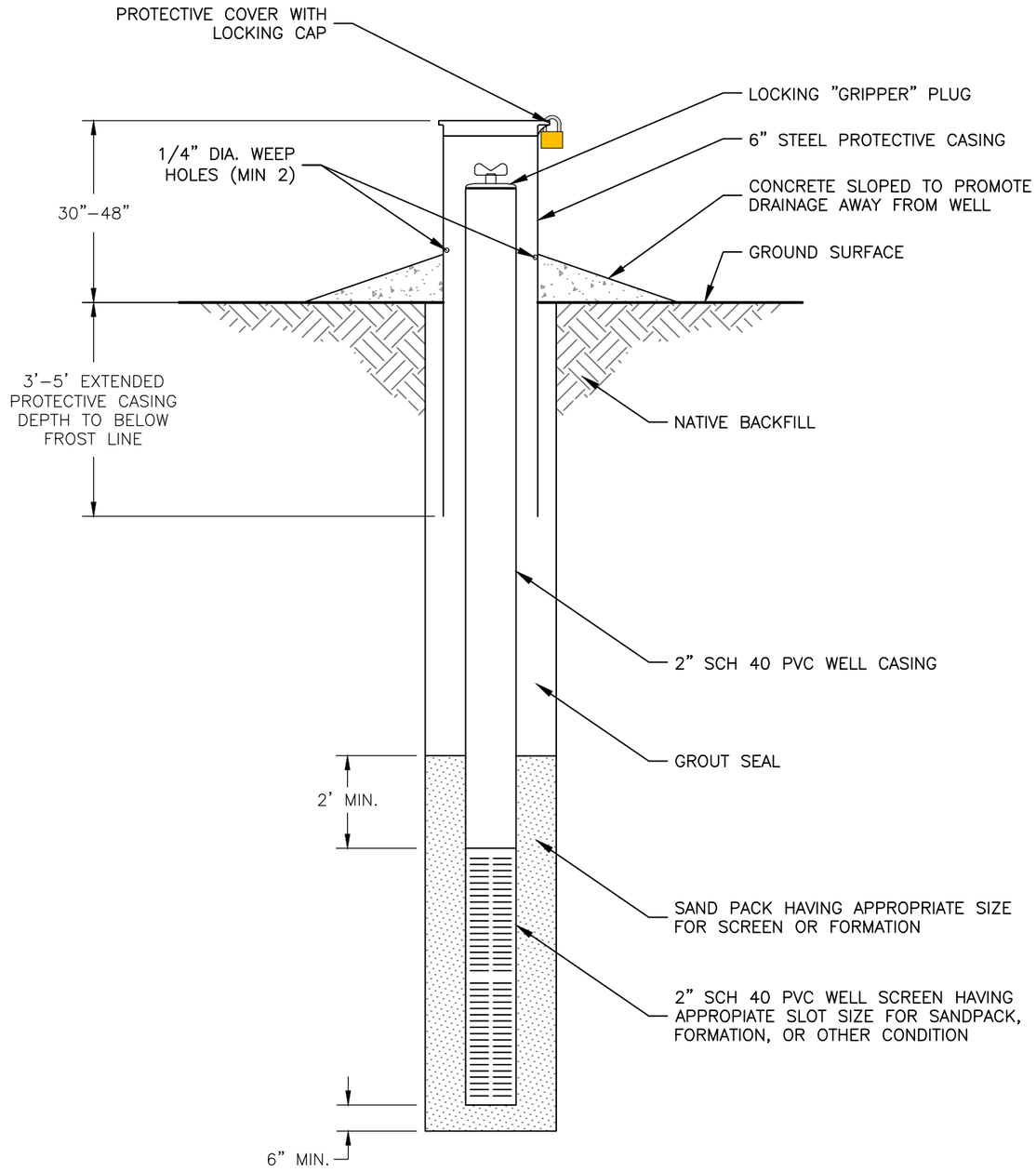


Typical Construction
2-Inch Monitoring Well Stick-Up

NYSDEC MORGAN MATERIALS
HERTEL WAREHOUSE
373 HERTEL AVENUE
BUFFALO, NEW YORK 14207

Drawn
E.V.
Designed
R.K.E.
Approved
R.K.E.

Date
06/07/18
Figure
5

Not to Scale

Groundwater & Environmental Services, Inc.

