REMEDIAL INVESTIGATION –
ALTERNATIVES ANALYSIS REPORT WORK PLAN

BROWNFIELD CLEANUP PROGRAM
For
140 Chandler Street, LLC
Western Portion of 140 Chandler Street Site, 140 Chandler Street, Buffalo, New York 14207
BCP # C915354

Prepared For:
140 Chandler Street, LLC
391 Washington Street, Buffalo, New York 14203
WGS Project No: 19211

Prepared By:
Wittman GeoSciences, PLLC
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January 9, 2020 rev May 15, 2020

WITTMAN
GeoSciences, PLLC

CERTIFICATIONI, Michele M. Wittman, P.G., certify that I am currently a NYS registered professional geologist and that this Remedial Investigation Work Plan was prepared in accordance with applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Michele M. Wittman, P.G.
Wittman GeoSciences, PLLC
New York License Number 000726

05/15/2020
Date

WITTMAN
GeoSciences, PLLC

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1.0 INTRODUCTION

1.1 Project Background

This Remedial Investigation (RI) Work Plan presents the proposed scope of work (Work Plan) at the 140 Chandler Street Site located at 140 Chandler Street located in the City of Buffalo, New York (Site), as shown on Figure 1 and Figure 2. The Applicant, 140 Chandler Street, LLC, has submitted an application into the Brownfield Cleanup Program (BCP) as a Volunteer, identified as Site Number C915354. The 140 Chandler Street Site is in the process of being divided into two parcels, including Western Portion, identified as SBL #77.84-4-4.1; and Eastern Portion, identified as SBL #77.84-4-4.42. This RI WP will address work for the Western Portion of 140 Chandler Street Site (Western Portion) only.

The RI will be completed by Wittman GeoSciences, PLLC (WGS) on behalf of 140 Chandler Street, LLC. The work will be completed in general accordance with New York State Department of Environmental Conservation (NYSDEC) DER-10 guidelines. The work plan provides details on the Site investigation to be undertaken. The Site investigation will include subsurface conditions throughout the Site. Site development will be completed concurrently with remedial investigation work, and areas of concern, if identified, will be addressed as needed. NYSDEC will be notified of any remedial work, if any, completed during Site development activities.

1.2 Site Background

The Site is addressed as Western Portion of 140 Chandler Street in the City of Buffalo, Erie County, New York and consists of one parcel totaling approximately 0.5 acres of land. The Site is bound to the north by railroad tracks, to the south by Chandler Street, to the west by commercial operator (J&D's Seal Tech), and to the east by vacant land, a commercial structure, with occupants including Tappo Restaurant, Thin Man Brewery, ODL Ortho Lab, and a salon and fitness center The property is located within an urban area, utilized for industrial, commercial, and residential purposes.

The Site contains three buildings. Building 1 includes approximately 2,500 square foot one-story concrete block building. Building 2 is an approximate 1,000-sqaure foot one-story concrete block building. Building 3 is a two story, approximate 1,500 square foot building with tranSite walls and roofing. Building 3 was formerly utilized as a compounding building, containing six ASTs of various sizes that currently remain on-Site. Building 2 and 3 are planned for cleanout and demolition.

The western portion of the Site was originally constructed in 1911 by Faramel Manufacturing Company, a feed mill manufacturing company, and included several buildings. By 1940, the western portion was inhabited by EJ Woodison company, a plating manufacturing facility, occupied from at least 1964 to 1980. The central and eastern portion of the Site was constructed in 1914 by Enterprise Oil company, a soap and compounds of lubricating oils manufacturing company. Building 3, was formerly a compounding building, utilized for the mixing of various oils and/or lubricants. The feed mill buildings were demolished in the 1950s, and current Buildings 1 and 2 were constructed in 1965 and used by Quaker State Oil Refining Company until about 1989.

Since that time, various companies occupied the buildings including Cream of Peas Company, Inc., Quaker State Oil Refining Corporation, EJ Woodison Co., Quality Petroleum Products, Inc., LASCO, Inc., and Niagara Lubricants. Over fifty-eight (58) known storage tanks, both located underground and aboveground, were historically located at the Site since at 1933, with the most recent tank closure in 2005. The building addressed as 160-164 Chandler Street, which occupied the entire eastern half of the Site, was most recently occupied by Niagara Lubricants and was destroyed by a fire in the summer of 2011. Following building demolition associated with the fire, the various tanks were removed, and the former building area was backfilled. The Site has been vacant since that time.

1.3 Summary of Environmental Conditions

During due diligence work prior to property purchase, Hazard Evaluations Inc. completed a limited Phase II investigation for Signature Development at the property in May 2019. The work included completion of 16 soil borings, three test pits and collection of soil and groundwater samples, at locations shown on Figure 3. Soil boring locations SB9 to SB16, as well as TP1 and TP3 were completed on the Western Portion. Based on this limited investigation, the primary contaminants of concern in the soil/fill profile include semi-volatile organic compounds (SVOCs), and metals. Appendix A includes the sample location figure, tables summarizing analytical data and soil boring logs from the May 2019 investigation. A final report was not created for the Phase II work.

The Phase II testing identified SVOCs throughout various areas of the Site at concentrations exceeding restricted residential, commercial, and industrial standards.

1.4 Site Conditions

Based on the soil borings completed, approximately 4 to 7 feet of granular and cohesive fill material is present throughout the Site. Clay and silt was encountered below the fill material and extended the full depth drilled, ranging from 8 to 12 feet below grade. Groundwater was encountered approximately 3.5 to 5 feet below grade.

The Site is generally flat, with the surface covered by buildings or gravel areas. A pile of debris/gravel/soil is present in the northeastern corner of the Site. Based on a review of the Site topographic conditions as depicted on the USGS 7.5-minute Topographic Quadrangle Map of Buffalo NW, New York, shallow regional groundwater flows is expected to flow in a southwesterly direction toward Scajaquada Creek located approximately 0.4 miles south and toward the Niagara River located approximately one mile west of the Site.

The Site does not have state or federal wetlands within property limits, nor is the Site located within a flood plan. Figure 4, obtained from the Erie County GIS On-line Mapping System, depicts nearby wetlands and/or floodplains which include the floodplain along Scajaquada Creek, located approximately 0.5 miles south of the Site.

The Site is currently serviced by municipal utilities, including potable water, sanitary and storm sewers from the City of Buffalo, natural gas and electric. There are no known groundwater supply wells on-Site and the surrounding area is serviced with potable water.

2.0 PROJECT OBJECTIVES

The Site has not been comprehensively characterized; therefore, the Applicant intends to further investigate the soil/fill and groundwater (if encountered) at the Site. Data collected during the RI will be used to identify potential health risks and to evaluate remedial alternatives. The objectives of the RI include the following:

- Define the nature and extent of on-Site contamination in both soil and groundwater.
- Identify on-Site source areas of contamination, if any.
- Collect data of sufficient quantity and quality to evaluate potential threats to the public health and environment.
- Collect data of sufficient quantity and quality to evaluate remedial alternatives.
- Soil vapor intrusion (SVI) assessment will be completed within Building 1, which will remain in place.

2.1 Regulatory Criteria

NYSDEC has applicable standards, criteria and guidance (SCG) values that will be used for this project. These goals are applicable when considering remedial alternatives. For purposes of the RI, the following SCG will be utilized:

- 6 NYCRR Part 375-3 Brownfield Cleanup Program dated December 14, 2006.
- NYSDEC Policy CP-51/Soil Cleanup Guidance dated October 21, 2010.
- NYSDEC "DER-10 Technical guidance for Investigation and Remediation", dated May 2010.
- NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) document "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" dated June 1998, amended January 1999 Errata Sheet, April 2000 Addendum and June 2004 Addendum.
- New York State Department of Health (NYSDOH) "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006.

In addition, sampling data will be used to evaluate remedial alternatives to meet the objectives identified above. Two data confidence levels will be considered, including field screening data and analytical level data. Field screening will include photoionization detector (PID), groundwater elevation measurement, and field groundwater analyses (pH, temperature, specific conductivity, turbidity). Analytical level data will be associated with select soil and groundwater samples submitted for chemical analysis to an independent laboratory.

Soil and groundwater samples will be collected in general accordance with NYSDEC and U.S. Environmental Protection Agency (USEPA) sample collection and handling methodologies. Samples selected for laboratory analysis will be submitted to a NYSDOH Environmental Laboratory Accreditation Program (ELAP) Contract Laboratory Protocol (CLP) certified laboratory, with a Category B deliverables package. Additionally, a Data Usability Summary Report (DUSR) will be prepared by a third-party data validator.

2.2 Project Organization

WGS will establish a project team for successful completion of the project. The project team has not been finalized and subcontractors will be determined. Once the team has been finalized, appropriate resumes and information will be provided to NYSDEC. The anticipated project team is listed below:

Company	Name	Role
140 Chandler Street LLC	Rocco Termini	Applicant and Property Owner
Wittman GeoSciences, PLLC	Michele Wittman	Project Director
Schenne & Associates	John Schenne, PE	Project Engineer
Hazard Evaluations	Mark Hanna, CHMM	Environmental Health & Safety Manager
Hazard Evaluations	Eric Betzold	Project Scientist/Site Safety Officer
Alpha Analytical	Candace Fox	Analytical Laboratory
TBD	TBD	Geoprobe/Drilling Contractor
Lazarus Industries, LLC	Frank Lazarus	Excavation Contractor
Vali-Data of WNY	Jodi Zimmerman	Data Usability Summary Report

Michele Wittman – Michele will be the Project Director for the work and will be responsible for completion of each task, including coordination and supervision of field activities, adherence to work plan, schedule and budget. Additionally, Michele will be responsible for development of the work plan, coordination of subcontractors, field project oversight and report preparations.

3.0 INVESTIGATION SCOPE OF WORK

3.1 Introduction

The proposed RI scope of work will include investigation for potential Site contaminants in the soil/fill. groundwater, and soil vapor at the Site. The scope of work includes 17 test pits, 12 soil boring locations, five of which will be converted to monitoring wells, and one vapor intrusion sample location. Proposed sampling locations are included on Figure 5 and summary of proposed analytical testing is presented on Table 1.

3.2 Site Preparation

Prior to implementation of RI activities, the following Site preparation work will be completed.

General Site Cleanup and Debris Removal – Various debris and garbage is located throughout the surface of the Site. This material will be collected and disposed off-Site as solid waste. Attachment A contains photographs of debris on-Site.

Building Asbestos Abatement - A Pre-Renovation/Demolition Asbestos Inspection Report was completed by AMD Environmental Consultants, Inc., and included as Attachment B. Asbestos was identified in each of the Site buildings, including floor tile, tranSite stack, roofing materials,

thermal system insulation, tank insulation, tranSite and window glaze. The asbestos will be removed from the three Site buildings.

Building Cleanout and Demolition – The interior of the Buildings 2 and 3 were formerly utilized for mixing of petroleum products. As such, six tanks remain within the two buildings. At least one of the tanks contains an unknown material. Various tanks and piping are present throughout the building. Additionally, petroleum residue is apparent along the sides of the tanks, as well as along many walls of the building. Various containers ranging in size from one-gallon to 55-gallons are also present within the building. These containers, along with the tanks and piping will be removed from the buildings. The underlying concrete slab will also be removed and disposed off-Site. Photographs of building interior and on-Site tanks is included in Attachment A.

Buildings 2 and 3 are scheduled for building demolition. Owner's Site contractor, Lazarus Industries LLC, is currently obtaining required building demolition permits from the City of Buffalo. The buildings will be demolished and building debris disposed off-Site. Additionally, the concrete floor slabs will be removed to allow for remedial investigations to be completed.

3.3 Field Investigation Activities

Prior to intrusive activities, WGS and appropriate subcontractors will contact Dig Safely New York a minimum of three business days prior to the commencement of the field work. Investigative procedures are described below:

3.3.1 Surface Soil Investigation

The Site is planned for complete development, with final surfaces anticipated to be concrete, asphalt or buildings. Due to planned development and no surface areas remaining, surface soils will not be investigated during the RI work.

3.3.2 Subsurface Soil Investigation

Soil sampling which has been completed on-Site identified the presence of SVOCs and metals within the fill soils at the Site. Subsurface soil sampling will include the soil constituents located beneath the building floor of Building 1, investigation of Building areas 2 and 3 after demolition, as well as throughout the Site. Three (3) soil borings are planned within Building 1 and six (6) soil borings will be completed at exterior areas. Three of the exterior soil boring locations will be converted to groundwater wells (total of 3 proposed monitoring wells). Proposed soil boring locations are shown on Figure 5.

Interior soil borings will be cored through the concrete floor or be completed with a drill rig equipped with a concrete core barrel. A drill rig capable of advancing a borehole using direct push method via a Geoprobe drill rig will be used to advance the interior locations that will not be completed as monitoring wells. The drill rig will advance the 1.5-inch diameter, 4-foot long core sample liner to the desired depth and retrieve soil core samples at four foot intervals. The total depth of interior borings, as well as three of the exterior borings, is anticipated to be approximately 12 feet below grade or spoon refusal, whichever is encountered first.

The three monitoring well locations will be advanced using a drill rig or direct-push drill rig capable of advancing hollow-stem augers for installing 1-inch micro-monitoring wells which are expected to be completed with continuous sampling to depths of up to 20 to 25 feet below grade to assess if the native clay extends to greater depths.

Discrete subsurface soil samples will be field screened in approximate two-foot depth intervals the full depth drilled for VOCs with a calibrated organic vapor meter equipped with a photoionization detector (PID). Organic vapor meter results and soil descriptions will be recorded on the field soil boring logs.

Soil samples will be selected for analytical analysis based in field screening results, visual and olfactory observations. During initial investigations, granular and cohesive fill was encountered to depths of approximately 4 to 7 feet below grade. Soil borings will be extended through the fill material to underlying native clay. WGS will collect representative samples from each of the identified fill types, as well as the underlying native clay soils, for appropriate laboratory analysis.

The sample interval identified as the most impacted (i.e., highest PID reading, visual/olfactory evidence of odors, staining, or product) will be selected for analysis. Should fill material be encountered, a discrete sample will be collected from each type of fill soil. In the event that no impacts were identified, the native soils directly below the fill/native interface will be selected for analysis. Additionally, attempt will be made to collected soil samples at vertical variations within the native soil.

Subsurface soil samples collected from the soil borings will be selected for analysis for the following as shown on Table 1:

- Five (5) soil samples for TCL VOCs
- Five (5) soil samples for TCL SVOCs
- Five (5) soil samples for TAL metals
- Three (3) soil samples for PCBs
- Two (2) soil samples for pesticides and herbicides
- One (1) soil samples for 1,4-dioxane
- One (1) soil samples for per- and polyfluoroalkyl substances (PFAS)

Actual sample locations will be selected in the field based on utility locations, field observations, screening results, and engineering judgment. Subsurface soil samples will be collected using dedicated stainless-steel sampling tools. Select representative soil samples will be place in pre-cleaned laboratory-provided sample bottles, labeled and cooled to 4ºC in the field, and transported under chain-of-custody to a NYSDOH ELAP certified analytical laboratory.

3.3.3 Test Pit Excavations

In addition to the soil borings, remedial investigation will also include completion of sixteen (16) test pits to further investigate and characterize Site soil conditions. Test pits locations are included on Figure 5 and will be completed with a tracked excavator capable of reaching a minimum of 15 feet below grade. The depth of the test pit will extend 2 to 3

feet into underlying native soils.

In accordance with NYSDEC DER-10 Technical Guidance to Site Investigation and Remediation (DER-10), a Community Air Monitoring Plan (CAMP) will be implemented during all ground intrusion activities. A CAMP will be completed to achieve real-time monitoring of volatile organic compounds (VOCs) and particulates (dust). A copy of the CAMP is provided in Attachment A of the Health & Safety Plan (HASP), included in Appendix E.

Discrete subsurface soil samples will be field screened in approximate one to two-foot depth intervals through the excavation for VOCs with a calibrated organic vapor meter equipped with a photoionization detector (PID). Organic vapor meter results and soil descriptions will be recorded on the field soil boring logs.

Soil samples will be selected for analytical analysis based in field screening results, visual and olfactory observations. The sample interval identified as the most impacted (i.e., highest PID reading, visual/olfactory evidence of odors, staining, or product) will be selected for analysis. Should fill material be encountered, a discrete sample will be collected from each type of fill soil.

Subsurface soil samples collected from the test pits will be selected for analysis for the following as shown on Table 1:

- Eight (8) soil samples for TCL VOCs
- Ten (10) soil samples for TCL SVOCs
- Ten (10) soil samples for TAL metals
- Ten (10) soil samples for PCBs
- Two (2) soil samples for pesticides and herbicides
- One (1) soil samples for 1,4-dioxane
- One (1) soil samples for per- and polyfluoroalkyl substances (PFAS)

Actual sample locations will be selected in the field based on utility locations, field observations, screening results, and engineering judgment. Subsurface soil samples will be collected using dedicated stainless-steel sampling tools. Select representative soil samples will be place in pre-cleaned laboratory-provided sample bottles, labeled and cooled to 4^{o}C in the field, and transported under chain-of-custody to a NYSDOH ELAP certified analytical laboratory.

3.3.4 Monitoring Well Installation

Three (3) soil boring locations will be converted to monitoring wells. The soil borings will be advanced with a drill-rig capable of advancing hollow-stem augers capable of installing 2-inch monitoring well. The wells will be utilized for measurement of groundwater depth and collection of groundwater samples. The three proposed locations are included on Figure 5.

After completion of the soil borings to depths of approximately 20 to 25 feet below grade, a 2-inch diameter, schedule 40 PVC monitoring well will be installed at each location.

Groundwater samples will be evaluated as per NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (DER-10) and, if necessary, soil borings/wells will be advanced to the required depths of groundwater. An approximate 10-foot length of 0.010-inch machine slotted well screen will be installed at each location attached to the riser. The well screen depth will be backfilled with silica sand filter pack (estimated at size #0) from the base to approximately 2 feet above the well screen. A bentonite seal will be placed above the sand and hydrated to limit potential for down-hole contamination. The top of the well riser will be flush with the ground surface and completed with a locking J-plug. The well will be finished with a flush-mounted road box.

Groundwater samples will be collected from each of the monitoring wells using low flow sampling techniques. The total depth of the wells is expected to be approximately 20 feet below grade.

3.3.5 Monitoring Well Development

After a minimum of 24-hours from installation, the monitoring wells will be developed using dedicated disposable polyethylene bailers via purge methodology. Field parameters, including pH, temperature, turbidity, and specific conductance will be measured periodically until they become relatively stable (approximately 10% fluctuation or less). A minimum of three well volumes will be removed from each monitoring well, unless dry well conditions are encountered. Development water will be containerized and sampled for future off-Site disposal.

3.3.6 Groundwater Sampling

Prior to sample collection, static groundwater levels will be measured at each of the monitoring wells. The wells will be purged and field measurements of pH, specific conductivity, temperature and turbidity will be recorded and monitored for stabilization prior to sampling. Groundwater samples will be collected using low flow sampling techniques. If insufficient groundwater, new dedicated disposable bailers may be used to collect the groundwater samples.

The three (3) groundwater samples will be analyzed for the following parameters as summarized on Table 1:

- Target Compound List (TCL) VOCs
- TCL semi-volatile organic compounds (SVOCs)
- Target Analyte List (TAL) metals (total)
- Target Analyte List (TAL) metals (dissolved phase)
- Polychlorinated bi-phenyls (PCBs)
- Pesticides
- Herbicides
- 1,4-dioxane (3 samples only)
- PFAS

Groundwater samples will be evaluated as per NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (DER-10) and, if necessary, soil borings/wells will be

advanced to the required depths of groundwater. Groundwater samples will be placed in pre-cleaned laboratory-provided sample bottles, labeled and preserved in accordance with USEPA SW-846 methodology, and transported under chain-of-custody to a NYSDOH ELAP certified analytical laboratory.

Groundwater and soil sample collection procedure for PFAS will be done in accordance with NYSDEC protocol identified in "Guidelines for Sampling and Analysis of PFAS, Under NYSDEC's Part 375 Remedial Programs" dated January 2020. Groundwater samples will be analyzed for PFAS via EPA method 537, to achieve reporting limits of 2 ng/l (parts per trillion (ppt)).

3.3.7 Soil Vapor Intrusion Investigation

The current building, identified as Building 1, is planned to remain on site. Building 1 includes approximately 2,500 square foot one-story concrete block building. The building was completely gutted, included roof and heating system, during site preparation. A new metal roof was installed in March 2020. Current development plans do not include additional or future buildings at the site.

Building Survey

An inspection of the existing on-site facility and product inventory will be conducted to assess the current conditions in proposed sampling areas and determine the likelihood of existing chemicals of concern that may be present that would influence the vapor test results. A PID will be used to monitor indoor air and scan vapors of individual containers that may be present. Any potential sources identified inside the facility will be removed prior to conducting the vapor test.

Site Preparation

In accordance with NYSDOH recommendations, the HVAC system should be activated. However, the building was gutted and an HVAC system is not currently present.

Vapor Sampling

Three types of air samples will be collected, including sub-slab, ambient indoor air and ambient outdoor air samples, as follows:

- **Sub-Slab:** WGS will install one (1) temporary sub-slab sampling point near the center of the building. The sample will be obtained through core-drilled holes into a competent portion of the concrete floor, away from cracks or drains. Clean, dedicated ¼-inch inside diameter polyethylene tubing will be placed into the hole and will not extend further than 2-inches into the sub-slab material. The core hole annulus will be sealed at the floor surface with modeling clay. Once it is determined that the sampling system is sealed, the sample probe and tube will be purged of one to three volumes, and sampling will be initiated.

  The sub-slab soil gas sample will be collected using a 2.7-liter capacity Summa canister fitted with a laboratory calibrated flow regulation devise to allow the collection of the soil gas sample over an 8-hour sample collection time.

- **Ambient Indoor Air:** An ambient indoor air sample will be collected concurrent with the sub-slab sample locations from approximately 3 to 4 feet above the slab floor. A total of 1 sample will be obtained, collected over an 8-hour collection period.

- **Ambient Outdoor Air:** One ambient outdoor sample will be collected at an upwind location from approximately 4 to 5 feet above the ground surface. A sample will be collected over an 8-hour collection period.

All sampling and purging flow rates will not exceed 0.2 liters per minute. Since the ambient outdoor air sample is dependent on wind flow direction, that sample location will be determined the day of the test.

3.3.8 Field Specific Quality Assurance/Quality Control Sampling

Field-specific quality assurance/quality control samples will be collected and analyzed, as summarized on Table 1 to support third-party data usability assessment effort. Site-specific QA/QC samples will include blind duplicate, matrix spike/matrix spike duplicate, rinsate blank, and trip blank.

3.4 Investigation- Derived Waste Management

During the completion of soil borings, removed materials will be placed into the borehole. The excess soil cuttings that cannot be replaced into the borehole will be containerized in 55-gallon drums. Based on analytical testing results, the excess soil may be utilized on-Site, or disposed off-Site. Development/purge water generated during well development and/or sampling activities will be containerized in 55-gallon drums for testing and future off-Site disposal.