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# Table

**Table 1**
**Proposed Sample Matrix**

| Sample Media | Sample Type | Purpose | QA/QC Samples | Estimated Quantity | Analysis | Method |
|---|---|---|---|---|---|---|
| Surface Soil - Fill Material | Grab | Characterization of any surface impacts. One sample from the surface material (0"-2" below vegetation) from various points around the Site. | QA/QC Samples will be collected from Soil Boring Samples | 8 | TCL SVOCs | 8270D |
| | | | | | PCBs | 8082A |
| | | | | | Pesticides | 8081B |
| | | | | | Total Cyanide | 9012B |
| | | | | | Hexavalent Chromium | 7196A |
| | | | | | TAL Metals | 6010C/ 7471B |
| | | | | | PFAS | 537 Mod |
| | | | | | 1,4-Dioxane | 8270D SIM ID |
| Surface Soil - Soil Piles | Grab | Characterization of soil pile impacts. Two samples from the soil pile material. | QA/QC Samples will be collected from Soil Boring Samples | 2 | TCL VOCs | 8260C |
| | | | | | TCL SVOCs | 8270D |
| | | | | | PCBs | 8082A |
| | | | | | Pesticides | 8081B |
| | | | | | Total Cyanide | 9012B |
| | | | | | Hexavalent Chromium | 7196A |
| | | | | | TAL Metals | 6010C/ 7471B |
| | | | | | PFAS | 537 Mod |
| | | | | | 1,4-Dioxane | 8270D SIM ID |
| Soil Borings | Grab | Characterization of any subsurface impacts. One sample from each soil boring, however some borings may warrant a second sample at different depths. | 4 Duplicate & 4 MS/MSD | 80 | TCL VOCs | 8260C |
| | | | 2 Duplicate & 2 MS/MSD | 22 | TCL VOCs | 8260C |
| | | | | | TCL SVOCs | 8270D |
| | | | | | PCBs | 8082A |
| | | | | | Pesticides | 8081B |
| | | | | | Total Cyanide | 9012B |
| | | | | | Hexavalent Chromium | 7196A |
| | | | | | TAL Metals | 6010C/ 7471B |
| | | | | | PFAS | 537 Mod |
| | | | | | 1,4-Dioxane | 8270D SIM ID |
| Trenching | Grab | Characterization of any subsurface impacts. One sample every 50 linear feet. | 1 Duplicate & 1 MS/MSD | 17 | TCL VOCs | 8260C |
| | | | QA/QC Samples will be collected from Soil Boring Samples | 5 | TCL VOCs | 8260C |
| | | | | | TCL SVOCs | 8270D |
| | | | | | PCBs | 8082A |
| | | | | | Pesticides | 8081B |
| | | | | | Total Cyanide | 9012B |
| | | | | | Hexavalent Chromium | 7196A |
| | | | | | TAL Metals | 6010C/ 7471B |
| | | | | | PFAS | 537 Mod |
| | | | | | 1,4-Dioxane | 8270D SIM ID |

**Table 1**
**Proposed Sample Matrix**

| Sample Media | Sample Type | Purpose | QA/QC Samples | Estimated Quantity | Analysis | Method |
|---|---|---|---|---|---|---|
| Groundwater | Grab | Collect groundwater samples from existing and newley installed monitoring wells to evaluate current impacts groundwater on-site and off-site. | 2 Duplicate & 2 MS/MSD | 38 | TCL VOCs | 8260C |
| | | | 1 Duplicate & 1 MS/MSD | 6 | TCL VOCs | 8260C |
| | | | | | TCL SVOCs | 8270D |
| | | | | | PCBs | 8082A |
| | | | | | Pesticides | 8081B |
| | | | | | Total Cyanide | 9012B |
| | | | | | Hexavalent Chromium | 7196A |
| | | | | | TAL Metals | 6010C/ 7471B |
| | | | | | PFAS | 537 Mod |
| | | | | | 1,4-Dioxane | 8270D SIM ID |
| NA | Lab Supplied | Trip Blank | 1 per cooler | NA | TCL VOCs | 8260C |
| PFAS Free Water | Lab Supplied | Equipment Blank | 1 per PFAS GWS day | NA | PFAS | 537 Mod |
| Soil cuttings and Soilds | Composite | Waste Characterization and possible landfill disposal profiling - final listing may depend on disposal facility | NA | 1 | pH | TBD |
| | | | | | Igitability | |
| | | | | | Total Petroleum Hydrocarbons | |
| | | | | | PCBs | |
| | | | | | TCLP RCRA-8 Metals | |
| | | | | | TCLP Volatiles | |
| | | | | | TCLP Semi-Volatiles | |
| | | | | | Reactive Cyanice & Sulfide | |
| | | | | | Total Pesticides | |
| | | | | | Total Herbicides | |
| Decontamination and Purge Water for disposal | Composite | Waste Characterization and possible landfill disposal profiling - final listing may depend on disposal facility | NA | 2 | pH | TBD |
| | | | | | Igitability | |
| | | | | | Total Petroleum Hydrocarbons | |
| | | | | | PCBs | |
| | | | | | TCLP RCRA-8 Metals | |
| | | | | | TCLP VOCs | |
| | | | | | TCLP SVOCs | |
| | | | | | Reactive Cyanice & Sulfide | |
| | | | | | Total Pesticides | |
| | | | | | Total Herbicides | |

Notes:
QA/QC = Quality assurance/quality control
MS/MSD = Matrix spike/matrix spike duplicate
TCL = Target compound list
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
PCBs = Polychlorinated biphenyls
TAL = Target analyte list
PFAS = Per- & Polyfluoroalkyl substances
GWS = Groundwater sampling
TCLP = Toxicity characteristic leaching procedure
RCRA = Resource Conservation and Recovery Act