3.5 Site Mapping

A base map will be prepared by a New York State-licensed surveyor. The map will include the RI investigation/sampling locations. Soil/fill boring locations will be field located and incorporated within the survey. Elevations of the ground surface and top of PVC riser will be measured for each monitoring well.

3.6 Personnel Decontamination

The degree of decontamination is a function of both the particular task and the physical environment in which it takes place. Decontamination procedures will remain flexible, thereby allowing the decontamination crew to respond appropriately to changing conditions at the Site. On-Site sampling activities will be carried out in such a manner as to avoid gross contamination of Site workers, personal protective equipment, machinery and equipment.

Between sampling locations (or sometimes between samples at one sampling location), and upon the completion of the daily field activities, Site workers will proceed to the Contaminated Reduction Zone (CRZ) or mobile reduction zone area. Equipment (e.g., sampling tubes, shovels, tools, etc.) will be decontaminated in this area. Prior to leaving the Site for breaks, at the end of the work shift, or when PPE has been grossly contaminated, disposable boot covers, gloves, and

suits will be removed and placed in a drum designated for the disposal of these materials. After removing PPE, each Site worker will wash with soap and fresh water prior to donning new PPE or leaving the Site for the day. All wash water and rinse water will be collected and disposed of in accordance with appropriate regulations.

3.7 Decontamination of Equipment

Equipment decontamination efforts will be conducted in the CRZ or mobile reduction zone areas. Gross contamination will first be removed with plastic scrapers or other appropriate tools. The equipment will be decontaminated at a temporary equipment decontamination pad in the CRZ via hand washing or pressure washing. Downhole tools and augers can be hand washed or pressure washed.

The decontamination of the direct push drilling rig, excavator, or other heavy equipment will be undertaken as necessary. Initially, scraping of the equipment will remove heavily caked materials prior to washing. Washing will then be accomplished by pressure washing. Water generated during decontamination activities may be allowed to discharge in the ground at the test pit location or may be collected, stored and profiled for future off-Site disposal.

3.8 Disposal of Contaminated Materials

Potentially contaminated materials (gloves, clothing, sample sleeves etc.) will be bagged and segregated for proper disposal. Investigation-derived waste will be managed in accordance with NYSDEC guidance regulations. All fluids collected during groundwater sampling and decontamination will be containerized and managed appropriately subsequent to field activities and decontamination procedures.

4.0 REMEDIAL INVESTIGATION/ALTERNATIVES ANALYSIS REPORT

Upon completion of the RI tasks, a Remedial Investigation/Alternative Analysis (RI/AA) Report will be generated in general requirements as identified in DER-10 Section 3.14. The report will include the following information.

- Background and Site information.
- Description of investigation areas.
- Identify and characterize the sources of contamination.
- Comparison with cleanup levels during the alternatives analysis report (AAR).
- Describe the amount, concentration, environmental fate and transport (if necessary), location and other significant characteristics of the contaminants present.
- Define hydraulic factors, as needed.
- Provide a qualitative human exposure assessment.
- Identify actual or potential adverse impacts to fish and wildlife resources

An independent data validation expert will complete a third-party data review of the analytical data generated during the RI work. A Data Usability Summary Report (DUSR) will be prepared, with appropriate data qualifiers added to the results.

The RI report will also include an alternatives analysis to evaluate a remedial approach. The AAR will evaluate the need for further remedial activities.

Remedial action objectives will be evaluated and developed to assure the selected remedy is protective of human health and the environment under the proposed future Site usage. Proposed soil cleanup objectives will be based on proposed future usage. Should further remedial requirements be identified, a list of potentially applicable remedial technologies will be developed and evaluated. Criteria to be evaluated for the remedy and protectiveness to public health and the environment include:

- Overall protection of the public health and the environment
- Standards, criteria and guidance (SCG)
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility or volume of contamination through treatment
- Short-term impact and effectiveness
- Implementability
- Cost effectiveness
- Land use

A remedial alternative will be recommended for the Site, which will include a discussion on the reasons for the selection. Community acceptance and comments will be evaluated within the alternative selection.

5.0 ADDITIONAL PROJECT DOCUMENTS

Various supporting documents have been prepared associated with the RI/AAR work plan and included in the appendix as listed below.

5.1 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) was generated in general accordance with Section 2.4 in DER-10. The QAPP describes the quality assurance/quality control (QA/QC) protocols and guidance associated with the RI/AAR Work Plan to ensure the suitability and verifiable data result from the sampling and analysis. The QAPP also provides procedures to be used during sampling of various media, field activities, and analytical laboratory testing. The QAPP is included in Appendix D.

5.2 Health and Safety Plan

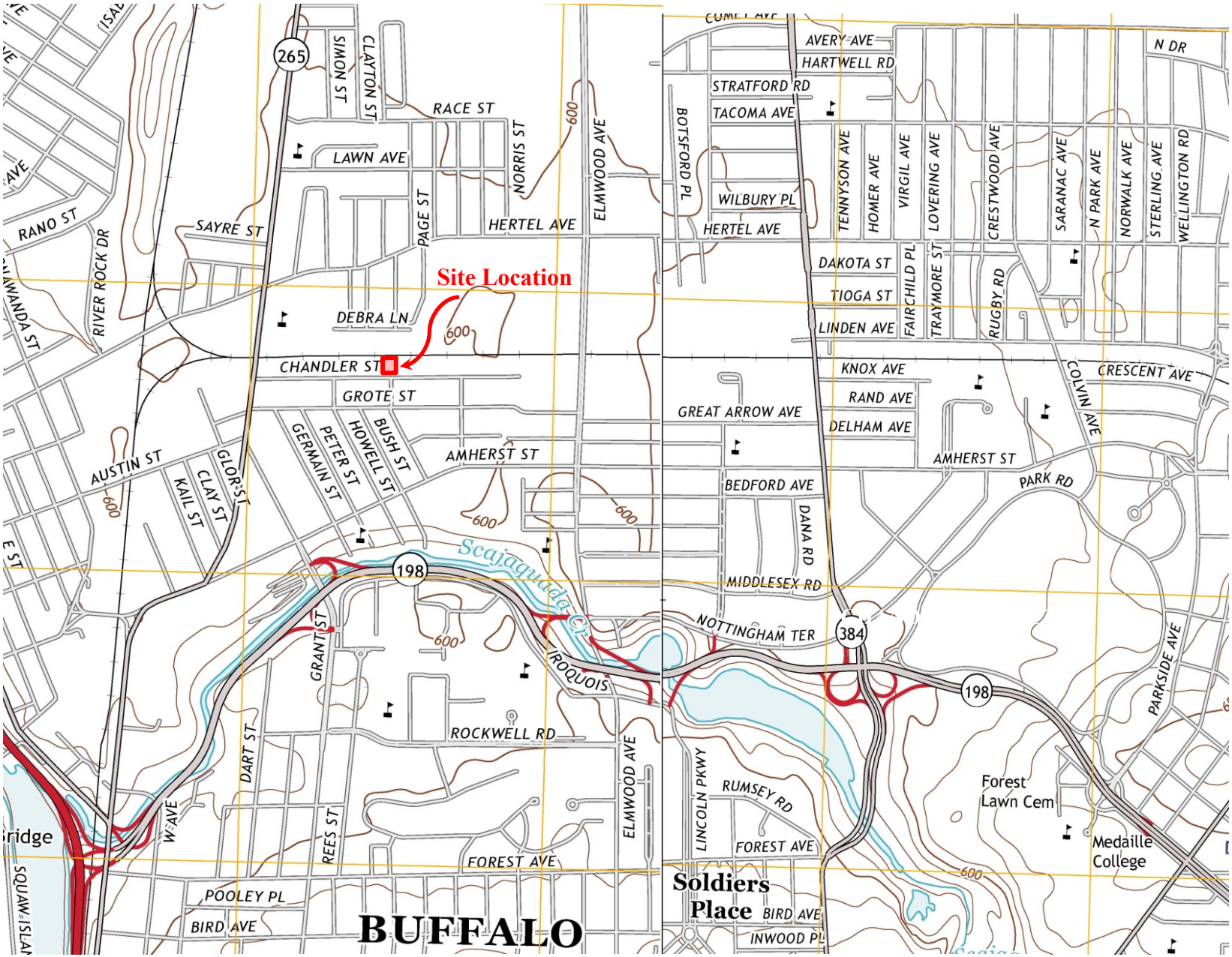
A Site-specific Health and Safety Plan (HASP) has been prepared for this project and included in Appendix E. The HASP will be enforced by HEI, WGS and subcontractors associated with the RI field activities. The HASP covers the on-Site investigation and interim remedial work. Subcontractors will be required to develop and implement their health and safety plan.

The HASP will include a Community Air Monitoring Plan (CAMP) to describe particulate and volatile organic vapor monitoring to protect nearby community during the investigative and excavation activities.

6.0 PROJECT SCHEDULE

The Applicant has requested the project be placed on a fast track. Figure 6 presents the tentative schedule for planned activities in order to meet Applicants aggressive schedule. The Applicant plans to open the development by end of May 2020. A certificate of completion (COC) is anticipated by December 2020.

FIGURES



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WITTMAN GEOSCIENCES, PLLC	Date: 03/2020	**Site Location**	Project: 19211
	Scale: not to scale	C915354, 140 Chandler Street, Buffalo, NY	Figure: 1

WITTMAN GEOSCIENCES, PLLC	Date: 03/2020	**BCP Site Limits**	Project: 19211
	Scale: not to scale	C915354, 140 Chandler Street, Buffalo, NY	Figure: 2

LOCATION	SB8 (2.5-6.5')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	2.3
Benzo(a)pyrene	2.3
Benzo(b)fluoranthene	3.4
Benzo(k)fluoranthene	0.91
Chrysene	2.4
Dibenzo(a,h)anthracene	0.36 J
Indeno(1,2,3-cd)pyrene	1.6

LOCATION	SB12 (0-3')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	18
Benzo(a)pyrene	16
Benzo(b)fluoranthene	20
Benzo(k)fluoranthene	6.7
Chrysene	16
Dibenzo(a,h)anthracene	2.6
Indeno(1,2,3-cd)pyrene	9.7

LOCATION	SB4 (0-4')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	1.2
Benzo(a)pyrene	1.2
Benzo(b)fluoranthene	1.6
Chrysene	1.1
Indeno(1,2,3-cd)pyrene	0.8

LOCATION	SB1 (2-5)
Benzo(a)anthracene	4.9
Benzo(a)pyrene	3.8
Benzo(b)fluoranthene	5.1
Benzo(k)fluoranthene	1.6
Chrysene	4.4
Dibenzo(a,h)anthracene	0.53 J
Indeno(1,2,3-cd)pyrene	2.1

LOCATION	SB3 (1-4')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	6.2
Benzo(a)pyrene	4.1
Benzo(b)fluoranthene	5.8
Benzo(k)fluoranthene	2.1
Chrysene	4.8
Dibenzo(a,h)anthracene	0.79
Indeno(1,2,3-cd)pyrene	2.8

SB10 SB11 SB12 SB15 SB13 SB16 SB14 SB9 SB8 SB7 SB6 SB4 SB1 SB2 SB3 SB5

TB1 TB2 TB3

Former Building Location

Area for future investigation

Building 1 – To Remain

Building 2 – To Be Demolished

Building 3 – To Be Demolished

1 STORY BRICK BLDG. NO. 140

B G. NO. 150

= Soil Boring Location (5/19)

= Test Pit Location (5/19)

Notes:
= exceeds Restricted Residential SCO
= exceeds Commercial SCO
= exceeds Industrial SCO

WITTMAN GeoSciences, PLLC

SCALE IN FEET: 1" =20'

0 20

TITLE: Previous Sampling Locations exceeding Restricted Residential Soil Cleanup Objectives

PROJECT NAME / LOCATION: C915354
140 Chandler Street – Western Portion
Buffalo, NY

DATE: 03/2020

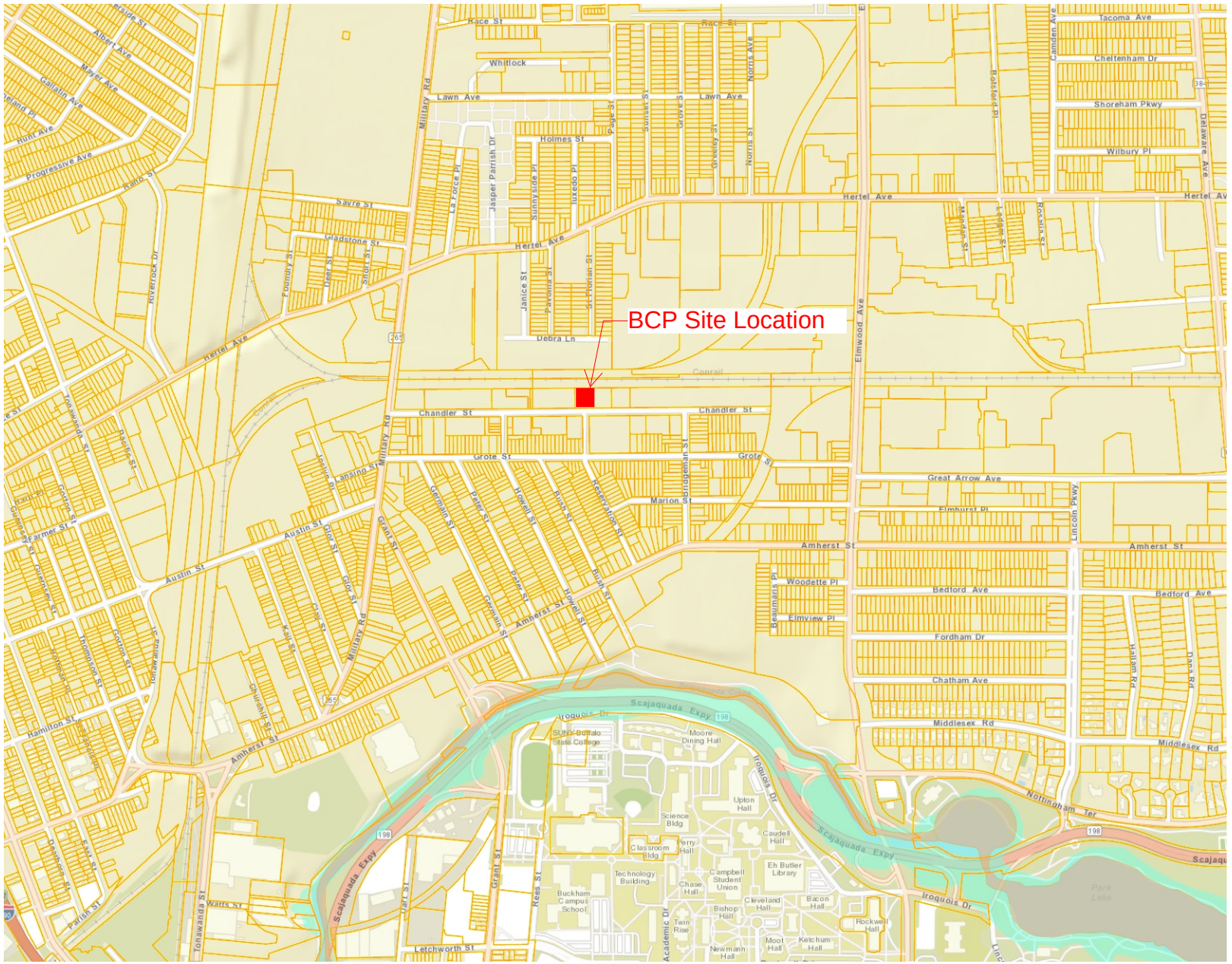
FIGURE: 3

PROJECT NO.: 19211

DRAWN BY: CMC

CHECKED BY: MMW

Erie County On-Line Mapping Application



Legend

- Parcels
- DEC Wetlands
- National Wetlands Inventory
  - Wetlands
  - No Digital Data
- FEMA Floodplains
- Municipal Boundaries

Figure 4
Nearby Wetland and Floodplain Locations

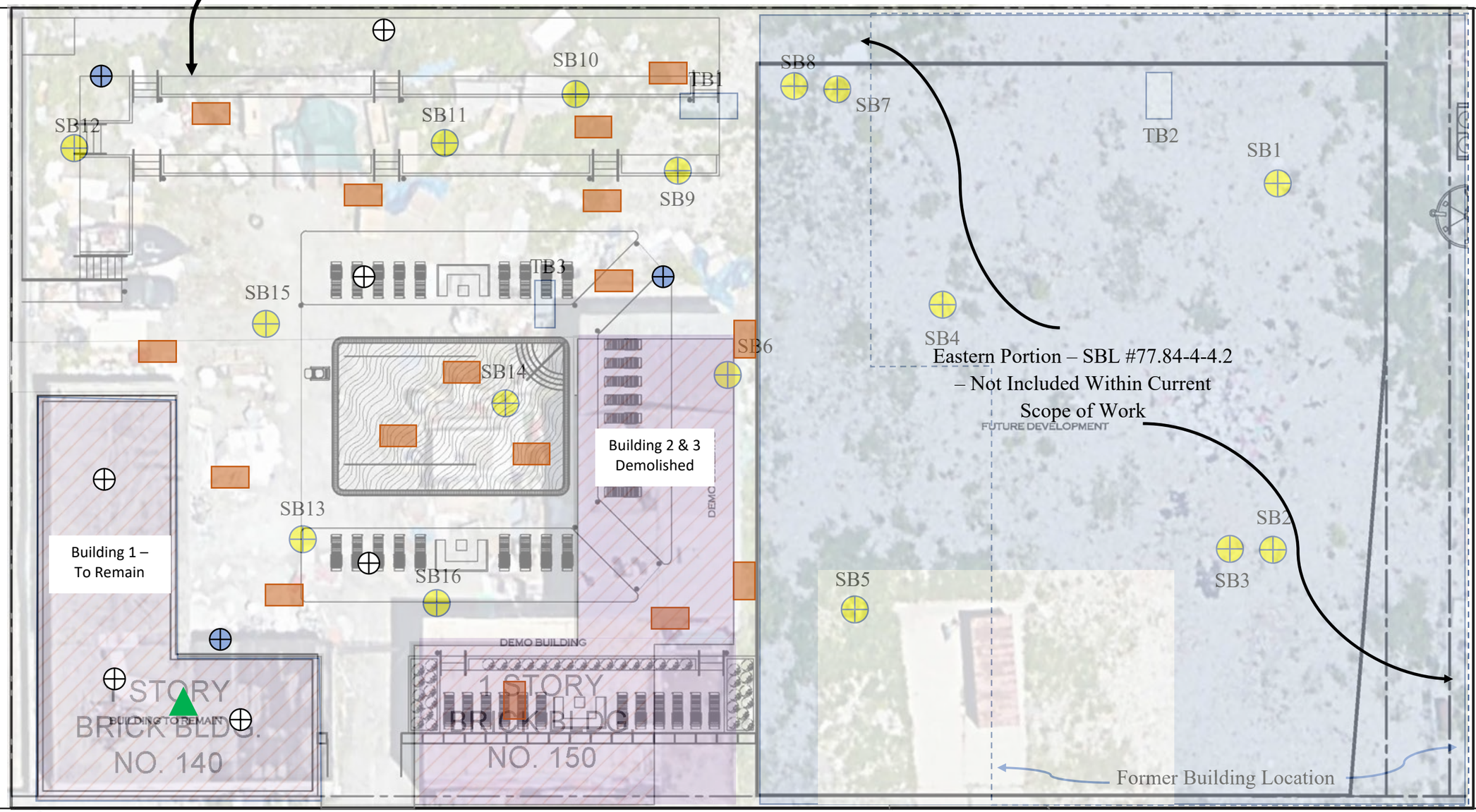
0 1,504.66 3,009.3 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
THIS MAP IS NOT TO BE USED FOR NAVIGATION

ERIE COUNTY
DEPARTMENT OF ENVIRONMENT & PLANNING
OFFICE OF GIS

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

1: 18,056



= Soil Boring Location (5/19)

= Test Pit Location (5/19)

= Proposed Geoprobe Location – 12 foot depth

= Proposed Monitoring Well Location

= Proposed Test Pit Location

= Vapor Intrusion Sample Location

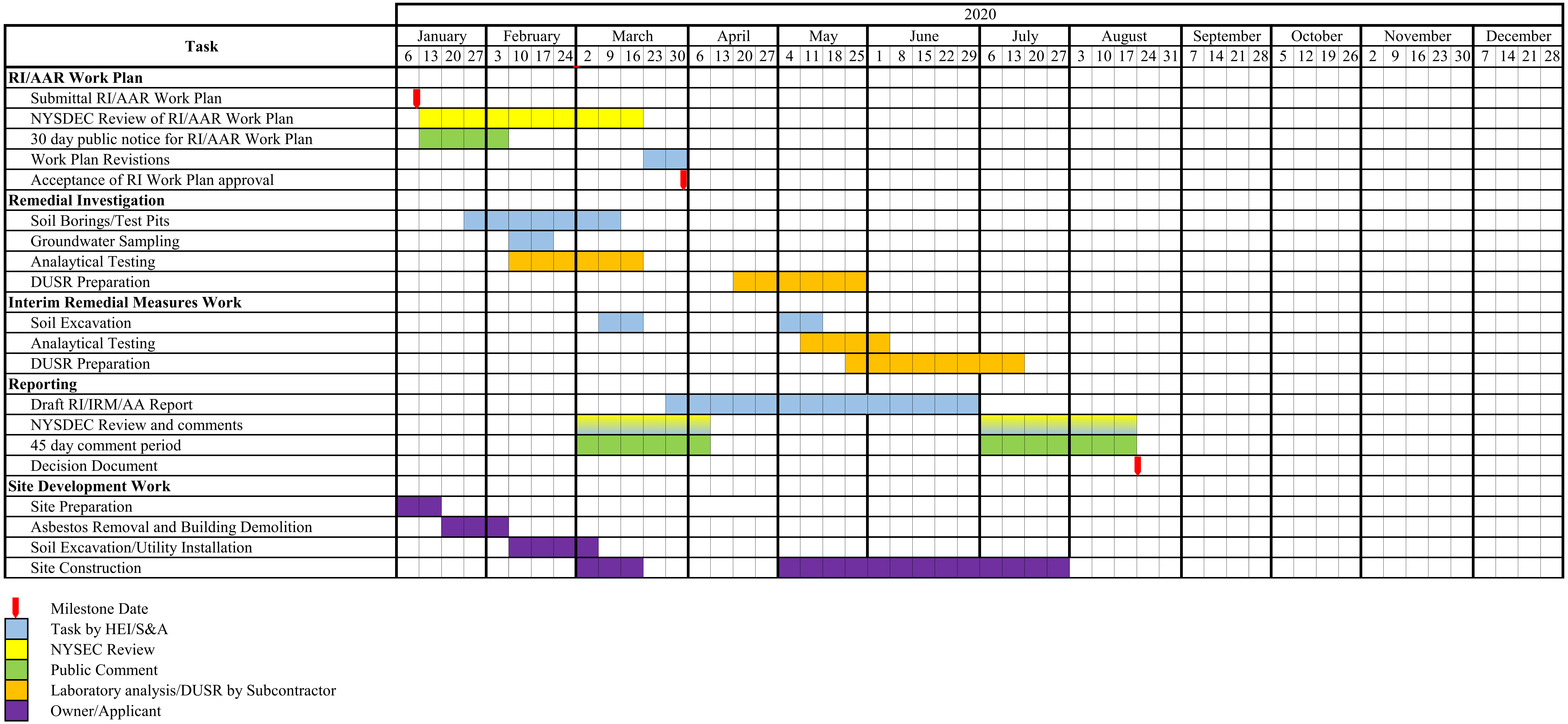
WITTMAN GeoSciences, PLLC

SCALE IN FEET: 1" =20'

0 20

TITLE: Proposed Remedial Investigation Locations	PROJECT NAME / LOCATION: 140 CHANDLER STREET BUFFALO, NEW YORK	DATE: 05/2020	FIGURE: 5
		PROJECT NO.: 19211	DRAWN BY: CMC
			CHECKED BY: MMW

Figure 6
BCP Project Schedule
140 Chandler Street Site
140 Chandler, Buffalo, NY



TABLES

TABLE 1
Analytical Testing Program Summary
Western Portion - 140 Chandler Street Site
140 Chandler, Buffalo, NY
NYSDEC Brownfield Cleanup Program - #C915354

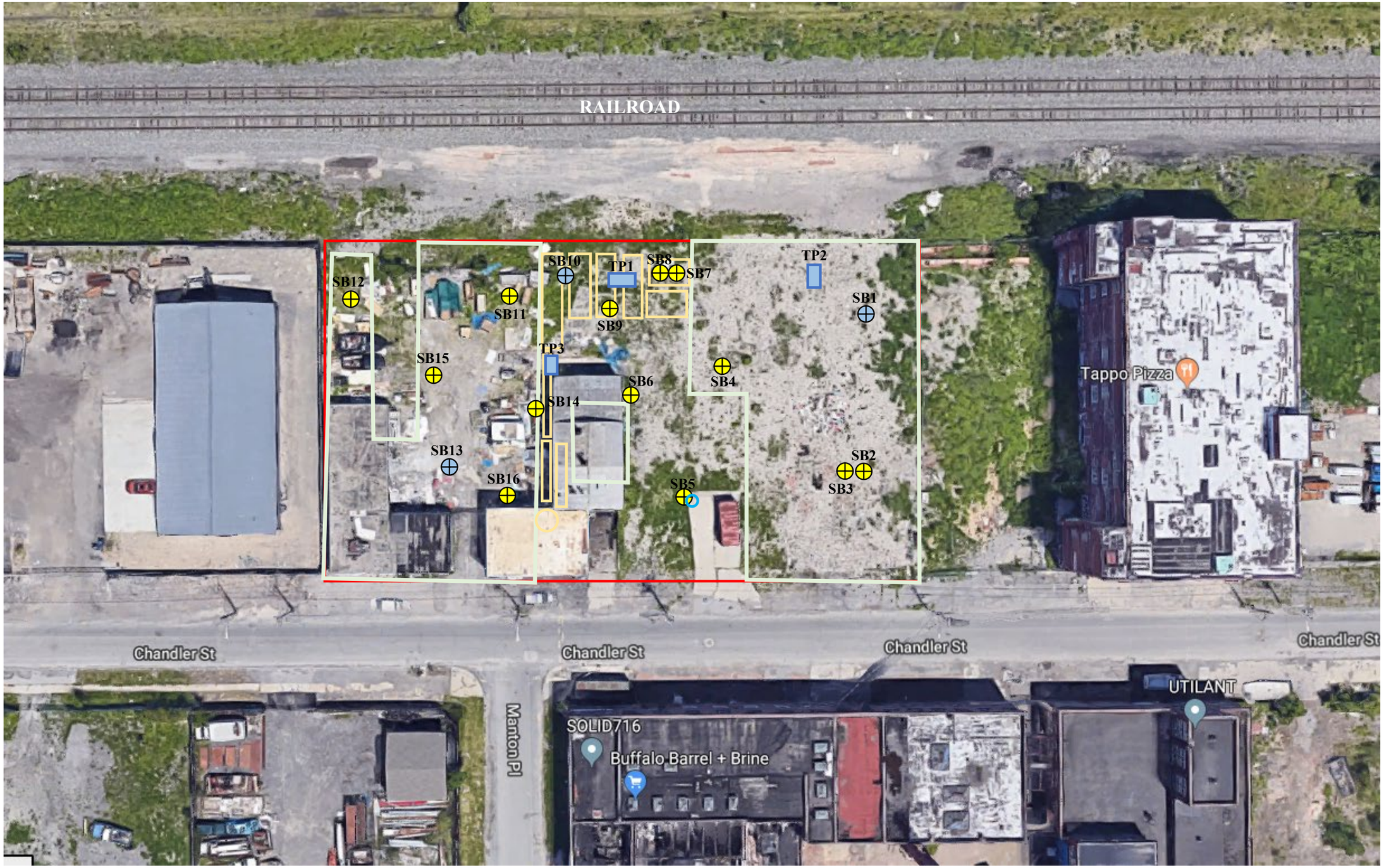
Location	Number of Proposed Locations	Matrix	TCL VOCS	TCL SVOCs	TAL METALS Total	TAL METALS dissolved	PCBs	Pest/ Herbs	VOC TO-15	1,4-dioxane	PFAS
Surface Soil Samples											
Surface Soil Sample	0	Soil	-	-	-	-	-	-	-	-	-
Duplicate		Soil	-	-	-	-	-	-	-	-	-
MS/MSD		Soil	-	-	-	-	-	-	-	-	-
Rinsate		Water	-	-	-	-	-	-	-	-	-
Total			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Soil Borings - Subsurface Samples											
Soil Boring Locations	9	Soil	5	5	5	-	3	2	-	1	1
Duplicate		Soil	1	1	1	-	1	1	-	-	-
MS/MSD		Soil	2	2	2	-	2	2	-	-	-
Rinsate		Water	1	1	1	-	1	1	-	-	-
Total			**9**	**9**	**9**	**0**	**7**	**6**	**0**	**1**	**1**
Test Pits - Subsurface Samples											
Test Pit Locations	16	Soil	8	10	10	-	10	2	-	2	2
Duplicate		Soil	1	1	1	-	1	1	-	1	1
MS/MSD		Soil	2	2	2	-	2	2	-	2	2
Rinsate		Water	1	1	1	-	1	1	-	1	1
Total			**12**	**14**	**14**	**0**	**14**	**6**	**0**	**6**	**6**
Monitoring Wells											
Monitoring Well	3	Groundwater	3	3	3	3	3	3	-	3	3
Duplicate		Groundwater	1	1	1	1	1	1	-	1	1
MS/MSD		Groundwater	2	2	2	2	2	2	-	2	2
Rinsate		Water	1	1	1	1	1	1	-	1	1
Trip Blank		Water	1	-	-	-	-	-	-	-	1
Total			**8**	**7**	**7**	**7**	**7**	**7**	**0**	**7**	**8**
Sub-slab Vapor/Ambient Air samples											
Sub-slab	1	Air	-	-	-	-	-	-	1	-	-
Ambient Air	1	Air	-	-	-	-	-	-	1	-	-
Outdoor	1	Air	-	-	-	-	-	-	1	-	-
Duplicate		Air	-	-	-	-	-	-	1	-	-
Total			**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**
			VOCs	SVOCs	METALS	METALS	PCBs	Pest/ Herbs	VOC - TO-15	1,4-dioxane	PFAS
	TOTAL SAMPLES		**29**	**30**	**30**	**7**	**28**	**19**	**4**	**14**	**15**

Notes:

TCL VOCs - Target Compound List Volatile Organic Compounds.
TCL SVOCs - Target Compound List Semi-volatile Organic Compounds.
TAL Metals - Target Analyte List Metals.
TCL PCBs - Target Compound List Polychlorinated Biphenyls.
PFAS - Polyfluoroalkyl Substances

APPENDIX A

HISTORICAL INVESTIGATION INFORMATION



KEY

= Soil Boring Location

= Groundwater Sample Location

= Former building location

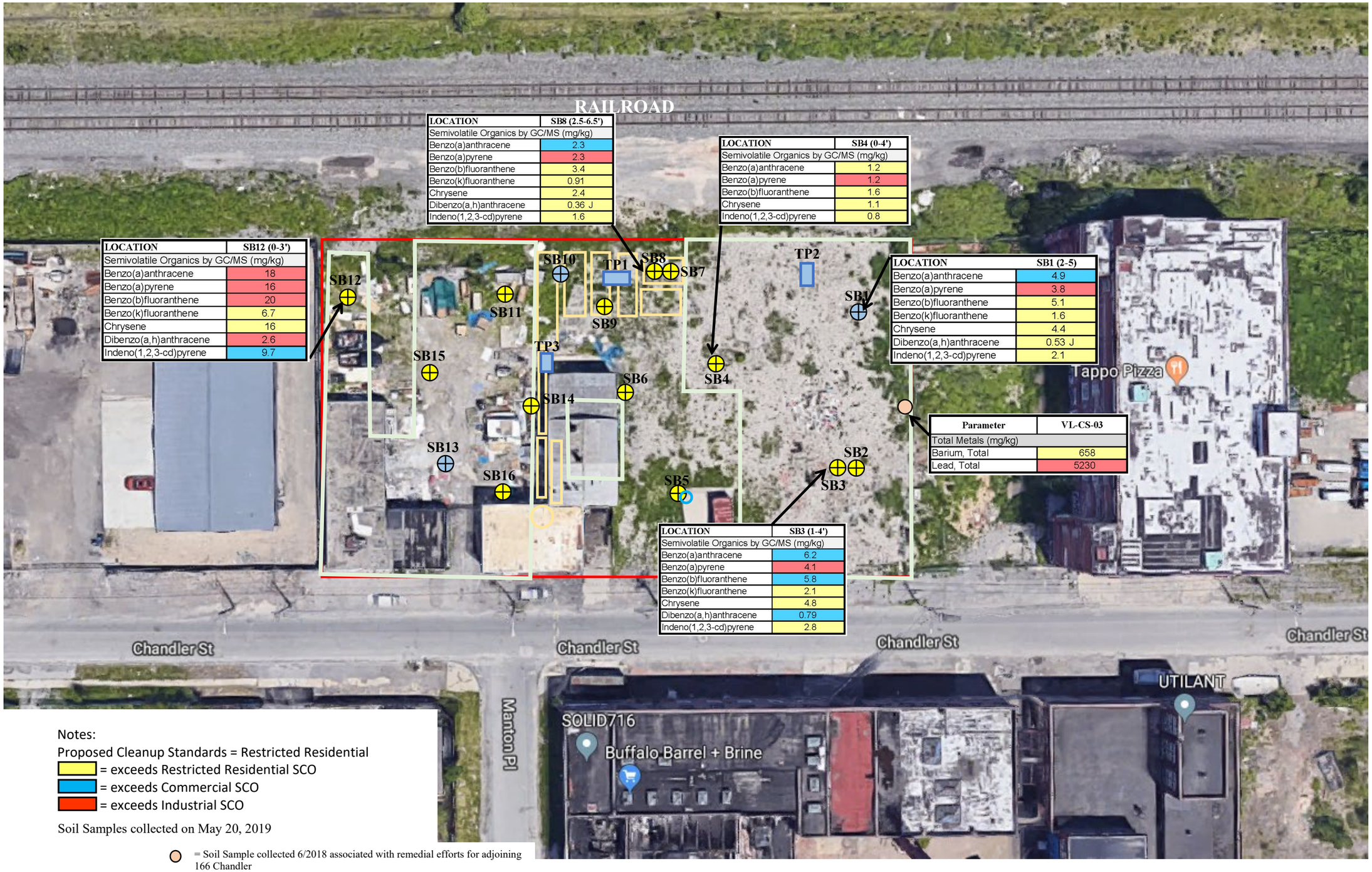
= Test Pit location

= Former tank location

= Former gas tank location

WITTMAN GeoSciences, PLLC

WITTMAN GEOSCIENCES, PLLC	Soil Boring Sampling Locations	DRAWN BY: MMW	SCALE: NTS	PROJECT: 19211
	140 Chandler, Buffalo, NY	CHECKED BY: MMW	DATE: 06/2019	FIGURE NO: III-A



LOCATION	SB12 (0-3')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	18
Benzo(a)pyrene	16
Benzo(b)fluoranthene	20
Benzo(k)fluoranthene	6.7
Chrysene	16
Dibenzo(a,h)anthracene	2.6
Indeno(1,2,3-cd)pyrene	9.7

LOCATION	SB8 (2.5-6.5')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	2.3
Benzo(a)pyrene	2.3
Benzo(b)fluoranthene	3.4
Benzo(k)fluoranthene	0.91
Chrysene	2.4
Dibenzo(a,h)anthracene	0.36 J
Indeno(1,2,3-cd)pyrene	1.6

LOCATION	SB4 (0-4')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	1.2
Benzo(a)pyrene	1.2
Benzo(b)fluoranthene	1.6
Chrysene	1.1
Indeno(1,2,3-cd)pyrene	0.8

LOCATION	SB1 (2-5)
Benzo(a)anthracene	4.9
Benzo(a)pyrene	3.8
Benzo(b)fluoranthene	5.1
Benzo(k)fluoranthene	1.6
Chrysene	4.4
Dibenzo(a,h)anthracene	0.53 J
Indeno(1,2,3-cd)pyrene	2.1

Parameter	VL-CS-03
Total Metals (mg/kg)	
Barium, Total	658
Lead, Total	5230

LOCATION	SB3 (1-4')
Semivolatile Organics by GC/MS (mg/kg)	
Benzo(a)anthracene	6.2
Benzo(a)pyrene	4.1
Benzo(b)fluoranthene	5.8
Benzo(k)fluoranthene	2.1
Chrysene	4.8
Dibenzo(a,h)anthracene	0.79
Indeno(1,2,3-cd)pyrene	2.8

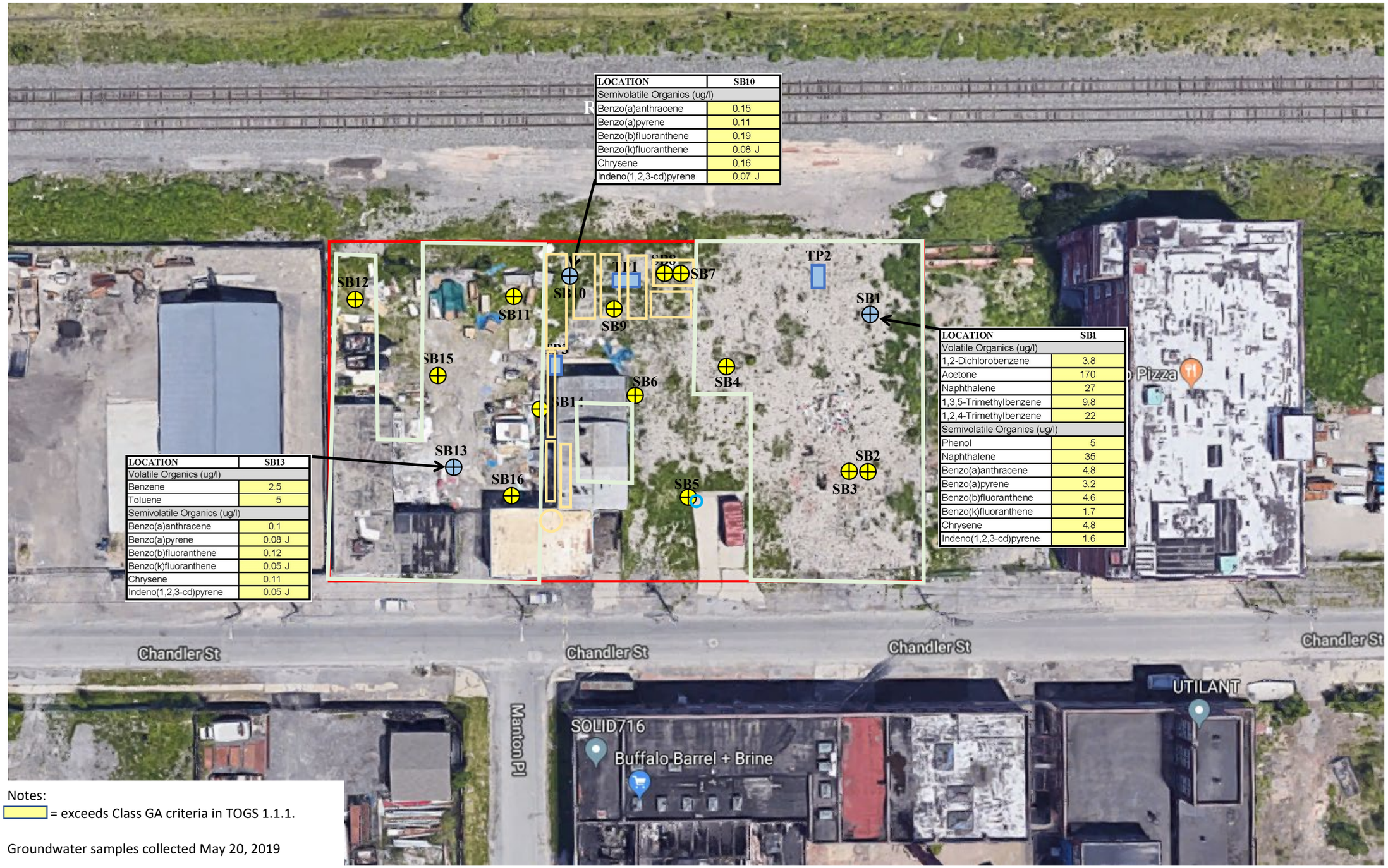
Notes:
Proposed Cleanup Standards = Restricted Residential
= exceeds Restricted Residential SCO
= exceeds Commercial SCO
= exceeds Industrial SCO
Soil Samples collected on May 20, 2019

= Soil Sample collected 6/2018 associated with remedial efforts for adjoining 166 Chandler

= Soil Boring Location
= Groundwater Sample Location
= Former building location
= Test Pit location
= Former tank location
= Former gas tank location

WITTMAN GeoSciences, PLLC

WITTMAN GEOSCIENCES, PLLC	Soil Sample Results exceeding Residential USCO	DRAWN BY: MMW	SCALE: NTS	PROJECT: 19211
	140 Chandler, Buffalo, NY	CHECKED BY: MMW	DATE: 06/2019	FIGURE NO: III-B



LOCATION	SB10
Semivolatile Organics (ug/l)	
Benzo(a)anthracene	0.15
Benzo(a)pyrene	0.11
Benzo(b)fluoranthene	0.19
Benzo(k)fluoranthene	0.08 J
Chrysene	0.16
Indeno(1,2,3-cd)pyrene	0.07 J

LOCATION	SB1
Volatile Organics (ug/l)	
1,2-Dichlorobenzene	3.8
Acetone	170
Naphthalene	27
1,3,5-Trimethylbenzene	9.8
1,2,4-Trimethylbenzene	22
Semivolatile Organics (ug/l)	
Phenol	5
Naphthalene	35
Benzo(a)anthracene	4.8
Benzo(a)pyrene	3.2
Benzo(b)fluoranthene	4.6
Benzo(k)fluoranthene	1.7
Chrysene	4.8
Indeno(1,2,3-cd)pyrene	1.6

LOCATION	SB13
Volatile Organics (ug/l)	
Benzene	2.5
Toluene	5
Semivolatile Organics (ug/l)	
Benzo(a)anthracene	0.1
Benzo(a)pyrene	0.08 J
Benzo(b)fluoranthene	0.12
Benzo(k)fluoranthene	0.05 J
Chrysene	0.11
Indeno(1,2,3-cd)pyrene	0.05 J

Notes:

= exceeds Class GA criteria in TOGS 1.1.1.

Groundwater samples collected May 20, 2019

KEY

= Soil Boring Location

= Groundwater Sample Location

= Former building location

= Test Pit location

= Former tank location

= Former gas tank location

WITTMAN GEOSCIENCES, PLLC	**Groundwater Results exceeding Class GA Critier**	DRAWN BY: MMW	SCALE: NTS	PROJECT: 19211
	140 Chandler, Buffalo, NY	CHECKED BY: MMW	DATE: 06/2019	FIGURE NO: III-C

WITTMAN GeoSciences, PLLC

Table 1
Analytical Sample Summary Table
140 Chandler Street, Buffalo, New York

Location	Depth/ Interval (bgs)	VOCs EPA Method 8260 TCL + STARS	SVOCs EPA Method 8270 TCL	Metals EPA Method 6010 TAL	PCBs EPA Method 8082 TCL
Soil Samples					
SB1	2-5'	X	X	X	X
SB3	1-4'	X	X	X	X
SB4	0-4'	X	X	X	X
SB8	2.5-6.5	X	X	X	X
SB12	0-3'		X	X	X
SB14	3-4'	X			
TP3	1-2.5'	X	X	X	X
Water Samples					
SB1	NA	X	X	X	X
SB10	NA	X	X	X	X
SB13	NA	X	X	X	X

Notes:
1.) NA= not applicable.
2. bgs = below ground surface.
3. VOCs = Volatile Organic Compounds.
4. SVOCs = Semi-Volatile Organic Compounds.
5. TCL = Target Compound List.
6. STARS = Spill Technology and Remediation Series.

Table 2
Soil Analytical Sample Summary Table
140 Chandler Street, Buffalo, New York

LOCATION	UUSCO	RRUSCO	CUSCO	IUSCO	SB1 (2-5)	SB8 (2.5-6.5')	SB14 (3-4')	TP3 (1-2.5')	SB3 (1-4')	SB4 (0-4')	SB12 (0-3')
SAMPLING DATE					5/20/2019	5/20/2019	5/20/2019	5/20/2019	5/20/2019	5/20/2019	5/20/2019
LAB SAMPLE ID					L1921330-01	L1921330-02	L1921330-03	L1921330-07	L1921330-08	L1921330-09	L1921330-10
Volatile Organics by GC/MS (mg/kg)											
1,1-Dichloroethane	0.27	19	240	480	ND	0.26	ND	0.0012 U	0.21	0.00034 J	NT
Tetrachloroethene	1.3	5.5	150	300	0.015 J	0.086	ND	ND	0.032	0.00027 J	NT
Chlorobenzene	1.1	100	500	1000	ND	0.53	ND	ND	ND	ND	NT
1,1,1-Trichloroethane	0.68	100	500	1000	ND	0.23	ND	ND	0.032	ND	NT
Benzene	0.06	2.9	44	89	0.016 J	0.035	ND	ND	ND	ND	NT
Toluene	0.7	100	500	1000	0.083	0.17	0.5	0.0019	0.063	0.00095 J	NT
Ethylbenzene	1	30	390	780	0.097	0.13	0.031 J	0.00024 J	0.071	0.0012	NT
Trichloroethene	0.47	10	200	400	0.021 J	0.024 J	ND	ND	0.014 J	ND	NT
1,2-Dichlorobenzene	1.1	100	500	1000	0.56	4	ND	ND	3.7	0.014	NT
1,3-Dichlorobenzene	2.4	17	280	560	0.022 J	0.29	ND	ND	0.14	0.00039 J	NT
1,4-Dichlorobenzene	1.8	9.8	130	250	0.05 J	0.74	ND	ND	0.32	0.00074 J	NT
Methyl tert butyl ether	0.93	62	500	1000	ND	0.12 U	0.05 J	ND	ND	ND	NT
p/m-Xylene	0.26	100	500	1000	0.37	0.84	0.11 J	0.00084 J	0.27	0.0053	NT
o-Xylene	0.26	100	500	1000	0.24	0.54	0.12	0.0029	0.14	0.0032	NT
Acetone	0.05	100	500	1000	0.35 J	0.82	ND	0.033	0.59 J	0.088	NT
2-Butanone	0.12	100	500	1000	ND	0.22 J	ND	ND	ND	0.0084 J	NT
n-Butylbenzene	12	100	500	1000	0.41	0.67	0.25	0.003	0.19	0.00082 J	NT
sec-Butylbenzene	11	100	500	1000	0.13	0.26	0.097	0.0023	0.062	0.00063 J	NT
tert-Butylbenzene	5.9	100	500	1000	0.034 J	0.028 J	0.018 J	0.0006 J	0.017 J	0.00016 J	NT
Isopropylbenzene	NV	NV	NV	NV	0.1	0.18	0.021 J	0.00081 J	0.034 J	0.00037 J	NT
p-Isopropyltoluene	NV	NV	NV	NV	0.18	0.11	0.14	0.00025 J	0.095	0.00062 J	NT
Naphthalene	12	100	500	1000	6.7	2.6	0.13 J	ND	2.1	0.012	NT
n-Propylbenzene	3.9	100	500	1000	0.41	0.52	ND	0.0019	0.09	0.00087 J	NT
1,2,4-Trichlorobenzene	NV	NV	NV	NV	ND	0.028 J	ND	ND	ND	ND	NT
1,3,5-Trimethylbenzene	8.4	47	190	380	1.4	0.75	0.14	0.00058 J	0.44	0.0053	NT
1,2,4-Trimethylbenzene	3.6	47	190	380	4	5.2	0.67	0.0045	1	0.013	NT
Methyl Acetate	NV	NV	NV	NV	0.58	0.28	0.069 J	0.012	0.66	0.014	NT
Cyclohexane	NV	NV	NV	NV	0.037 J	0.041 J	ND	ND	ND	ND	NT
Methyl cyclohexane	NV	NV	NV	NV	0.089 J	0.15 J	0.12 J	ND	0.056 J	ND	NT
Semivolatile Organics by GC/MS (mg/kg)											
Acenaphthene	20	100	500	1000	1.5	2.2	NT	ND	1.2	0.3	8.1
Fluoranthene	100	100	500	1000	11	5.2	NT	0.36 J	11	2.5	37
Naphthalene	12	100	500	1000	3.4	2.1	NT	ND	1.4	0.32	4.6
NDPA/DPA	NV	NV	NV	NV	0.28 J	ND	NT	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	NV	NV	NV	NV	1.1	ND	NT	2.8	ND	0.42	ND
Benzo(a)anthracene	1	1	5.6	11	4.9	2.3	NT	0.29 J	6.2	1.2	18
Benzo(a)pyrene	1	1	1	1.1	3.8	2.3	NT	ND	4.1	1.2	16
Benzo(b)fluoranthene	1	1	5.6	11	5.1	3.4	NT	0.36 J	5.8	1.6	20
Benzo(k)fluoranthene	0.8	1	56	110	1.6	0.91	NT	ND	2.1	0.54	6.7
Chrysene	1	1	56	110	4.4	2.4	NT	0.31 J	4.8	1.1	16
Acenaphthylene	100	100	500	1000	0.53 J	ND	NT	ND	0.81	0.11 J	0.2 J
Anthracene	100	100	500	1000	3.2	1.8	NT	0.66 U	3.4	0.62	14
Benzo(ghi)perylene	100	100	500	1000	2	1.6	NT	0.18 J	2.4	0.89	9.7
Fluorene	30	100	500	1000	2.8	3.2	NT	ND	2.2	0.43	10
Phenanthrene	100	100	500	1000	14	9.2	NT	0.2 J	12	2.6	45 E

Table 2
Soil Analytical Sample Summary Table
140 Chandler Street, Buffalo, New York

LOCATION	UUSCO	RRUSCO	CUSCO	IUSCO	SB1 (2-5)	SB8 (2.5-6.5')	SB14 (3-4')	TP3 (1-2.5')	SB3 (1-4')	SB4 (0-4')	SB12 (0-3')
SAMPLING DATE					5/20/2019	5/20/2019	5/20/2019	5/20/2019	5/20/2019	5/20/2019	5/20/2019
LAB SAMPLE ID					L1921330-01	L1921330-02	L1921330-03	L1921330-07	L1921330-08	L1921330-09	L1921330-10
Semivolatile Organics by GC/MS (mg/kg)											
Dibenzo(a,h)anthracene	0.33	0.33	0.56	1.1	0.53 J	0.36 J	NT	ND	0.79	0.18	2.6
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	11	2.1	1.6	NT	0.18 J	2.8	0.8	9.7
Pyrene	100	100	500	1000	8.1	4.5	NT	0.37 J	8.8	2	29
Biphenyl	NV	NV	NV	NV	0.37 J	ND	NT	2.5 U	0.26 J	0.06 J	0.9 J
Dibenzofuran	7	14	350	1000	1.9	1.5	NT	1.1 U	1.4	0.26	6.8
2-Methylnaphthalene	NV	NV	NV	NV	1.6	11	NT	1.3 U	0.84 J	0.19 J	2.8
Phenol	0.33	100	500	1000	ND	ND	NT	ND	ND	0.078 J	ND
3-Methylphenol/4-Methylphenol	0.33	34	500	1000	ND	0.44 J	NT	ND	0.32 J	0.06 J	0.18 J
Carbazole	NV	NV	NV	NV	1.6	0.63 J	NT	ND	1.4	0.31	6.7
Total Metals (mg/kg)											
Aluminum, Total	NV	NV	NV	NV	5460	6830	NT	7690	7050	5190	5650
Antimony, Total	NV	NV	NV	NV	4.09 J	3.54 J	NT	1.14 J	1.59 J	1.11 J	1.04 J
Arsenic, Total	13	16	16	16	3.62	13.7	NT	5.5	4.33	5.47	7.08
Barium, Total	350	350	400	10000	74.8	219	NT	116	71.6	62.5	128
Beryllium, Total	7.2	14	590	2700	0.294 J	0.586	NT	0.39 J	0.403 J	0.33 J	0.494 J
Cadmium, Total	2.5	2.5	9.3	60	0.513 J	1.56	NT	0.78 J	0.867 J	0.537 J	0.673 J
Calcium, Total	NV	NV	NV	NV	96700	30500	NT	134000	50800	120000	61700
Chromium, Total	NV	NV	NV	NV	11.4	20.3	NT	13.9	27.9	44.2	12.6
Cobalt, Total	NV	NV	NV	NV	2.61	8.6	NT	5.45	3.83	2.77	4.45
Copper, Total	50	270	270	10000	29.9	116	NT	56.6	33.7	20.8	57.4
Iron, Total	NV	NV	NV	NV	7620	20900	NT	14800	23400	10400	13100
Lead, Total	63	400	1000	3900	61.3	306	NT	36.8	63	78.2	60.7
Magnesium, Total	NV	NV	NV	NV	22000	7440	NT	13600	6020	14400	13000
Manganese, Total	1600	2000	10000	10000	270	350	NT	449	1710	1040	272
Mercury, Total	0.18	0.81	2.8	5.7	0.312	0.186	NT	0.083 U	0.057 J	0.174	0.177
Nickel, Total	30	140	310	10000	8.31	25	NT	14.9	14.3	9.22	12.8
Potassium, Total	NV	NV	NV	NV	653	998	NT	1060	962	631	698
Selenium, Total	3.9	36	1500	6800	0.56 J	0.986 J	NT	0.612 J	0.272 J	0.568 J	0.663 J
Silver, Total	2	36	1500	6800	ND	ND	NT	ND	ND	ND	ND
Sodium, Total	NV	NV	NV	NV	244	189	NT	153 J	510	240	191 J
Thallium, Total	NV	NV	NV	NV	1.9 U	1.86 U	NT	ND	0.666 J	ND	ND
Vanadium, Total	NV	NV	NV	NV	11.4	21.4	NT	15.6	15.7	24.3	16.8
Zinc, Total	109	2200	10000	10000	116	413	NT	113	122	127	96.9
Polychlorinated Biphenyls by GC (mg/kg)											
Aroclor 1254	0.1	1	1	25	ND	ND	NT	ND	ND	0.118	0.0089 J
PCBs, Total	0.1	1	1	25	ND	ND	NT	ND	ND	0.118	0.0173 J

Notes:

1. Analytical testing performed by Alpha Analytical. Compounds detected in one or more samples are presented in this table. Refer to Appendix for the full analytical report.
2. ug/kg = parts per billion; mg/kg = parts per million.
3. ND = not detected; NT = not tested; NV = no value.
4. Analytical results compared to NYSDEC Part 375-6; Remedial Program Soil Cleanup Objectives, Table 375-(a) Unrestricted Use Soil Cleanup Objective; and Table 375-6.8(b): Restricted Use Soil Cleanup Objectives.
5. Shading indicates:
   - Exceeds NY-UUSCO: New York NYCRR Part 375 New York Unrestricted Use Soil Cleanup Objectives.
   - Exceeds NY-RUSCO: New York NYCRR Part 375 New York Restricted Residential Use Soil Cleanup Objectives.
   - Exceeds NY-CUSCO: New York NYCRR Part 375 Commercial Use Soil Cleanup Objectives.
   - Exceeds NY-IUSCO: New York NYCRR Part 375 Industrial Use Soil Cleanup Objectives.

Table 3
Groundwater Analytical Testing Results Summary
140 Chandler Street, Buffalo, New York

LOCATION	Class GA Criteria	SB1	SB10	SB13
SAMPLING DATE		5/20/2019	5/20/2019	5/20/2019
LAB SAMPLE ID		L1921330-04	L1921330-05	L1921330-06
Volatile Organics by GC/MS (ug/l)				
Methylene chloride	5	0.92 J	ND	ND
1,1-Dichloroethane	5	0.89 J	ND	ND
Benzene	1	0.64	ND	2.5
Toluene	5	1.2 J	ND	5
Ethylbenzene	5	0.89 J	ND	ND
Chloromethane	NV	2.1 J	ND	ND
Trichloroethene	5	0.36 J	ND	ND
1,2-Dichlorobenzene	3	3.8	ND	ND
Methyl tert butyl ether	10	ND	ND	7.7
p/m-Xylene	5	3.5	ND	1.6 J
o-Xylene	5	2.9	ND	1.1 J
Acetone	50	170	4.9 J	4.4 J
2-Butanone	50	5.6	ND	ND
2-Hexanone	50	1.1 J	ND	ND
n-Butylbenzene	5	0.8 J	ND	ND
Isopropylbenzene	5	0.78 J	ND	ND
p-Isopropyltoluene	5	0.73 J	ND	ND
Naphthalene	10	27	2.6	0.87 J
n-Propylbenzene	5	2 J	ND	ND
1,3,5-Trimethylbenzene	5	9.8	ND	ND
1,2,4-Trimethylbenzene	5	22	ND	0.86 J
Cyclohexane	NV	0.45 J	0.29 J	1.1 J
Methyl cyclohexane	NV	ND	ND	1.1 J
Semivolatile Organics (ug/l)				
Biphenyl	NV	1.8 J	ND	ND
Dibenzofuran	NV	6.7	ND	ND
Phenol	1	5	ND	ND
3-Methylphenol/4-Methylphenol	NV	3.6 J	ND	2.9 J
Carbazole	NV	11	0.92 J	0.74 J
Acenaphthene	20	6.2	0.63	0.3
Fluoranthene	50	16	0.62	0.34
Naphthalene	10	35	0.78	0.38
Benzo(a)anthracene	0.002	4.8	0.15	0.1
Benzo(a)pyrene	0	3.2	0.11	0.08 J
Benzo(b)fluoranthene	0.002	4.6	0.19	0.12
Benzo(k)fluoranthene	0.002	1.7	0.08 J	0.05 J
Chrysene	0.002	4.8	0.16	0.11
Acenaphthylene	NV	0.98	ND	ND
Anthracene	50	6.2	0.26	0.12
Benzo(ghi)perylene	NV	1.7	0.08 J	0.06 J
Fluorene	50	9.4	0.4	0.2
Phenanthrene	50	30	0.91	0.63
Dibenzo(a,h)anthracene	NV	0.43 J	ND	ND
Indeno(1,2,3-cd)pyrene	0.002	1.6	0.07 J	0.05 J
Pyrene	50	12	0.46	0.25
2-Methylnaphthalene	NV	8.8	0.18	0.18
Pentachlorophenol	1	ND	ND	0.61 J

Notes:

1. Analytical testing performed by Alpha Analytical. Compounds detected in one or more samples are presented in this table. Refer to Attachment C for the full analytical report.

2. ug/L = part per billion.

3. Analytical results compared to NYSDEC Class GA criteria obtained from the Division of Water Technical and Operational Guidance Series (TOGS 1.1.1), dated October 1993, revised June 1999, January 1999 errata sheet, and April 2000 addendum.

4. ND= Non-Detect; NV= No value.

5. Yellow shading indicates exceedance of NYSDEC Class GA Criteria.

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Boring No: SB1

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	4 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	2.45 feet	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown f/c Sand, some Gravel, little Silt, tr. Brick, tr. Concrete, tr. Cinders, moist (FILL)	
1					ND
				Grades to:… some Silt & Clay	
2					4
				Grades to:… some Brick, odor	
3					22
				Brown Clay & Silt, and Brick, little Gravel, trace f. Sand, moist (FILL)	
4	2	4-8	65		22
				Brown f/c Sand, and Gravel, little Silt, saturated, sheen & odor (FILL)	
5					8
6				Grades to:… Dk. brown, some Clay & Silt, little Wood, stained	8
7					ND
				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	
8	3	8-12	75		ND
9					ND
10					ND
11					ND
12					ND
				Bottom of Boring - 12 feet below grade	
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

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Boring No: SB2

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	3 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown f/c Sand, some Gravel, little Silt (FILL)	
1					0
				Grades to:… some Brick	
2					0
				Brown Clay & Silt, trace f. Sand, trace Gravel, saturated (FILL)	
3					2.5
				Brown f/c Sand, some Gravel, little Wood, trace Cinders, wet	
4					2.5
				Bottom of Boring - 4 feet below grade	
5				Spoon Refusal - potential former	
				foundation	
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB3

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	5 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown f/c Sand, some Gravel, little Silt, trace Concrete, moist (FILL)	
1					1.5
2					1.5
				Dk. brown Clay & Silt, trace f. Sand, trace Gravel (FILL)	
3					13
				Grades to:… stained	
4	2	4-8	75		13
				Brown f/c Sand, some Gravel, little Silt, wet (FILL)	
5					ND
				Grades to:… saturated	
6					ND
				Concrete floor	
7				Dk. brown sub-base Gravel, wet	ND
				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB4

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	50	Brown f/c Sand, some Gravel, little Silt, trace Concrete, moist (FILL)	
1					ND
2				Brown Clay & Silt, little f/c Sand, little Gravel, moist	5
3				Grades to:… stained	5
4	2	4-8	0		5
5					
6					
7					
8	3	8-12	85	Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	ND
9					ND
10					ND
11					ND
12					ND
				Bottom of Boring - 12 feet below grade	
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB5

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown f/c Sand, little Gravel, little Silt, moist (FILL)	
1					ND
2				Brown Clay & Silt, trace f. Sand, trace Gravel, moist (FILL)	ND
3					ND
4	2	4-8	75	Grades to:… Dk. brown, trace Glass	ND
5				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel	ND
6					ND
7					ND
8	3	8-12	85		ND
9					ND
10					ND
11					ND
12					ND
				Bottom of Boring - 12 feet below grade	
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB6

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown f/c Sand, little Concrete, little Gravel, moist (FILL)	
1				Grades to:… little Cinders, trace Concrete	1
2					ND
3					ND
				Brown Clay & Silt, trace f. Sand, trace Gravel, moist (FILL)	
4	2	4-8	85		ND
5				Brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	ND
6					ND
7					ND
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB7

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	40	Brown f/c Sand, some Gravel, trace Silt, trace Brick, moist (FILL)	
1					0
				Grades to:… some Brick	
2					10
				Brown Clay & Silt, and Brick, little Concrete, little f/c Sand, moist (FILL)	
3					10
				Grades to:… Dk. brown, trace Wood, odor & stained	
4					10
				Bottom of Boring - 4.5 feet below grade	
5				Spoon Refusal - potential former	
				foundation	
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB8

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	6.5 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	45	Brown f/c Sand, some Gravel, little Silt, trace Asphalt (FILL)	
1					ND
				Brown Clay & Silt, little f/c Sand, little Gravel, trace Wood, moist (FILL)	
2					5
				Grades to:… little Wood, odor & stained	
3					10
				Grades to:… little Concrete, odor & stained	
4	2	4-8	45		20
				Grades to:… trace Concrete, odor & stained	
5					8
6					4
				Grades to:… wet	
7				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	ND
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB9

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	75	Brown Clay & Silt, some Gravel, little Concrete, trace f/c Sand, moist (FILL)	
1					ND
				Grades to:… little Gravel, little Brick	
2					ND
				Grades to:… some Brick	
3					ND
				Grades to:… little Brick	
4	2	4-8	85		4
5					4
6				Red/brown CLAY & SILT, trace fc Sand, trace Gravel, moist	ND
7					ND
8					ND
9				Bottom of Boring - 8 feet below grade	
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB10

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	5 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	2.7 feet	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Gray crushed Concrete, some Gravel, trace f/c Sand, moist (FILL)	
1				Brown Clay & Silt, trace f. Sand, trace Gravel, moist (FILL)	ND
2					ND
3				Grades to:… trace Cinders	ND
4	2	4-8	85		ND
5				Grades to:… little f. Sand, wet	ND
6				Red/brown CLAY & SILT, trace fc Sand, trace Gravel, moist	ND
7					ND
8					ND
9				Bottom of Boring - 8 feet below grade	
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

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Boring No: SB11

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	4.5 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown Clay & Silt, trace f. Sand, trace Gravel, moist (FILL)	
1					ND
				Grades to:… little Gravel, little f/c Sand	
2					ND
3					ND
				Grades to:… some Gravel, some f/c Sand	
4	2	4-8	75	Grades to:… some Concrete	ND
				Grades to:… wet	
5				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	ND
6					ND
7					ND
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

WITTMAN GeoSciences, PLLC
3636 N. Buffalo Road
Orchard Park, NY 14127
michelewittmangeo@gmail.com
716-574-1513

Boring No: SB12

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown Silt & Clay, some f/c Sand, little Gravel, moist (FILL)	
1					ND
				Grades to:… Dk. brown, some Cinders	
2					ND
3				Grades to:… trace Cinders, trace Wood	ND
4	2	4-8	85		ND
				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	
5					ND
6					ND
7					ND
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

WITTMAN GeoSciences, PLLC
3636 N. Buffalo Road
Orchard Park, NY 14127
michelewittmangeo@gmail.com
716-574-1513

Boring No: SB13

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	4.5 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	0.9 feet	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown f/c Sand, some Silt, little Gravel, moist (FILL)	
1					ND
				Brown Clay & Silt, little f/c Sand, little Gravel, trace Cinders, moist (FILL)	
2					ND
3					ND
				Grades to:… trace f. Sand, trace Gravel	
4	2	4-8	85		ND
5				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, saturated	ND
6					ND
7					ND
8	3	8-12	100		ND
9					ND
10					ND
11					ND
12					ND
				Bottom of Boring - 12 feet below grade	
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

WITTMAN GeoSciences, PLLC
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Orchard Park, NY 14127
michelewittmangeo@gmail.com
716-574-1513

Boring No: SB14

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	2 feet	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	25	Brown f/c Sand, some Gravel, trace Concrete, trace Silt (FILL)	
1					1
2					1
				Grades to:… some Clay & Silt, wet	
3					10
				Brown Clay & Silt, trace f. Sand, trace Gravel, moist, odor (FILL)	
4	2	4-8	85		40
5				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	ND
6					ND
7					ND
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

WITTMAN GeoSciences, PLLC
3636 N. Buffalo Road
Orchard Park, NY 14127
michelewittmangeo@gmail.com
716-574-1513

Boring No: SB15

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	75	Brown f/c Sand, some Gravel, little Silt, trace Concrete, moist (FILL)	
1					ND
2					ND
3					ND
				Brown Clay & Silt, trace f. Sand, trace Gravel, moist (FILL)	
4	2	4-8	85	Grades to:… wet	ND
5				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	ND
6					ND
7					ND
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

WITTMAN GeoSciences, PLLC
3636 N. Buffalo Road
Orchard Park, NY 14127
michelewittmangeo@gmail.com
716-574-1513

Boring No: SB16

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Drilling Contractor	Trec Environmental
GW Depth While Drilling	NWWD	Type of Drill Rig	Track Mounted Geoprobe
GW Depth at Completion	NWAC	Sampler Type:	MC

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
	1	0-4	65	Brown f/c Sand, some Gravel, trace Concrete, trace Silt, moist (FILL)	
1					ND
2					ND
3					ND
				Brown Clay & Silt, little f. Sand, trace Gravel, moist (FILL)	
4	2	4-8	85		ND
5				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist	ND
6					ND
7					ND
8					ND
				Bottom of Boring - 8 feet below grade	
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

Test Pit No: TP1

Project Name & Location	140 Chandler, Buffalo, NY			WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211			WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019	End Date	5/20/2019	Contractor	Lazarus Ind.
GW Depth in Excavation	NWAC			Equipment	Excavator

Sample Depth (ft)	Sample No.	Sample Depth (feet)	OVM Reading (ppm)	SAMPLE DESCRIPTION
	1	0-2.5	ND	Gray crushed Concrete, some Gravel, trace f/c Sand, moist (FILL)
1				Brown Clay & Silt, trace f. Sand, trace full Brick, trace Metal pieces (FILL)
			ND	
2				
	2	2.5-5.5	ND	
3				
			ND	
4				
			ND	
5				
			ND	Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist
6				Bottom of Excavation - 5.5 feet below grade
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:	1) Organic vapor meter used to field screen and headspace soil samples 2) ND = non detect on the OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of excavation. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

Test Pit No: TP2

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Contractor	Lazarus Ind.
GW Depth in Excavation	NWAC	Equipment	Excavator

Sample Depth (ft)	Sample No.	Sample Depth (feet)	OVM Reading (ppm)	SAMPLE DESCRIPTION
	1	0-2	4.4	Brown f/c Sand and Gravel, some Cobbles, little Silt, moist
1				
			4.4	
2	2	2-4		Grades to:… wet
			2.2	Grades to:… Dk. brown, saturated
3				
			2.2	
4				
				Bottom of Excavation - 4 feet below grade
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:	1) Organic vapor meter used to field screen and headspace soil samples 2) ND = non detect on the OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of excavation. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

Test Pit No: TP3

Project Name & Location	140 Chandler, Buffalo, NY	WGS Representative:	E. Betzold/HEI
WGS Project Number:	19211	WGS Reviewed & Approved by:	M. Wittman, P.G.
Start Date	5/20/2019 End Date 5/20/2019	Contractor	Lazarus Ind.
GW Depth in Excavation		Equipment	Excavator

Sample Depth (ft)	Sample No.	Sample Depth (feet)	OVM Reading (ppm)	SAMPLE DESCRIPTION
	1	0-1	ND	Brown Clay & Silt, little f. sand, little Gravel, moist (FILL)
1	2	1-2.5		
			16	Grades to:… Dk. brown, odor & stained
2				
	2	2.5-4	16	
3				Grades to:… Red/brown, no odor & no staining
			ND	
4				Red/brown CLAY & SILT, trace f/c Sand, trace Gravel, moist
				Bottom of Excavation - 4 feet below grade
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:	1) Organic vapor meter used to field screen and headspace soil samples 2) ND = non detect on the OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of excavation. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

APPENDIX B

SITE PHOTOGRAPHS

<table>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>1.</td><td>On-site debris to be removed</td><td>2.</td><td>On-site debris to be removed</td></tr>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>3.</td><td>On-site debris to be removed</td><td>4.</td><td>Interior tank with unknown material</td></tr>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>5.</td><td>Unknown material within interior tank</td><td>6.</td><td>Miscellaneous containers with unknown material</td></tr>
</table>

			
7.	Interior on-site tank	8.	Petroleum staining on concrete floor near on-site tank
			
9.	Petroleum material on exterior of on-site tank	10.	On-site tank
			
11.	On-site tank (note: photo taken from second floor)	12.	On-site former mixing tank

APPENDIX C

PRE-RENOVATION/DEMOLITION ASBESTOS SURVEY

Pre-Renovation / Demolition Asbestos Inspection Report

Project Location:

140 - 150 Chandler Street
Buffalo, NY 14207

Project ID: 19-1106JD-A

Conditions as of: November 6, 2019

Prepared for:

Rocco Termini
Signature Development
391 Washington Street, Suite 1
Buffalo, NY 14203

Prepared by:

AMD Environmental Consultants, Inc.
712 Main St. Suite L1
Buffalo, NY 14202
OFFICE (716) 833-0043 | FAX (716) 241-8689
www.amdenvironmental.com

AMD Environmental Consultants, Inc.
712 Main St. Suite L1
Buffalo, NY 14202
Office: 716 833-0043 Fax: 716 241-8689
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November 11, 2019

Rocco Termini
Signature Development
391 Washington Street, Suite 1
Buffalo, NY 14203

Re: Pre-Renovation/Demolition Asbestos Inspection Report
140 – 150 Chandler Street
Buffalo, NY 14207
AMD Project ID: 19-1106JD-A

Mr. Termini:

I am pleased to present this summary of asbestos survey services at the above referenced address.

AMD Environmental Consultants conducted a pre-renovation/demolition asbestos inspection, at the above referenced address on November 6th, 2019. Asbestos containing materials (ACM) were identified above 1% in materials that were sampled. For more detail refer to the summary on page 4.

New York State asbestos regulations (12 NYCRR 56-5) require that asbestos surveys are conducted in order to determine whether or not the building or structure, or portion(s) thereof to be demolished, renovated, remodeled, contains asbestos containing building materials (ACBM), or presumed asbestos containing materials (PACM). These regulations also require that a copy of the pre-renovation survey be forwarded to the local New York State Department of Labor (NYSDOL) Asbestos Control Bureau immediately upon completion of the survey (Buffalo Office: 65 Court Street, Rm. 405, Buffalo, NY 14202). **If requested to AMD in writing, a copy of the survey will be submitted on your behalf to the NYSDOL, otherwise a copy must be submitted by the owner.**

AMD Environmental Consultants, Inc. surveys are intended to determine, to a reasonable extent, the presence, location, quantity, and condition of accessible asbestos containing materials (surfacing, thermal systems insulation, and miscellaneous materials). The information contained herein is representative of conditions found onsite during the date/time this survey was conducted. Environmental conditions, renovation, vandalism, etc. may alter conditions from the date/time that this survey was conducted, potentially creating new hazards.

Please do not hesitate to contact me if I may provide any additional information.

Sincerely,

Anthony DeMiglio
President

AMD Environmental Consultants, Inc.
712 Main St. Suite L1
Buffalo, NY 14202
Office: 716 833-0043 Fax: 716 241-8689
www.amdenvironmental.com

Table of Contents

AMD Environmental Consultants, Inc.
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Buffalo, NY 14202
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1.0 Asbestos Inspection

1.1 Introduction

AMD Environmental Consultants, Inc (AMD) was retained by Signature Development to inspect the buildings located at 140 – 150 Chandler Street in Buffalo, NY for the presence of materials suspected of containing asbestos in areas of planned renovations.

AMD was assigned to:

- Locate suspect asbestos containing materials (ACM),
- Sample these materials to determine asbestos content, and
- Identify the locations and estimated quantities of the confirmed asbestos containing materials.

The information following this introduction details the amount of asbestos present in this facility and the location of the ACBM (asbestos containing building materials). Although the report is a comprehensive analysis of the asbestos inspection work performed, it would be helpful to review all applicable federal, state and local rules, laws and regulations regarding the handling and treatment of ACBM.

The following is a list of suggested reading and information sources relating to asbestos:

- New York State Department of Labor Industrial Code Rule 56
- National Emission Standard for Hazardous Air Pollutants (NESHAPS)
- Occupational Safety and Health Administration
- (OSHA 1926.1101, 1910.134, 1910.1020, 1910.1200, 1910.145, 1910.95, 1926.58)
- Environmental Protection Agency rule CFR763.46 Asbestos Hazard Emergency Response Act

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1.2 Executive Summary

The scope of services included the identification of suspect asbestos containing building materials in areas of planned renovations; sampling and analysis of the suspect materials; and identifying the locations, estimated quantities, and condition of the confirmed asbestos containing materials.

Sampling and analysis of the suspect materials under Polarized Light Microscopy (PLM) ,and where necessary, under Transmission Electron Microscopy (TEM), revealed the following materials as asbestos containing building materials (ACBM):

ASBESTOS CONTAINING MATERIALS SUMMARY

Building 1 – 140 Chandler Street, Buffalo, NY

HAN	Material Description	SID (Space Identification Number)	Estimated Quantity SF*	Friability/ Condition
301	9" x 9" Floor Tile	1000	<10 Sq. Ft.	NF/D
600	Transite Stack	1005, Roof – Note 1	15 sq. ft.	F/I
702	Roof – Repair Tar	Roof	100 Sq. Ft.	NF/D

Buildings 2 and 3 – 150 Chandler Street, Buffalo, NY

HAN	Material Description	SID (Space Identification Number)	Estimated Quantity SF*	Friability/ Condition
400	Thermal System Insulation	1000 – Building 3	100 LF	F/D
401	Tank Insulation	1000 – Building 3	350 sq. ft.	F/D
600	Transite	1000, Exterior, Roof – Building 3	5,500 sq. ft.	F/D
602	Window Glaze	1000 – Building 3	30 sq. ft.	NF/D
702	Roof Repair Tar	Roof – Building 2 – Note 1	<10 sq. ft.	NF/I

*Quantities are approximate, and are only associated with areas of planned renovation. Additional asbestos containing materials may be located outside areas of planned renovation that were not surveyed, assessed or quantified during this inspection.

INSPCTION NOTES:

NOTE 1= Materials were assumed to contain asbestos based on AMD Environmental's experience on similar projects and must be managed as such until proven otherwise.

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KEY TERMS AND DEFINITIONS:

HAN= Homogenous Area Number; number assigned to categorize materials of like composition, texture and appearance

SID=Space Identification Number: Sample Locations

Friability/Condition:

F= Friable: a material that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure, or is capable of being released into the air by hand pressure.

NF= Non Friable: a material that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure, or is incapable of being released into the air by hand pressure.

I= Intact: Asbestos material that has not crumbled, been pulverized, or otherwise been damaged or disturbed, and the material's matrix has not noticeably deteriorated.

D= Damaged: Asbestos material that has deteriorated or sustained physical injury demonstrated by separation of the ACM into layers, separation of the ACM from the substrate, flaking, blistering, crumbling, water damage, scrapes, gouges, or other signs of physical injury.

SD=Significantly Damaged: Damaged asbestos where the damage is extensive and severe.

ACM=Asbestos Containing Material: material analyzed and confirmed by laboratory to contain above 1% of asbestos

PACM= Presumed Asbestos Containing Material: this material was assumed to contain asbestos to either save the client on lab fees or because the material was adhered to another asbestos containing material (or adjacent to other materials needing abatement) and must be managed as such.

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1.3 Purpose

The purpose of the asbestos inspection was to identify and quantify the types of asbestos containing building materials (ACBM) in the building. Samples of the suspect materials were collected for analysis by an independent laboratory, and the condition of each material noted in relation to its potential to be disturbed. The potential for fiber release was also considered.

The report is generated for the exclusive use of Signature Development and its representatives or agents, and is not designed to serve as a specification for abatement. Before requesting bids for abatement of materials identified in this report, the owner is strongly encouraged to contract with a consultant to provide this valuable service. A specification assures that all contractors are bidding on the same methodology and following the specific requirements for the work to be performed.

The inspection was conducted by NYS DOL Certified Asbestos Inspectors John Doucette and David Batt on November 6th, 2019 and revealed the following suspect asbestos containing building materials:

HOMOGENOUS MATERIALS & SAMPLE RESULTS

Building 1 – 140 Chandler Street

HAN	Suspect Asbestos Containing Material Description	SID (Space Identification Number)	Sample No.	ACM (Y/N)	Estimated Quantity SF*	Friability/ Condition
101	Drywall	1000, 1001, 1002	101-1, 101-2	No	N/A	N/A
101A	Joint Compound	1000, 1001, 1002	101A-1, 101A-2	No	N/A	N/A
102	Lightweight Stucco	1001, 1005	102-1, 102-2, 102-3	No	N/A	N/A
300	Blue Flooring	1001	300-1, 300-2	No	N/A	N/A
301	**9” x 9” Floor Tile**	**1000**	**301-1, 301-2**	**Yes**	**<10 Sq. Ft.**	**NF/D**
301A	Mastic of 9” x 9” Floor Tile	1000	301A-1, 301A-2	No	N/A	N/A
600	**Transite Stack**	**1005, Roof**	**Sample Not Submitted – See Note 1**	**Yes**	**15 Sq. Ft**	**F/I**
700	Roof – Field	Roof	700-1, 700-2	No	N/A	N/A
701	Roof – Flashing	Roof	701-1, 701-2	No	N/A	N/A
702	**Roof – Repair Tar**	**Roof**	**702-1, 702-2**	**Yes**	**100 Sq. Ft.**	**NF/D**

HOMOGENOUS MATERIALS & SAMPLE RESULTS (Continued on next page)

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Buffalo, NY 14202
Office: 716 833-0043 Fax: 716 241-8689
www.amdenvironmental.com

HOMOGENOUS MATERIALS & SAMPLE RESULTS (Continued)

Building 2 and 3 – 150 Chandler Street

HAN	Suspect Asbestos Containing Material Description	SID (Space Identification Number)	Sample No.	ACM (Y/N)	Estimated Quantity SF*	Friability/ Condition
100B	Base Plaster	1000 – Building 3	100B-1, 100B-2, 100B-3	No	N/A	N/A
400	**Thermal System Insulation**	**1000 – Building 3**	**400-1, 400-2, 400-3**	**Yes**	**100 LF.**	**F/D**
401	**Tank Insulation**	**1000 – Building 3**	**401-1, 401-2, 401-3**	**Yes**	**350 sq. ft.**	**F/D**
600	**Transite**	**1000, Exterior, Roof – Building 3**	**600-1, 600-2**	**Yes**	**5,500 sq. ft.**	**F/D**
601	Parging on Vessels	1000 – Building 3	601-1, 601-2, 601-3	No	N/A	N/A
602	**Window Glaze**	**1000**	**602-1. 602-2**	**Yes**	**30 sq. ft.**	**NF/D**
700	Roof - Field – Building 2	Roof – Building 2	700-1, 700-2	No	N/A	N/A
701	Roof – Flashing – Building 2	Roof – Building 2	701-1, 701-2	No	N/A	N/A
702	**Roof – Repair Tar – Building 2**	**Roof – Building 2**	**Sample not submitted – See note 1**	**Yes**	**<10 sq. ft.**	**NF/I**

*Quantities are approximate, and are only associated with areas of planned renovation. Additional asbestos containing materials may be located outside areas of planned renovation that were not surveyed, assessed or quantified during this inspection.

NOTES:
NOTE 1= Materials were assumed to contain asbestos based on AMD Environmental's experience on similar projects and must be managed as such until proven otherwise.

The above listed table provides a list of the materials that were sampled and tested for asbestos by Polarized Light Microscopy (PLM) and or Transmission Electron Microscopy (TEM), as applicable. Any sample determined to be a non-friable organically bound material (NOB), and which was found to be negative by Polarized Light Microscopy (PLM) analysis, was then analyzed by Transmission Electron Microscopy (TEM) analysis at American Science Team New York Inc. (AmeriSci) in New York, New York. AmeriSci is an ELAP Certified laboratory (ID: 11480) and conducts analysis according to EPA Method 198.1, 198.4 and 198.6. See Section 2.0 for the laboratory's analytical results.

AMD Environmental Consultants, Inc.
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www.amdenvironmental.com

1.4 Methodology

All work performed by AMD Environmental Consultants, Inc. was conducted in accordance with applicable regulations, including New York State Department of Labor standards 12NYCRR Part 56, National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Occupational Safety and Health Administration regulations 29CFR1910.1101 and 29CFR1910.134. All AMD personnel assigned to conduct inspections have completed the Environmental Protection Agency (EPA) required training and New York State Department of Labor Division of Safety and Health certification program.

Each suspect asbestos containing building material (ACBM) was assigned a homogenous area number (HAN). Homogeneous areas consist of materials of like composition, texture and appearance.

Based on the homogeneous areas, samples of suspect materials were collected. Techniques used for sample collection were designed to minimize damage to suspected areas, reduce any potential for fiber release, and ensure the safety of the inspector and building occupants. Samples were collected by AMD personnel using the following procedures:

1. The surface to be sampled was sprayed with amended water (detergent and water) as necessary

2. A plastic sample bag was held to the surface sampled

3. The sample was collected using tools appropriate to the friability of the material sampled

4. Sample bags were labeled with a unique sample identification number

5. Samples were recorded on a Chain of Custody form, and submitted under strict chain-of-custody procedures to American Science Team New York Inc. (AmeriSci) in New York, New York. AmeriSci is an ELAP and NYSDOH approved, certified laboratory for PLM and TEM analysis (ELAP ID: 11480).

Samples were first analyzed using PLM, Polarized Light Microscopy in accordance with US Environmental Protection Agency Interim Method, 40CFRPt763, Supt F, App A(7-1-87). For the sample results not considered definitive, additional analysis was performed under Transmission Electron Microscopy (TEM) in accordance with NYSDOH ELAP Item 198.4, for Non-friable Organically Bound Bulk Material (NOB). The results of these analyses confirmed whether or not a suspect materials actually contained asbestos. All materials sampled are summarized in Section 1.3 of this report; the presumed asbestos containing materials and materials containing asbestos above 1.0% are listed in Section 1.2.

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2.0 Laboratory Analytical Results

AmeriSci New York
117 EAST 30TH ST.
NEW YORK, NY 10016
TEL: (212) 679-8600 • FAX: (212) 679-3114

PLM Bulk Asbestos Report

AMD Environmental Consultants, Inc.
Attn: John Wolf
712 Main Street
Suite L1
Buffalo, NY 14202

Date Received 11/08/19 **AmeriSci Job #** 219111778
Date Examined 11/12/19 **P.O. #**
ELAP # 11480 **Page** 1 **of** 4
RE: 19-1106 JD-A; Bldg 2 - 3; 140 Chandler, NY, Bldg 2 - 3

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
100B-1 100B	219111778-01 **Location:** Bldg. 3, 1000 - Base Plaster	*No*	NAD [1] (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
100B-2 100B	219111778-02 **Location:** Bldg. 3, 1000 - Base Plaster	*No*	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
100B-3 100B	219111778-03 **Location:** Bldg. 3, 1000 - Base Plaster	*No*	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
400-1 400	219111778-04 **Location:** Bldg. 3, 1000 - Thermal Systems Insulation	*Yes*	15.4 % (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: White, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.4 % **Other Material:** Non-fibrous 84.6 %			
400-2 400	219111778-05 **Location:** Bldg. 3, 1000 - Thermal Systems Insulation		NA/PS
Analyst Description: Bulk Material **Asbestos Types:** **Other Material:**			

See Reporting notes on last page

PLM Bulk Asbestos Report

19-1106 JD-A; Bldg 2 - 3; 140 Chandler, NY, Bldg 2 - 3

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
400-3 400	219111778-06 **Location:** Bldg. 3, 1000 - Thermal Systems Insulation		NA/PS
Analyst Description: Bulk Material **Asbestos Types:** **Other Material:**			
401-1 401	219111778-07 **Location:** Bldg. 3, 1000 - Tank Insulation	***Yes***	23.5 % (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 23.5 % **Other Material:** Non-fibrous 76.5 %			
401-2 401	219111778-08 **Location:** Bldg. 3, 1000 - Tank Insulation		NA/PS
Analyst Description: Bulk Material **Asbestos Types:** **Other Material:**			
401-3 401	219111778-09 **Location:** Bldg. 3, 1000 - Tank Insulation		NA/PS
Analyst Description: Bulk Material **Asbestos Types:** **Other Material:**			
600-1 600	219111778-10 **Location:** Bldg. 3, 1000 - Transite	***Yes***	20 % (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Fibrous, Cementitious, Bulk Material **Asbestos Types:** Chrysotile 20.0 % **Other Material:** Non-fibrous 80 %			
600-2 600	219111778-11 **Location:** Bldg. 3, 1000 - Transite		NA/PS
Analyst Description: Bulk Material **Asbestos Types:** **Other Material:**			

See Reporting notes on last page

PLM Bulk Asbestos Report

19-1106 JD-A; Bldg 2 - 3; 140 Chandler, NY, Bldg 2 - 3

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
601-1 601	219111778-12 **Location:** Bldg. 3, 1000 - Parging On Vessels	***No***	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 4 %, Non-fibrous 96 %			
601-2 601	219111778-13 **Location:** Bldg. 3, 1000 - Parging On Vessels	***No***	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 4 %, Non-fibrous 96 %			
601-3 601	219111778-14 **Location:** Bldg. 3, 1000 - Parging On Vessels	***No***	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 4 %, Non-fibrous 96 %			
602-1 602	219111778-15 **Location:** Bldg. 3, 1000 - Window Glaze	***Yes***	Trace (<0.25 % pc) [2] (EPA 400 PC) by Jared C. Clarke on 11/12/19
Analyst Description: Brown, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** Chrysotile <0.25 % pc **Other Material:** Non-fibrous 9.6 %			
602-2 602	219111778-16 **Location:** Bldg. 3, 1000 - Window Glaze	***Yes***	Trace (<0.25 % pc) [2] (EPA 400 PC) by Jared C. Clarke on 11/12/19
Analyst Description: Brown, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** Chrysotile <0.25 % pc **Other Material:** Non-fibrous 6.7 %			
700-1 700	219111778-17 **Location:** Bldg. 2, Roof - Roof - Field	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 1.5 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

19-1106 JD-A; Bldg 2 - 3; 140 Chandler, NY, Bldg 2 - 3

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
700-2 700	219111778-18 **Location:** Bldg. 2, Roof - Roof - Field	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 1.7 %			
701-1 701	219111778-19 **Location:** Bldg. 2, Roof - Roof - Flashing	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 1.8 %			
701-2 701	219111778-20 **Location:** Bldg. 2, Roof - Roof - Flashing	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 2.1 %			

Reporting Notes:

(1) This job was - Analyzed using Motic BA310 Pol Scope S/N 1190000326

(2) Sample prepared for analysis by ELAP 198.6 method

Analyzed by: Jared C. Clarke _____

*NAD/NSD =no asbestos detected; NA =not analyzed; NA/PS=not analyzed/positive stop, (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; PLM Bulk Asbestos Analysis by Appd E to Subpt E, 40 CFR 763 (NVLAP 200546-0), ELAP PLM Method 198.1 for NY friable samples, which includes the identification and quantitation of vermiculite or 198.6 for NOB samples or EPA 400 pt ct by Appd E to Subpt E, 40 CFR 763 (NY ELAP Lab 11480); Note:PLM is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. NAD or Trace results by PLM are inconclusive, TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos-containing in NY State (also see EPA Advisory for floor tile, FR 59,146,38970,8/1/94) National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the lab.This PLM report relates ONLY to the items tested. AIHA-LAP, LLC Lab ID 102843, RI Cert AAL-094, CT Cert PH-0186, Mass Cert AA000054.

Reviewed By:_____ _____END OF REPORT_____

AmeriSci Job #: **219111778**

Client Name: AMD Environmental Consultants, Inc.

19-1106JD-A

Table I
Summary of Bulk Asbestos Analysis Results
19-1106 JD-A; Bldg 2 - 3; 140 Chandler, NY, Bldg 2 - 3

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
01	100B-1	100B	----	----	----	----	NAD	NA
Location: Bldg. 3, 1000 - Base Plaster								
02	100B-2	100B	----	----	----	----	NAD	NA
Location: Bldg. 3, 1000 - Base Plaster								
03	100B-3	100B	----	----	----	----	NAD	NA
Location: Bldg. 3, 1000 - Base Plaster								
04	400-1	400	----	----	----	----	Chrysotile 15.4	NA
Location: Bldg. 3, 1000 - Thermal Systems Insulation								
05	400-2	400	----	----	----	----	NA/PS	NA
Location: Bldg. 3, 1000 - Thermal Systems Insulation								
06	400-3	400	----	----	----	----	NA/PS	NA
Location: Bldg. 3, 1000 - Thermal Systems Insulation								
07	401-1	401	----	----	----	----	Chrysotile 23.5	NA
Location: Bldg. 3, 1000 - Tank Insulation								
08	401-2	401	----	----	----	----	NA/PS	NA
Location: Bldg. 3, 1000 - Tank Insulation								
09	401-3	401	----	----	----	----	NA/PS	NA
Location: Bldg. 3, 1000 - Tank Insulation								
10	600-1	600	----	----	----	----	Chrysotile 20.0	NA
Location: Bldg. 3, 1000 - Transite								
11	600-2	600	----	----	----	----	NA/PS	NA
Location: Bldg. 3, 1000 - Transite								
12	601-1	601	----	----	----	----	NAD	NA
Location: Bldg. 3, 1000 - Parging On Vessels								
13	601-2	601	----	----	----	----	NAD	NA
Location: Bldg. 3, 1000 - Parging On Vessels								
14	601-3	601	----	----	----	----	NAD	NA
Location: Bldg. 3, 1000 - Parging On Vessels								
15	602-1	602	0.198	10.1	80.3	8.2	Chrysotile <0.25	Chrysotile 1.4
Location: Bldg. 3, 1000 - Window Glaze								
16	602-2	602	0.209	13.4	79.9	6.7	Chrysotile <0.25	NA/PS
Location: Bldg. 3, 1000 - Window Glaze								

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140-150 Chandler St.

See Reporting notes on last page

19-1106JD-A

Table I
Summary of Bulk Asbestos Analysis Results
19-1106 JD-A; Bldg 2 - 3; 140 Chandler, NY, Bldg 2 - 3

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
17	700-1	700	0.389	87.4	11.1	1.5	NAD	NAD
Location: Bldg. 2, Roof - Roof - Field								
18	700-2	700	0.297	81.5	16.8	1.7	NAD	NAD
Location: Bldg. 2, Roof - Roof - Field								
19	701-1	701	0.382	87.2	11.0	1.8	NAD	NAD
Location: Bldg. 2, Roof - Roof - Flashing								
20	701-2	701	0.286	81.8	16.1	2.1	NAD	NAD
Location: Bldg. 2, Roof - Roof - Flashing								

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Analyzed by: Marik Peysakhov_____; Date Analyzed 11/13/2019

**Quantitative Analysis (Semi/Full); Bulk Asbestos Analysis - PLM by Appd E to Subpt E, 40 CFR 763 or ELAP 198.1 for New York friable samples or ELAP 198.6 for New York NOB samples; TEM (Semi/Full) by EPA 600/R-93/116 (or ELAP 198.4; for New York samples; NAD = no asbestos detected during a quantitative analysis; NA = not analyzed; Trace = <1%; (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; Quantitation for beginning weights of <0.1 grams should be considered as qualitative only; Qualitative Analysis: Asbestos analysis results of "Present" or "NVA = No Visible Asbestos" represents results for Qualitative PLM or TEM Analysis only (no accreditation coverage available from any regulatory agency for qualitative analyses): NVLAP (PLM) 200546-0, NYSDOH ELAP Lab 11480, AIHA-LAP, LLC (PLM) Lab ID 102843.

Warning Note: PLM limitation, only TEM will resolve fibers <0.25 micrometers in diameter. TEM bulk analysis is representative of the fine grained matrix material and may not be representative of non-uniformly dispersed debris for which PLM evaluation is recommended (i.e. soils and other heterogenous materials).

Reviewed By:_____

100 Chandler St.

AmeriSci New York
117 EAST 30TH ST.
NEW YORK, NY 10016
TEL: (212) 679-8600 • FAX: (212) 679-3114

PLM Bulk Asbestos Report

AMD Environmental Consultants, Inc.
Attn: John Wolf
712 Main Street
Suite L1
Buffalo, NY 14202

Date Received 11/08/19 **AmeriSci Job #** 219111779
Date Examined 11/12/19 **P.O. #**
ELAP # 11480 **Page** 1 **of** 4
RE: 191106 JD-A; Bldg # 1; 140 Chandler, NY - Bldg 1

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
101-1 101	219111779-01 **Location:** 1000 - Drywall	*No*	NAD [1] (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey/Brown, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 25 %, Non-fibrous 75 %			
101-2 101	219111779-02 **Location:** 1000 - Drywall	*No*	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey/Brown, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 20 %, Non-fibrous 80 %			
101A-1 101A	219111779-03 **Location:** 1000 - Joint Compound	*No*	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
101A-2 101A	219111779-04 **Location:** 1000 - Joint Compound	*No*	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
102-1 102	219111779-05 **Location:** 1001 - Lightweight Stucco	*No*	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

191106 JD-A; Bldg # 1; 140 Chandler, NY - Bldg 1

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
102-2 102	219111779-06 **Location:** 1001 - Lightweight Stucco	***No***	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
102-3 102	219111779-07 **Location:** 1001 - Lightweight Stucco	***No***	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Grey, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
300-1 300	219111779-08 **Location:** 1001 - Blue Flooring	***No***	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Blue, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
300-2 300	219111779-09 **Location:** 1001 - Blue Flooring	***No***	NAD (by NYS ELAP 198.1) by Jared C. Clarke on 11/12/19
Analyst Description: Blue, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
301-1 301	219111779-10 **Location:** 1000 - 9 X 9 Floor Tile	***Yes***	10.2 % (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Tan, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** Chrysotile 10.2 % **Other Material:** Non-fibrous 28.1 %			
301-2 301	219111779-11 **Location:** 1000 - 9 X 9 Floor Tile		NA/PS
Analyst Description: Bulk Material **Asbestos Types:** **Other Material:**			

See Reporting notes on last page

PLM Bulk Asbestos Report

191106 JD-A; Bldg # 1; 140 Chandler, NY - Bldg 1

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
301A-1 301A	219111779-12 **Location:** 1000 - Black Mastic	***Yes***	Trace (<0.25 % pc) [2] (EPA 400 PC) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** Chrysotile <0.25 % pc **Other Material:** Non-fibrous 30 %			
301A-2 301A	219111779-13 **Location:** 1000 - Black Mastic	***Yes***	Trace (<0.25 % pc) [2] (EPA 400 PC) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** Chrysotile <0.25 % pc **Other Material:** Non-fibrous 16.8 %			
700-1 700	219111779-14 **Location:** Roof - Field Roof	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Fibrous glass 2 %, Non-fibrous 28 %			
700-2 700	219111779-15 **Location:** Roof - Field Roof	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Fibrous glass 2 %, Non-fibrous 15.6 %			
701-1 701	219111779-16 **Location:** Roof - Flashing	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Fibrous glass 2 %, Non-fibrous 30.2 %			
701-2 701	219111779-17 **Location:** Roof - Flashing	***No***	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 5.6 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

191106 JD-A; Bldg # 1; 140 Chandler, NY - Bldg 1

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
702-1	219111779-18	***Yes***	3 %
702 **Location:** Roof - Repair Tar			(by NYS ELAP 198.6) by Jared C. Clarke on 11/12/19
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material			
Asbestos Types: Chrysotile 3.0 %			
Other Material: Non-fibrous 13.3 %			
702-2	219111779-19		NA/PS
702 **Location:** Roof - Repair Tar			
Analyst Description: Bulk Material			
Asbestos Types:			
Other Material:			

Reporting Notes:

(1) This job was - Analyzed using Motic BA310 Pol Scope S/N 1190000326

(2) Sample prepared for analysis by ELAP 198.6 method

Analyzed by: Jared C. Clarke _____

*NAD/NSD =no asbestos detected; NA =not analyzed; NA/PS=not analyzed/positive stop, (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; PLM Bulk Asbestos Analysis by Appd E to Subpt E, 40 CFR 763 (NVLAP 200546-0), ELAP PLM Method 198.1 for NY friable samples, which includes the identification and quantitation of vermiculite or 198.6 for NOB samples or EPA 400 pt ct by Appd E to Subpt E, 40 CFR 763 (NY ELAP Lab 11480); Note:PLM is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. NAD or Trace results by PLM are inconclusive, TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos-containing in NY State (also see EPA Advisory for floor tile, FR 59,146,38970,8/1/94) National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the lab.This PLM report relates ONLY to the items tested. AIHA-LAP, LLC Lab ID 102843, RI Cert AAL-094, CT Cert PH-0186, Mass Cert AA000054.

Reviewed By:_____ _____END OF REPORT_____

Client Name: AMD Environmental Consultants, Inc.

19-1106JD-A

Table I
Summary of Bulk Asbestos Analysis Results
191106 JD-A; Bldg # 1; 140 Chandler, NY - Bldg 1

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
01	101-1	101	----	----	----	----	NAD	NA
Location:	1000 - Drywall							
02	101-2	101	----	----	----	----	NAD	NA
Location:	1000 - Drywall							
03	101A-1	101A	----	----	----	----	NAD	NA
Location:	1000 - Joint Compound							
04	101A-2	101A	----	----	----	----	NAD	NA
Location:	1000 - Joint Compound							
05	102-1	102	----	----	----	----	NAD	NA
Location:	1001 - Lightweight Stucco							
06	102-2	102	----	----	----	----	NAD	NA
Location:	1001 - Lightweight Stucco							
07	102-3	102	----	----	----	----	NAD	NA
Location:	1001 - Lightweight Stucco							
08	300-1	300	----	----	----	----	NAD	NA
Location:	1001 - Blue Flooring							
09	300-2	300	----	----	----	----	NAD	NA
Location:	1001 - Blue Flooring							
10	301-1	301	0.256	13.3	48.4	28.1	Chrysotile 10.2	NA
Location:	1000 - 9 X 9 Floor Tile							
11	301-2	301	0.238	13.4	49.6	37.0	NA/PS	NA
Location:	1000 - 9 X 9 Floor Tile							
12	301A-1	301A	0.293	39.2	30.7	29.9	Chrysotile <0.25	Chrysotile Trace
Location:	1000 - Black Mastic							
13	301A-2	301A	0.191	50.3	33.0	16.7	Chrysotile <0.25	Chrysotile Trace
Location:	1000 - Black Mastic							
14	700-1	700	0.420	51.4	18.6	30.0	NAD	NAD
Location:	Roof - Field Roof							
15	700-2	700	0.397	62.7	19.6	17.6	NAD	NAD
Location:	Roof - Field Roof							
16	701-1	701	0.469	54.6	13.2	32.2	NAD	NAD
Location:	Roof - Flashing							

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140-150 Chandler St.

See Reporting notes on last page

Client Name: AMD Environmental Consultants, Inc.

19-1106JD-A

Table I
Summary of Bulk Asbestos Analysis Results
191106 JD-A; Bldg # 1; 140 Chandler, NY - Bldg 1

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
17	701-2	701	0.443	84.9	9.5	5.6	NAD	NAD
Location: Roof - Flashing								
18	702-1	702	0.147	55.1	28.6	13.3	Chrysotile 3.0	NA
Location: Roof - Repair Tar								
19	702-2	702	0.236	64.8	18.2	16.9	NA/PS	NA
Location: Roof - Repair Tar								

21

Analyzed by: Khaalid W. Perine_____, Date Analyzed 11/13/2019

**Quantitative Analysis (Semi/Full); Bulk Asbestos Analysis - PLM by Appd E to Subpt E, 40 CFR 763 or ELAP 198.1 for New York friable samples or ELAP 198.6 for New York NOB samples; TEM (Semi/Full) by EPA 600/R-93/116 (or ELAP 198.4; for New York samples; NAD = no asbestos detected during a quantitative analysis; NA = not analyzed; Trace = <1%; (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; Quantitation for beginning weights of <0.1 grams should be considered as qualitative only; Qualitative Analysis: Asbestos analysis results of "Present" or "NVA = No Visible Asbestos" represents results for Qualitative PLM or TEM Analysis only (no accreditation coverage available from any regulatory agency for qualitative analyses): NVLAP (PLM) 200546-0, NYSDOH ELAP Lab 11480, AIHA-LAP, LLC (PLM) Lab ID 102843.

Warning Note: PLM limitation, only TEM will resolve fibers <0.25 micrometers in diameter. TEM bulk analysis is representative of the fine grained matrix material and may not be representative of non-uniformly dispersed debris for which PLM evaluation is recommended (i.e. soils and other heterogenous materials).

Reviewed By:_____

140-150 Chandler St.

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Buffalo, NY 14202
Office: 716-833-0043 Fax: 716-241-8689
www.amdenvironmental.com

2.1 Analytical Key Terms and Definitions

PLM: Polarized Light Microscopy; type of analysis

TEM: Transmission Electron Microscopy; secondary analysis if applicable

NOB: Non-Friable Organically Bound; materials analyzed by PLM or TEM

NAD: No asbestos detected

NA: Not applicable

PS: Positive Stop

Trace: Less than 1% asbestos (Non ACM)

ACM: Asbestos Containing Material

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3.0 Sample Chain(s) of Custody

Relinquished By: [signature] Date/Time: 11/6/19

Received By: [signature] Date/Time: 11/8/19 12:19

Relinquished By: Date/Time:

Received By: Date/Time:

19-1106JD-A

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WWW.AMERISCI.COM

BULK CHAIN OF CUSTODY

AMERISCI NEW YORK
117 EAST 30TH STREET
NEW YORK, NY 10016
TOLL FREE: (800) 705-5227
PHONE: (212) 679-8600
FAX: (212) 679-9392

AmeriSci #: 219111778

Company: AMD Environmental

Street Address: 712 Main Street, Suite L 1

City: Buffalo State: NY Zip: 14202

Phone: 716-833-0043 Cell:

Fax Results? Y ☐ Fax #:

Email Results? Y ☑ Email: to all parties listed below

Results to: jwolf@amdenv.com, anthony@amdenv.com,

Project: 140 Chandler Bldgs 2-3

Proj Mgr: Proj #: 19-1106JD-A

Proj Address: 140 Chandler Bldg 2-3 Proj State: NY

Analysis: ☐ PLM; ☒ Positive Stop; ☐ TEM; ☒ NY ELAP PLM/TEM w/ NOB Prep.

ASTM Dust ☐ (Microvac) ☐ (Wipe); ☐ Qualitative; ☐ Other (describe in comments)

Turnaround Time: 5 Day Material Type: ☒ Bulk ☐ Dust ☐ Water

Sampled By: David Batt Date Sampled: 11/6/19

Special Instructions or Comments:

admin@amdenv.com, dbatt@amdenv.com, john.doucette@amdenv.com

Lab ID	Field ID	Location	Sample Description (dust area)	Homogenous Area
24	1COB-1,2,3	Bldg. 3 1000	Base Plaster	
	400-1,2,3	Bldg. 3 1000	Thermal Systems Insulation	
	401-1,2,3	Bldg. 3 1000	Tank Insulation	
	600-1,2	Bldg. 3 1000	Transite	
	601-1,2,3	Bldg. 3 1000	Parging on Vessels	
	602-1,2	Bldg. 3 1000	Window Glaze	
	700-1,2	Bldg. 2 Roof	Roof - Field	
	701-1,2	Bldg. 2 Roof	Roof - Flashing	

140-150 Chandler St.

Relinquished By: _____ Date/Time: 11-6-19

Received By: _____ Date/Time: 11/8/19 12:19

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: _____

191106JD-A

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NEW YORK, NY 10016
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PHONE: (212) 679-8600
FAX: (212) 679-9392

AmeriSci #: 21911779

Company: AMD Environmental

Street Address: 712 Main Street, Suite L 1

City: Buffalo State: NY Zip: 14202

Phone: 716-833-0043 Cell:

Fax Results? Y ☐ Fax #:

Email Results? Y ☑ Email: to all parties listed below

Results to: jwolf@amdenv.com, anthony@amdenv.com,

Project: Bldg #1

Proj Mgr: Proj #: 191106 JD-A

Proj Address: 140 Chandler-Bldg 1 Proj State: NY

Analysis: ☐ PLM; ☐ Positive Stop; ☐ TEM; ☒ NY ELAP PLM/TEM w/ NOB Prep.

ASTM Dust ☐ (Microvac) ☐ (Wipe); ☐ Qualitative; ☐ Other (describe in comments)

Turnaround Time: 5 Day Material Type: ☒ Bulk ☐ Dust ☐ Water

Sampled By: Batt | Doucette Date Sampled: 11-6-19

Special Instructions or Comments:

admin@amdenv.com, dbatt@amdenv.com, john.doucette@amdenv.com

Lab ID	Field ID	Location	Sample Description (dust area)	Homogenous Area
	101-1, 2	1000	Dry wall	
25	101A-1, 2	1000	Joint Compound	
	102-1, 2, 3	1001	Lightweight Stucco	
	300-1, 2	1001	Blue Flooring	
	301-1, 2	1000	9x9 Floor Tile	
	301A-1, 2	1000	Black Mastic	
	700-1, 2	Roof	Field - Roof	
	701-1, 2	Roof	Flashing	
	702-1, 2	Roof	Repair Tar	

140-150 Chandler St.

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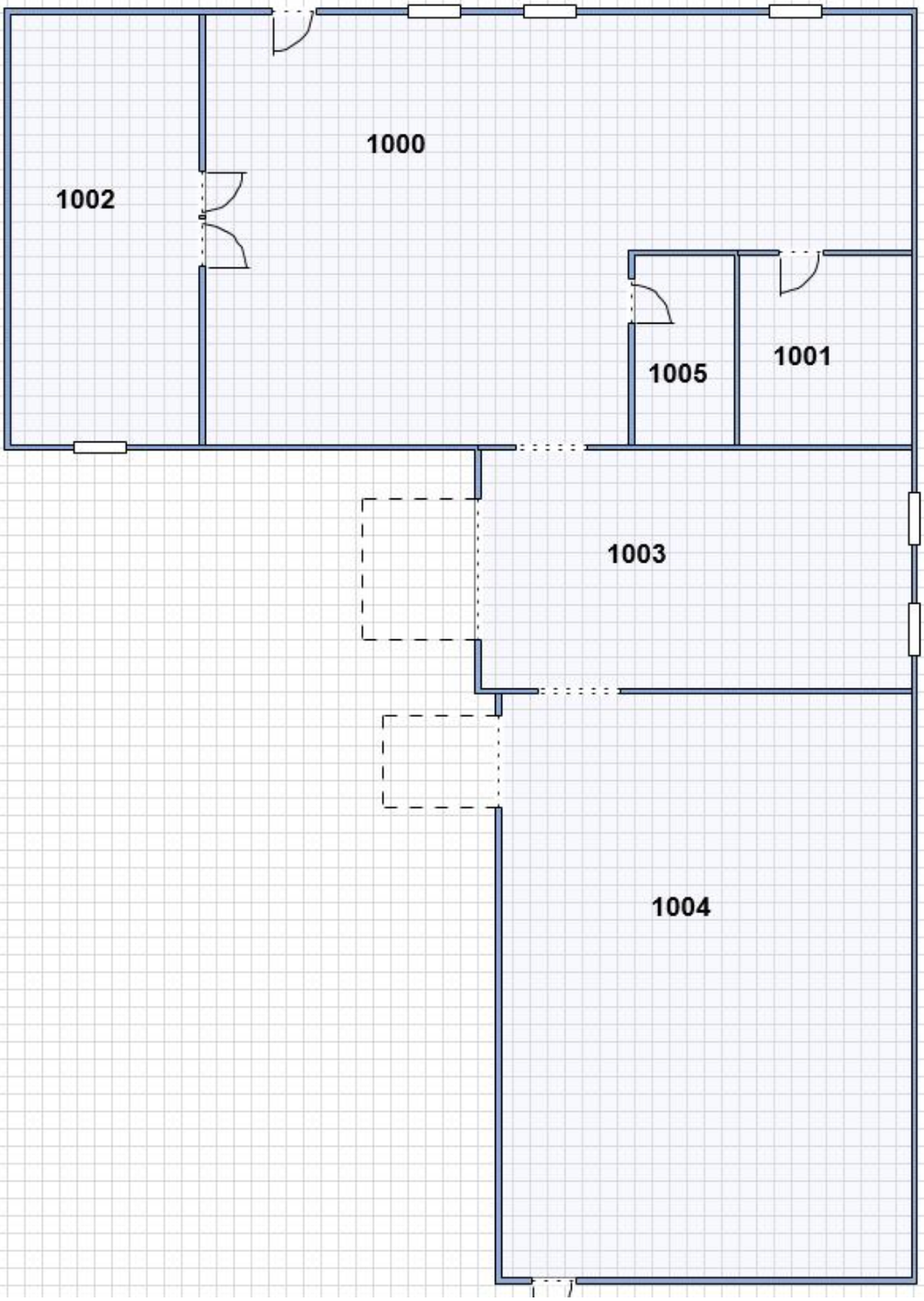
4.0 Site Map(s)

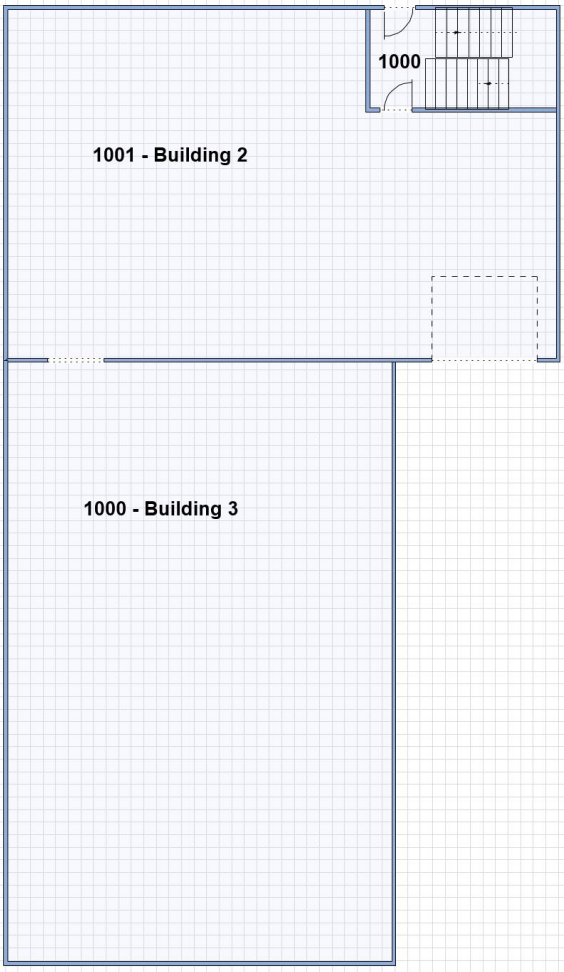
140-150 Chandler St., Buffalo, NY

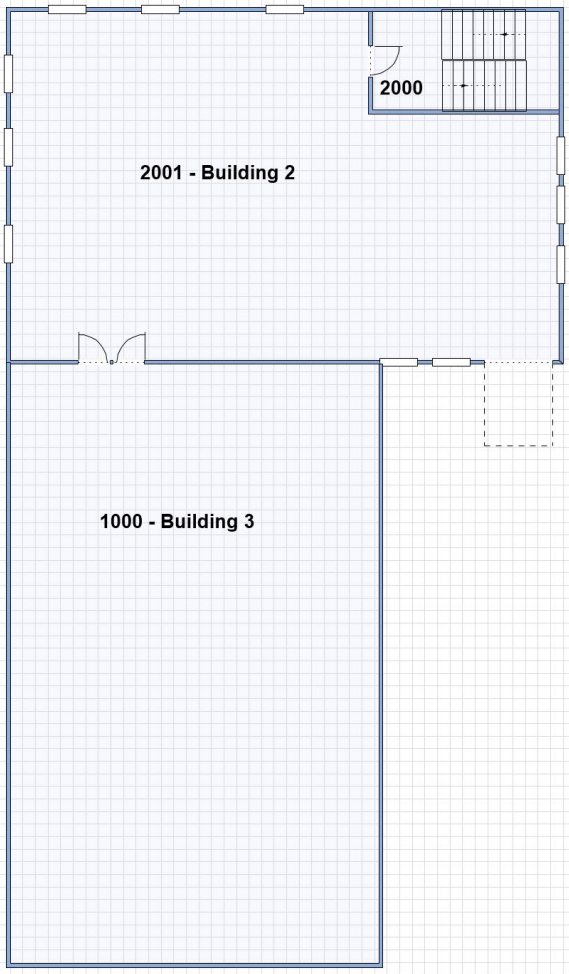
Birds Eye View of Buildings 1, 2, 3

AMD Environmental
19-1106JD-A
140 Chandler Street
Building 1
Buffalo, NY 14207



AMD Environmental
19-1106JD-A
150 Chandler Street
Buildings 2 and 3
Buffalo, NY 14207





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Appendix I

Site Photographs

Location:
Building 1Roof

Observation:
Transite stack found to contain asbestos.

Location:
Building 3

Observation:
Window Glazing Compound found to contain asbestos.

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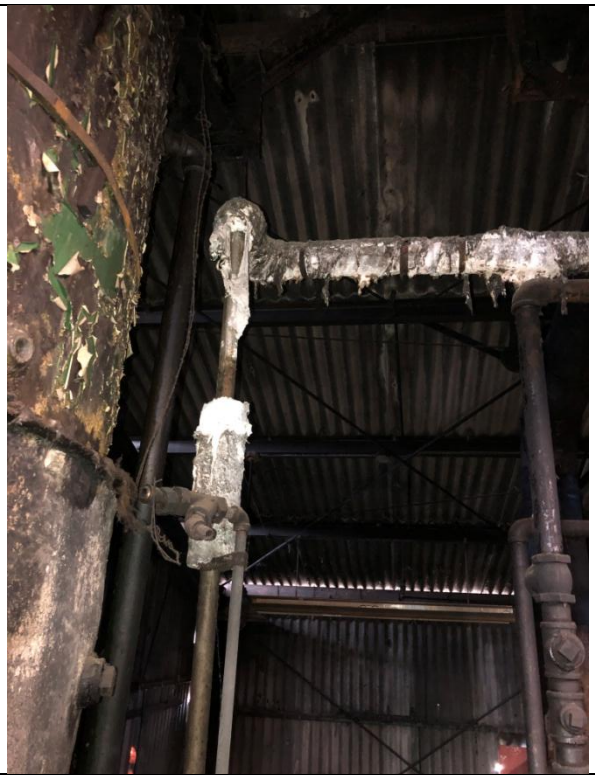
Appendix I

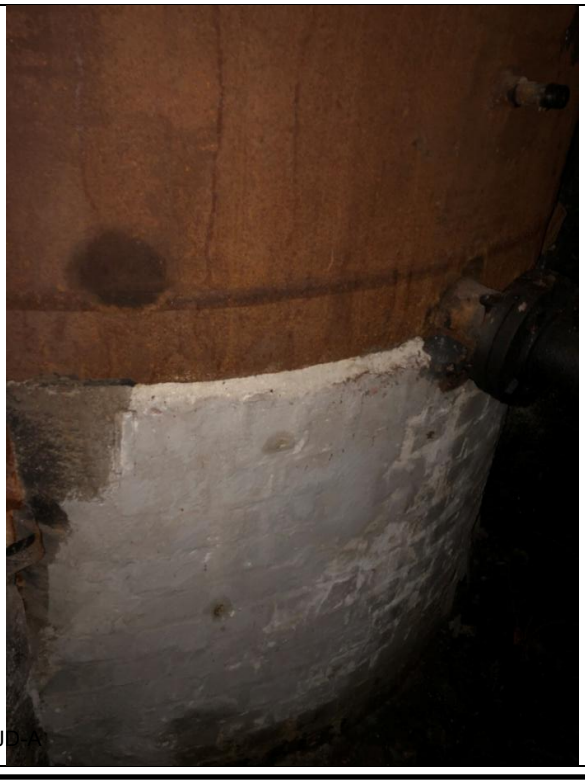
Site Photographs

AMD ENVIRONMENTAL



Location:
Building 3

Observation:
Thermal systems insulation found to contain asbestos.



Location:
Building 3

Observation:
Parging on vessels found to contain asbestos.

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Appendix A: Firm Certification and Personnel License(s)

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New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

AMD Environmental Consultants, Inc.
Suite L1
712 Main Street

Buffalo, NY 14202

FILE NUMBER: 10-56177
LICENSE NUMBER: 56177
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 10/25/2019
EXPIRATION DATE: 11/30/2020

Duly Authorized Representative – Anthony DeMiglio:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Eileen M. Franko, Director
For the Commissioner of Labor

SH 432 (8/12)

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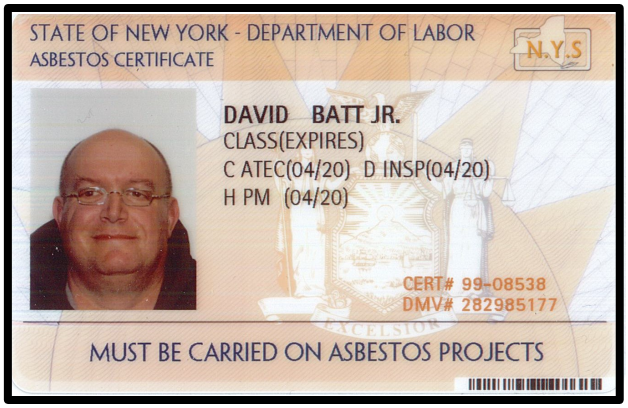

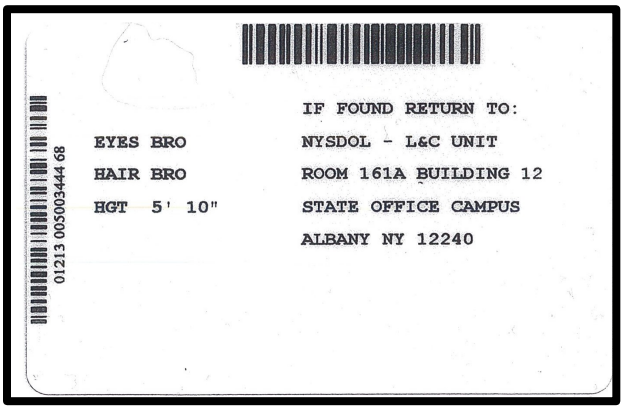

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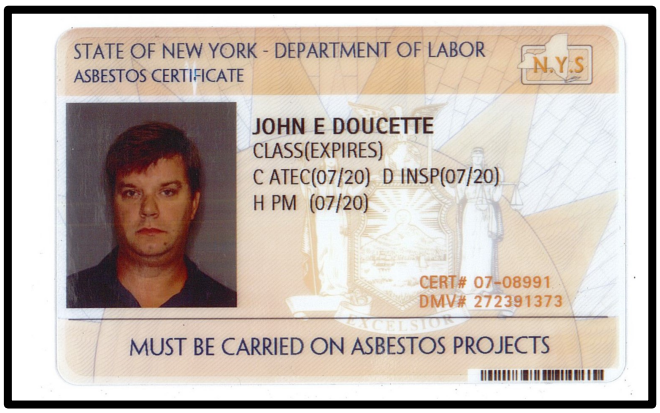

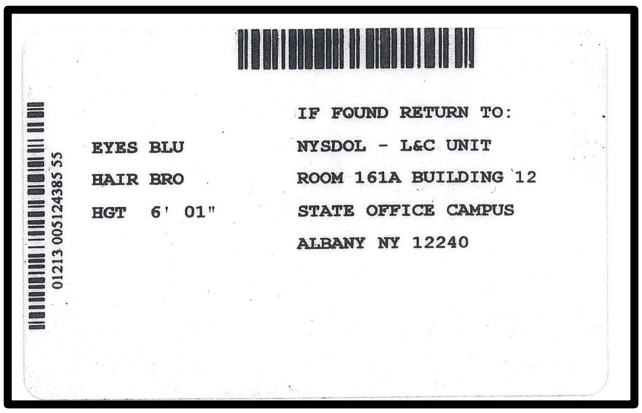

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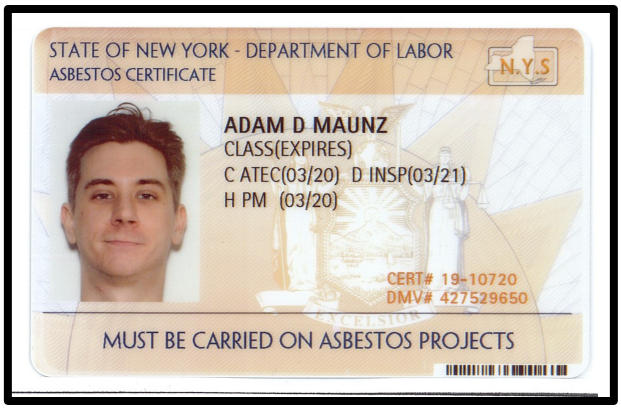

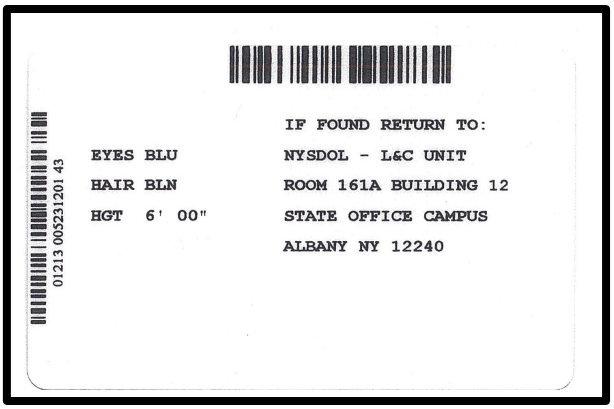

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Appendix B: Laboratory Certification

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2020
Issued April 01, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. PAUL J. MUCHA
AMERICA SCIENCE TEAM NEW YORK, INC
117 EAST 30TH ST
NEW YORK, NY 10016

NY Lab Id No: 11480

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual

Serial No.: 59674

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

Page 1 of 1

APPENDIX D

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

BROWNFIELD CLEANUP PROGRAM
For
140 Chandler Street, LLC
Western Portion of 140 Chandler Street Site, 140 Chandler Street, Buffalo, New York 14207
BCP # C915354

Prepared For:
140 Chandler Street, LLC
391 Washington Street, Buffalo, New York 14203
WGS Project No: 19211

Prepared By:
Wittman GeoSciences, PLLC
3636 North Buffalo Road
Orchard Park, New York 14127
716-574-1513

January 9, 2020 rev May 15, 2020

WITTMAN
GeoSciences, PLLC

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LIST OF ATTACHMENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been cooperatively developed by Wittman GeoSciences, PLLC (WGS) as prepared for 140 Chandler Street Site located at 140 Chandler Street located in the City of Buffalo, New York. The QAPP was prepared in general accordance with the requirements of Section 2.4 of the NYSDEC DER-10, Technical Guidance for Site Investigation and Remediation, dated May 2010 (DER-10). The 140 Chandler Street Site is in the process of being divided into two parcels, including Western Portion, identified as SBL #77.84-4-4.1; and Eastern Portion, identified as SBL #77.84-4-4.42. This QAPP will address work for the Western Portion of 140 Chandler Street Site (Western Portion) only.

The QAPP is designed to produce data of the quality necessary to achieve the project objectives. The objective of the QA/QC protocol and procedures is to ensure the information, data, and decisions associated with the project are technically sound and properly documented.

1.1 Project Scope

This QAPP presents the project scope, objectives, organization, planned activities, data quality objectives, quality assurance/quality control (QA/QC) procedures and sampling procedures. This project involves test borings, test pits, monitoring well installation, monitoring well development, and subsurface soil and groundwater sample collection. Proposed sampling locations are included on Figure 1 and a summary of the anticipated number of samples and analytical testing is included on Table 1. The project goal associated with the RI/IRM includes the following:

- Define the nature and extent of on-site contamination in both soil and groundwater.
- Identify on-site source areas of contamination, if any.
- Collect data of sufficient quantity and quality to evaluate potential threats to the public health and environment.
- Collect data of sufficient quantity and quality to evaluate remedial alternatives.

1.2 Project Organization

The general responsibilities of key project personnel are listed below. Resumes are included in Attachment A.

Project Manager: Ms. Michele Wittman, WGS Principal, will have responsibility for overall program/project management and coordination with NYSDEC and subcontractors.

Engineering: Mr. John Schenne, PE, is responsible for engineering aspects and responsibilities.

QA Officer: Mark Hanna, CHMM, HEI Principal, will serve as Quality Assurance Officer (QAO), and will be responsible for laboratory and data validation, subcontractor procurement and assignment, as well as data usability reports. The QAO may conduct audits of the operations at the site to ensure that work is being performed in accordance with the QAAP.

Field Team:	Eric Betzold will have overall responsibility for on-site implementation of the Site Investigation project activities. The technical team will consist of experienced professionals (i.e.; engineers, geologists, scientists) to gather and analyze data, prepare project documentation and collection of various soil and groundwater samples.

1.3 Project Sub-Contractors

Subcontractor specialists will be contracted for services relating to drilling and monitoring well installation, laboratory/analytical services, data validation services, field surveying, and waste transportation and disposal. The subcontractors will be determined approved by NYSDEC prior to beginning of site work:

Laboratory Analysis -	Alpha Analytical - A laboratory certified under the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) will perform the analysis
Data Validation -	Vali-Data of WNY
Test Pit Services -	Lazarus Industries, LLC
Exploration Services -	Trec Environmental
Surveying -	To be determined

2.0 FIELD INVESTIGATION PROCEDURES

Field sampling at the proposed 140 Chandler Street site has been designed to obtain representative samples of various environmental media to assess impact that the site may have to human health and the environment. The field investigation procedures include sampling for subsurface soils and groundwater.

Proposed sampling locations are included within the RI Work Plan. Environmental sampling and other field activities will be performed in general accordance with the appropriate techniques presented in the following guidance document.

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

Field activities are described in the following sections and in the RI Work Plan.

2.1 Air Monitoring

Air monitoring/screening of volatile compounds for health and safety concerns will be performed with a portable organic vapor meter (OVM) equipped with a photoionization detector (PID) that is using a 10.6 electron volt (eV) bulb. Monitoring will be done during invasive activities such as soil borings, monitoring well installation, well development, sampling, and IRM activities. Detections above background during air monitoring will require that the work be stopped until air monitoring levels decrease to background levels or until health

and safety protocol are upgraded and approved by NYSDEC. On-site personnel will be outfitted in modified Level D personnel protection (hardhat, safety glasses, work boots and gloves).

2.2 Soil Screening and Logging

Subsurface soil samples will be collected from direct push macro-core samplers in general accordance with American Society for Testing and Material (ASTM) D6282-98 Standard Guide for Direct Push Soil Samples for Environmental Site Characteristics. Subsurface soil sampling from split-spoon samples advanced ahead of hollow steam augers will be completed in general accordance with ASTM D1586-99. A soil boring log will be prepared for each location to include date, boring location, drill rig type, blow counts, sample identification, sample depth interval, percent recovery, OVM reading, stratigraphic boundaries, and well installation information.

Subsurface soil will be sampled by opening the split spoon sampler (borings) or slicing the core vertically down the middle with a sharp blade. Soil samples will be visually examined for evidence of suspect contamination (e.g., staining, odor) and field screened with a calibrated OVM. Portions of the soil samples may be placed in containers for future analytical testing. Different portions of the soil samples will be placed within sealable plastic bags and will be field screened the same day as collected. Prior to screening, the soil samples will be allowed to equilibrate to ambient temperature. The OVM sampling port will be placed within a corner of the bag. The peak reading will be recorded on the boring log. Portions of the soil samples may be placed in containers for future analytical testing.

2.3 Soil Sample Collection

Soil samples selected for VOC analysis will be collected using an Encore or Terracore sampling kit, limiting headspace by compacting the soil into the container. Samples for VOC will be placed into the appropriate container immediately after opening of sampler, prior to making any field measurements or sample homogenization.

Remaining soil samples will be homogenized using a "coning and quartering" procedure. The soil will be removed from the sampling equipment and transferred to a clean surface (metal foil, steel pan, bowl, etc.) and thoroughly mixed to provide a more homogeneous sample to the lab. An aliquot of the sample will then be transferred to the required sample containers and sealed with the appropriate cap.

Due to emergent contaminant sampling requirements, at this time acceptable materials for sampling include stainless steel, high density polyethylene (HDPE), PVC, silicone, acetate and polypropylene. Additional materials may be acceptable if pre-approved by NYSDEC. All sampling equipment components and sample containers should not come in contact with aluminum foil, low density polyethylene (LDPE), glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFC materials must be avoided. Many food and drink packaging materials and “plumbers thread seal tape” contain PFCs.

All clothing worn by sampling personnel must have been laundered multiple times. The sampler must wear nitrile gloves while filling and sealing the sample bottles.

2.4 Soil Borings

Soil borings will be completed using either direct push subsurface investigation techniques or rotary drilling with continuous split spoon sampling and hollow stem augers. Drilling cuttings will be visually inspected and screened with an OVM and managed consistent with DER-10 requirements. Soil sampling will be conducted to define the subsurface conditions. During continuous sampling process, soil samples will be field screened for the presence of VOCs using an OVM. Soil samples for laboratory analysis will be selected in the field based on visual/olfactory observations and OVM screening results.

The drill rig/ soil probe rig, tools, augers, etc. will be decontaminated between holes at an on-site temporary decontamination pad or area. Decontamination will be accomplished using steam cleaning or high pressure wash equipment. Direct push sampling equipment and split spoon sampling devices will be cleaned manually with non-phosphate detergent (i.e., Alconox) wash and potable water followed by a potable water rinse or a second steam cleaning followed by a distilled/deionized water rinse. All equipment will be cleaned prior to leaving the Site.

2.5 Test Pits

Test pits will be completed using a track-mounted excavator and bucket to provide a detailed visual examination of near surface soil, and fill materials present on-site. Samples will be collected from the walls and/or floor through the use of a bucket, steel trowels and bowls. The samples will be placed directly into the appropriate containers, inspected and screened for the presence of VOCs using an OVM, and managed consistent with DER-10 requirements. Soil samples for laboratory analysis will be selected in the field based on visual and olfactory observations and OVM screening results.

Sampling equipment will be cleaned manually with non-phosphate detergent (i.e., Alconox) wash and potable water, followed by a potable water rinse or a second steam cleaning, followed by a distilled/deionized water rinse. All equipment will be cleaned prior to leaving the Site.

2.6 Monitoring Well Installation

Monitoring wells will be constructed of 2-inch ID flush coupled Schedule 40, polyvinyl chloride (PVC) riser and screen. The actual installation depth and screen depth will be selected based on groundwater depth, observation of subsurface materials and headspace screening test results. In general, the screen will consist of a maximum 10 foot length of 0.010-inch machine slotted well screen. A schematic of the well construction detail is provided as Figure 2.

Following placement of the assembled screen and riser, the borehole will be backfilled. The well screen depth will be backfilled with silica sand filter pack (estimated at size #0) from the base to a minimum of one (1) foot above the well screen. A minimum 1-foot layer of bentonite pellets will be placed above the sand filter and allowed to hydrate. A mixture of cement/bentonite water will be placed above the bentonite seal. The monitoring well will be

completed by placing a locking steel casing or road box over the riser. Concrete will be then placed in the borehole around the protective casing and sloped away from the casing.

2.7 Monitoring Well Development and Sampling

2.7.1 Monitoring Well Development

Monitoring wells will be developed by utilizing either a dedicated tubing or new dedicated disposable bailer, depending on the field conditions. Fluids will not be added during development process. New, dedicated well development equipment will be utilized prior to development of each well. The well development procedure is listed below.

- Well cover will be unlocked. OVM will be used to survey the ambient air and air directly at the top of the well.
- Take a pre-development static water level measurement.
- Sound the bottom of the well and agitate/loosen accumulated sediment.
- Calculate water volume in the well.
- Obtain initial field water quality measurements, including pH, specific conductance, turbidity, and temperature obtained using a Horiba U-22 water quality meter (or equivalent).
- Alternate water agitation methods such as moving a bailer or pump tubing up and down inside screened interval coupled with water removal methods (pumping or bailing) in order to suspend and remove solids/sediment from the wells.
- Water quality meter measurements should be recorded every one to three gallons of water removed. Record water quantities removed and water quality measurements.
- Development can cease when the following water quality criteria are met, or at least 5 well volumes have been removed.
  - Water is clear and free of sediment and turbidity is less than 50 nephelometric turbity units (NTUs)
  - pH is +/- 0.1 standard unit between readings
  - Specific conductivities is +/-3% between readings
  - Temperature is +/-10% between readings
- Record post-development water level readings. Development information will be recorded on well development logs.

After the water level has returned to its pre-purge level (or within a maximum of two hours, if the well has recharged sufficiently to allow sampling), samples will be collected from the middle of the screened portion of the well for overburden wells. If the water level is slow to recharge and does not reach to its pre-purge level within two hours, then samples can be collected after sufficient water has recharged, and the degree of recharge indicated in field notes with time and depth to water noted.

2.7.2 Groundwater Sampling

Groundwater samples will be collected by utilizing low-flow sampling techniques with dedicated tubing or by conventional methods using a new dedicated disposable bailer. A peristaltic pump and new disposable high-density polyethylene (HDPE) tubing will be used at each location. Tubing and sampling equipment will be clean upon arrival at the Site. The well will be sampled after removal of three well volumes or well purging.

A Well Data Sheet should be completed during groundwater sampling. Each well to be sampled will have designated pre-labeled, certified clean, sample bottles. The following steps describe the groundwater sample procedure.

- Unlock and remove well cap. Test the air at the wellhead with the OVM.
- Measure the static water level. Determine the total well volume.
- Slowly lower the dedicated bailer or tubing into the well. Purge the well, minimum of three well volumes. If the well goes dry during bailing, allow for full recovery and sample. If recovery takes longer than 20 minutes, proceed to next well but return to sample within 24 hours.
- Fill the appropriate sample bottles. Two or three (depending on laboratory-specific requirements) 40-ml glass vials (with Teflon septa) will be used to collect samples for VOCs. Sample collection with the following sample collection order: volatile organic compounds, semi-volatile organic compounds, PCBs/pesticides/herbicides and metals. If the well should go dry during sampling, the well should to be re-sampled the next day. The second attempt to sample the well will proceed with the same sample order.
- Preservative for the various sampling preservatives will be added by the laboratory provided jars. The following parameters required additional special handling.
  - VOC samples must be free of air bubbles. When the container is determined to be bubble free, the sample containers should be immediately chilled.
  - Metals analysis should be preserved with nitric acid to a pH less than 2.
- Record pertinent information in the field logbook and well data sheet.
- Lock well, inspect well site, and note any maintenance required.
- Purge water will be containerized for future disposal.

Per- and polyfluoroalkyl substances (PFAS) Sampling Protocol

Groundwater sample collection procedure for PFAS will be done in accordance with NYSDEC protocol identified in "Guidelines for Sampling and Analysis of PFAS, Under NYSDEC's Part 375 Remedial Programs" dated January 2020, included in the Quality Assurance/Quality Control (QAPP) found in Appendix B.

2.8 Background Samples

Due to the historical industrial usage of the site and industrial nature of the site contaminants, soils and groundwater samples have not been pre-designed as likely to characterize site background conditions.

2.9 Equipment Decontamination

In order to reduce the potential for cross-contamination of samples collected during the project, sampling equipment will be decontaminated to ensure that data is acceptable. It is anticipated that most of the materials used in sample collection will be disposable one-time use materials, such as sampling containers, bailers, tubing, gloves, etc.

Non-dedicated material such as split spoon samples, stainless steel mixing bowls, drill rig, water-level indicator, etc., will be decontaminated by the following methods:

- Steam clean the equipment within a dedicated decontamination area; or
- Decontamination typically involves scrubbing/washing with a laboratory grade detergent (e.g. alconox) to remove visible contamination, followed by potable (tap) water and analyte-free water rinses. Tap water may be used from any treated municipal water system.

The effectiveness of the equipment decontamination of non-dedicated sampling equipment will be evaluated via analytical testing of rinsate blanks. Decontamination liquids, disposable equipment, and PPE will be containerized for future disposal.

2.10 Storage and Disposal of Investigation-Derived Waste

The sampling methods and equipment have been selected to limit the need for decontamination and the volume of waste material to be generated. Investigation-derived material (e.g., drill cuttings and purge water) generated will be presumed to be non-hazardous waste and will be disposed at the boring or well from which the material was derived. Excess auger cuttings will be drummed and stored on-Site for future disposal. Monitoring well development/purge water will be containerized in 55-gallon drums for testing and future off-site disposal.

Personal protective equipment and disposable sampling equipment will be placed in plastic garbage bags for disposal as a non-hazardous waste.

Decontamination water used in steam cleaning and/or spoon washing, and rinse water, including detergent, may be generated during Site work. Tap and analyte-free water used for rinsing will be allowed to percolate back into the ground, or will be disposed into a sanitary system. Non-phosphate detergent and water rinse will be disposed into a sanitary system.

2.11 Survey/Site Mapping

A base map will be prepared by a New York State licensed surveyor. This will allow measurement of the actual exploration locations and elevations. The base map will include property lines, buildings, fence lines, and other key site features. The surveyor may establish the horizontal location and vertical elevations. The map will include the RI investigation/sampling locations, as well as completed IRM work excavation limits. Monitoring well vertical measurements will include the ground surface at exploration locations, plus the top of casing and top of riser at monitoring well locations. The top of riser will serve as the water level monitoring point. Soil/fill boring locations will be field located and incorporated within the survey. Elevations of the ground surface and top of PVC riser will be measured for each monitoring well.

3.0 SAMPLE HANDLING and MANAGEMENT

Various environmental samples will be collected during the RI/IRM investigation work. The procedures below will assist in documentation and tracing of the various samples. During sampling, field personnel will wear disposable or latex or nitrile gloves. Gloves will be changed and discarded between sampling locations.

Laboratory analysis samples will be placed in new laboratory-grade containers. Appropriate sample preservatives will be added to the sample containers by the laboratory prior to delivery to the project site. The specific volume and preservation of samples, if any, is summarized on Table 2. Samples will be shipped to the laboratory within 48-hours from sample collection. Samples will be kept in coolers, on ice, for shipment to the analytical laboratory.

3.1 Sample Label and Identification

Each field and QC sample will be identified by a self-adhesive, non-removable label placed on the sample containers. The label information will include, at a minimum, client name, site location, data and time of collection, sample identification number, sampler's name, and notes, as needed recorded in waterproof ink. All sample bottles within each shipping container will be individually labeled with the laboratory provided label.

Each sample will with a unique identification using the following test location designations:

Designation	Media Type	Sample Location	Example
SB	Soil	Soil boring number with sample depth interval (x-x')	SB1 (8-10')
MW	Groundwater	Monitoring well with well number	MW2
EX	Soil	Excavation confirmation sample with sample depth interval	EX3 (1-2')
TB	Trip blank	None – include day/month/year	TB1 – 10/25/16
RB	Rinsate blank	Any – rinsate of sampling equipment; include day/month/year	RB2 – 10/25/16
MS/MSD	Matrix spike/ matrix spike duplicate	Any – identify original sample location	SB1 MS MW2 MSD

Quality control (QC) field duplicate samples will be submitted blind to the laboratory; a fictitious sample identification will be created using the same system as the original. The sample identifications (of the original sample and its field duplicate) will be marked in the project specific field book and on the copy of the chain-of-custody kept by the sampler and copied to the project manager.

3.2 Chain of Custody

A chain-of-custody form will trace the path of sample containers from the project site to the laboratory. An example Chain of Custody is included in Attachment 2. The chain-of-custody documentation will accompany the samples from their inception until analysis.

Pertinent field information will be included on the chain-of-custody, including client name, project name/location, sampler name, sample identification number, date, time, media, grab/composite, number of containers, analysis required, and preservation.

Samples will be packaged into coolers used for shipment. The cooler will be packed with ice (or equivalent) to maintain sample temperature at 4 ºC. The chain of custody forms will be signed and placed in a sealed plastic bag in the cooler. The cooler will be sealed and custody seal placed over the cooler opening, designed to break if opened or disturbed. The custody seal will be signed and dated. Shipping tape will be wrapped around the cooler and over the custody seal. Sample receipt personnel at the laboratory will document whether the custody seals remained intact upon arrival and lab personnel will sign the chain-of-custody form.

4.0 FIELD DOCUMENTATION

Daily field activities will be recorded in a bound field notebook. The field notebook will include the following daily information for Site activities:

- Date, time of arrival, time of departure, weather conditions.
- Field staff, sub-contractors or other personnel on site.
- Description of field activities and location of work area.
- Equipment used on site (such as drill rig, operator)
- Field observations and descriptions, such as soil descriptions, well/piezometer installation information, evidence of contamination, staining, odors, etc.
- Field measurements (OVM, water quality readings) and calibration
- Sampling locations, depths, identification numbers, time, etc.
- Sampling location measurements.
- Chain of custody information
- Modifications to scope of work or issues encountered.

Field notes may be transferred to soil boring logs, or monitoring well forms as part of the RI/IRM. Typical forms to be utilized during the field investigation are presented in Attachment 2 and include:

- Daily Field Report
- Soil Boring Log or Test Pit Log
- Monitoring Well Installation Log
- Well Development Data Sheet
- Chain of Custody
- Building Inventory; and
- SVI Sampling Data Sheet

5.0 ANALYTICAL LABORATORY QA/QC PROTOCOLS

This section describes the analytical methods, principles and procedures that will be used to generate quality data. These protocols include laboratory calibration, field equipment calibration, QC sample collection and analysis, quantitative evaluation of data quality protocols and data qualification, if necessary.

5.1 Analytical Methods, Procedures and Calibration

Chemical analysis for samples collected during the field work will be completed by a laboratory capable of performing project specific analysis as included in this QAAP.

5.1.1 Analytical Methods

Sample analytical analysis will be consistent with the NYSDEC ASP Category B requirements. Specific methods and references for each parameter including sample preservation and holding times are shown on Table 2. Quantification and detections limits for all analysis are those specified under the appropriate test methods.

NYSDEC has provided specific laboratory requirements associated with 1,4-dioxane and PFSA analytical methods, which are included in Attachment 3.

5.1.2 Laboratory Instrumentation & Equipment

Laboratory instruments and equipment will be calibrated following SW-846 analytical methods protocol and laboratory requirements.

5.1.3 Field Equipment

Various field equipment will be used during the project. Calibration of the field equipment will be complete in accordance with manufacture's specifications, prior to the start of each day.

Organic Vapor Meter – Real-time monitoring for VOCs will be done with an organic vapor meter (OVM) equipped with a photoionization detector (PID) to evaluate the nature and extent of potential petroleum or solvent impacts at the site. The OVM will be calibrated on a daily basis in accordance with manufacturer's specifications.

Particulate Monitoring Equipment – Particulate air monitoring will be completed during soil excavation activities as part of the IRM as noted in the Community Air Monitoring Program (CAMP). Measurements will be collected along the upwind perimeter of the excavation areas to assess the amount of particulates naturally occurring in the air. The particulate meter will be regularly calibrated in accordance with the manufacturer's specifications.

Additional Field Equipment – Additional field equipment will be used as part of the project including an electric static water level indicator and Horiba U-22 water quality meter that measures pH, specific conductivity, temperature, dissolved oxygen, oxygen reduction potential and turbidity. The meters will be calibrated in accordance with the manufacturer's specifications.

5.2 Quality Control Samples

Analytical methods, summarized on Table 2, to be utilized for laboratory sample analysis address the quality control to be used and the frequency of replicates, blanks and calibration standards for laboratory analytical equipment. Several types of field QC samples will be collected and submitted for laboratory analysis including trip blanks, sample duplicate, matrix spike and matrix spike duplicate.

Trip blanks – A trip blank sample monitors for potential impacts due to handling, transport, cross contamination from other samples during storage or laboratory contamination. The trip blanks, for aqueous VOCs only, will consist of analyte free reagent grade water in VOC sampling containers to be used for the project. Trip blanks will be prepared at the laboratory, sealed, transported to the Site and returned without being opened to assess contamination that may have occurred during transport. Trip blanks will be submitted at a rate of one per cooler when aqueous VOCs are shipped to the laboratory.

Blind duplicates – Blind duplicate samples are used to monitor field and laboratory precision, as well as matrix heterogeneity. The samples are separate aliquots of the same sample, collected from the same location, at the same time, in the same manner as the first, and placed into a separate container. Each duplicate sample will be analyzed for the same parameters as the original sample collected that day. Blind duplicates will be collected at a frequency of 1 per 20 environmental samples of a given matrices (i.e. soil or groundwater).

Matrix spike/matrix spike duplicate (MS/MSD) are used to monitor precision and accuracy of the analytical method on various matrices. The samples are spiked with known quantities of target analytes at the laboratory. The MS/MSD will be collected at a frequency of 1 pair per 20 environmental samples of a given matrices (i.e. soil or groundwater).

Rinsate Blanks – Rinsate blank is used to indicate potential contamination from sample instruments used to collect and/or transfer samples. The rinsate blank will be generated by passing distilled water through and over cleaned sampling equipment. Rinsate blank samples will not be performed when dedicated disposal equipment is used. The rinsate blank will be collected at a frequency of 1 per 20 environmental samples of a given matrices (i.e. soil or groundwater).

5.3 Corrective Actions

If instrument performance or data fall outside acceptable limits, then corrective actions will be taken to resolve problems and restore proper functioning of the analytical system. Actions may include recalibration or standardization of instruments, acquiring new standards, replacing equipment, repairing equipment, and reanalyzing samples or redoing sections of work. Subcontractors providing analytical services should perform their own internal laboratory audits and calibration procedures with data review conducted at a frequency so that errors and problems are detected early, thus avoiding the prospect of redoing large segments of work.

6.0 DATA USABILITY

The main objective of the DUSR is to determine whether the data presented meets the project-specific needs for data quality and data use. Data validation will be performed and a Data Usability Summary Report (DUSR) will be prepared to meet the NYSDEC requirements for analytical data generated during the RI/IRM. The DUSR will be completed in general accordance with Appendix 2B of DER-10. The findings of the DUSR will be incorporated in the RI/AAR report. Waste characterization and/or delineation samples will not be validated.

TABLES

TABLE 1
Analytical Testing Program Summary
Western Portion - 140 Chandler Street Site
140 Chandler, Buffalo, NY
NYSDEC Brownfield Cleanup Program - #C915354

Location	Number of Proposed Locations	Matrix	TCL VOCS	TCL SVOCs	TAL METALS Total	TAL METALS dissolved	PCBs	Pest/ Herbs	VOC TO-15	1,4-dioxane	PFAS
Surface Soil Samples											
Surface Soil Sample	0	Soil	-	-	-	-	-	-	-	-	-
Duplicate		Soil	-	-	-	-	-	-	-	-	-
MS/MSD		Soil	-	-	-	-	-	-	-	-	-
Rinsate		Water	-	-	-	-	-	-	-	-	-
Total			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Soil Borings - Subsurface Samples											
Soil Boring Locations	9	Soil	5	5	5	-	3	2	-	1	1
Duplicate		Soil	1	1	1	-	1	1	-	-	-
MS/MSD		Soil	2	2	2	-	2	2	-	-	-
Rinsate		Water	1	1	1	-	1	1	-	-	-
Total			**9**	**9**	**9**	**0**	**7**	**6**	**0**	**1**	**1**
Test Pits - Subsurface Samples											
Test Pit Locations	16	Soil	8	10	10	-	10	2	-	2	2
Duplicate		Soil	1	1	1	-	1	1	-	1	1
MS/MSD		Soil	2	2	2	-	2	2	-	2	2
Rinsate		Water	1	1	1	-	1	1	-	1	1
Total			**12**	**14**	**14**	**0**	**14**	**6**	**0**	**6**	**6**
Monitoring Wells											
Monitoring Well	3	Groundwater	3	3	3	3	3	3	-	3	3
Duplicate		Groundwater	1	1	1	1	1	1	-	1	1
MS/MSD		Groundwater	2	2	2	2	2	2	-	2	2
Rinsate		Water	1	1	1	1	1	1	-	1	1
Trip Blank		Water	1	-	-	-	-	-	-	-	1
Total			**8**	**7**	**7**	**7**	**7**	**7**	**0**	**7**	**8**
Sub-slab Vapor/Ambient Air samples											
Sub-slab	1	Air	-	-	-	-	-	-	1	-	-
Ambient Air	1	Air	-	-	-	-	-	-	1	-	-
Outdoor	1	Air	-	-	-	-	-	-	1	-	-
Duplicate		Air	-	-	-	-	-	-	1	-	-
Total			**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**

	VOCs	SVOCs	METALS	METALS	PCBs	Pest/ Herbs	VOC - TO-15	1,4-dioxane	PFAS
TOTAL SAMPLES	**29**	**30**	**30**	**7**	**28**	**19**	**4**	**14**	**15**

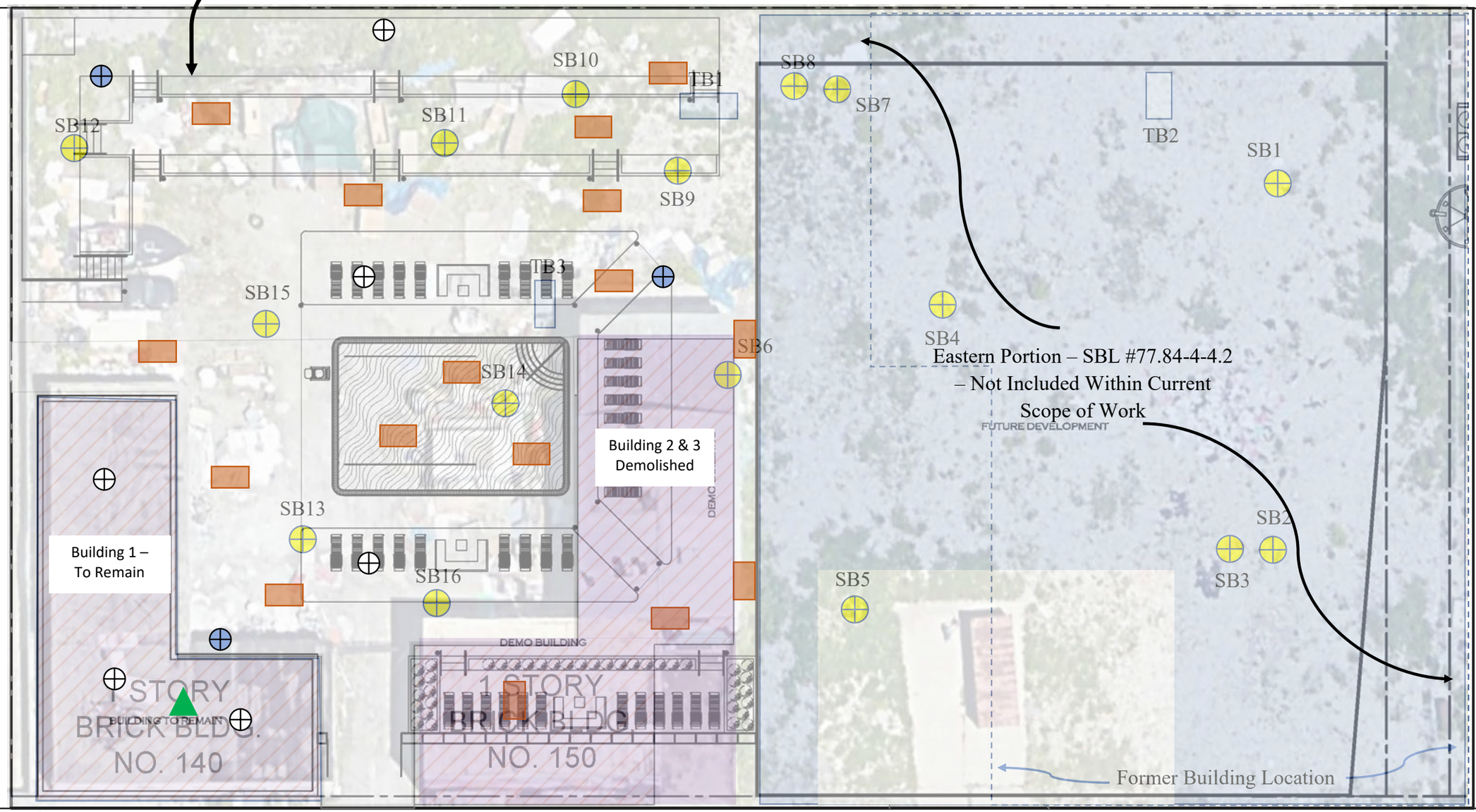
Notes:

TCL VOCs - Target Compound List Volatile Organic Compounds.
TCL SVOCs - Target Compound List Semi-volatile Organic Compounds.
TAL Metals - Target Analyte List Metals.
TCL PCBs - Target Compound List Polychlorinated Biphenyls.
PFAS - Polyfluoroalkyl Substances

TABLE 2
Sample Container, Volume, Preserving and Holding Time Requirements
140 Chandler Street Site
140 Chandler Street, Buffalo, NY
NYSDEC Brownfield Cleanup Program

PARAMETER DESCRIPTION	MATRIX	METHOD NO.	Quantity/ Bottle Type	Preservation	Holding Time
Soil Samples					
Volatiles, TCL list	Soil	5035/3035A/8260	Encore or Terracore Samplers	Freeze withint 48 hours	Freeze within 48 hours 14 days
Semi-Volatiles, TCL list	Soil	8270	(1) 4oz glass jar	Cool, 4 C	14 days
Metals, TAL (no CN)	Soil	6010/7000	(1) 4oz glass jar	none	180 days, Mercury 28 days
PCBs	Soil	8082	(1) 4oz glass jar	Cool, 4 C	365 days/40 days from extraction
Pesticides	Soil	8081	(1) 4oz glass jar	Cool, 4 C	14 days/40 days from extraction
Herbicides	Soil	8151	(1) 4oz glass jar	Cool, 4 C	14 days/40 days from extraction
1,4-Dioxane	Soil	8270-SIM	(1) 8oz glass jar	Cool, 4 C	14 days
Polyfluoroalkl Substances (PFAS)	Soil	Method 537	(1) 8oz glass jar	Cool, 4 C	28 days
Monitoring Wells					
Volatiles, TCL list	Water	8260	(3) 40ml vial	Cool, 4 C, HCL	14 days
Semi-Volatiles, TCL list	Water	8270	(2) 1 liter amber	Cool, 4 C	7 days
PCBs	Water	8082	(2) 1 liter amber	Cool, 4 C	7 days/40 days from extraction
Pesticides	Water	8081	(2) 500ml amber	Cool, 4 C	7 days/40 days from extraction
Herbicides	Water	8151	(2) 1 liter amber	Cool, 4 C	7 days/40 days from extraction
Metals, TAL	Water	6010	(1) 250ml plastic	HNO3	180 days
Mercury, Total	Water	7000	(1) 250ml plastic	HNO3	28 days
Metals, TAL (dissolved) field filtered	Water	6010	(1) 250ml plastic	HNO3	180 days
Mercury, Dissolved	Water	7000	(1) 250ml plastic	HNO3	28 days

FIGURES



= Soil Boring Location (5/19)

= Test Pit Location (5/19)

= Proposed Geoprobe Location – 12 foot depth

= Proposed Monitoring Well Location

= Proposed Test Pit Location

= Vapor Intrusion Sample Location

WITTMAN GeoSciences, PLLC

SCALE IN FEET: 1" =20'

0 20

TITLE: Proposed Remedial Investigation Locations	PROJECT NAME / LOCATION: 140 CHANDLER STREET BUFFALO, NEW YORK	DATE: 05/2020	FIGURE: 1
		PROJECT NO.: 19211	DRAWN BY: CMC
			CHECKED BY: MMW

Wittman GeoSciences, PLLC	Date started: Date finished:	Hole No.: Sheet 1 of 1

location:
Location:

Project No.: Proj. Mgr:	Drilling Co. Driller: Drill Rig:	Weather:

Depth (ft.)	Sample No.	Sample Depth (ft.)	Sample Blows /6"	Well Construction Details	Field Analytical Readings	Well Details	Groundwater and Other Observations
				1" well completed w/ flush road box			
				Cement/bentonite mix (1' - 2')			
4	2	4-8		Bentonite pellets (2'-4')			
				1" sch. 40 PVC riser (0'-5')			
8	3	8-12		#0 sand (4'-15')			
12	4	12-15	N/A: Well completed w/ geoprobe drill rig	1" sch. 40 PVC (.010 slot screen).			
				Bottom of screen 15 feet bg.			
				Bottom of borehole 15 feet bg.			
16							
24							
30							

S=Split Spoon: _____ T= Shelby Tube: _____
R= Rock Core: _____ WH = Weight of Hammer
N = ASTM D1586

Backfill Well Key:
Grout
Cement/ Bentonite
Sand
Bentonite

Attachment 1

Resumes

Michele M. Wittman, P.G.
Principal

WITTMAN
GeoSciences, PLLC

Education

B.A., 1994, Geology, State University of New York at Buffalo

B.S., 1994, Social Sciences-Environmental Studies, State University of New York at Buffalo

Professional Registrations

2018, Professional Geologist, New York, #000726

2002, Professional Geologist, Washington, #1772

Affiliations and Certifications

New York State Council of Professional Geologists, Member
Buffalo Association of Professional Geologists, Member
Air and Waste Management Association of Western New York, Member
OSHA 40 Hour 29 CFR 1910. (HAZWOPER) Certification

Ms. Wittman is a Professional Geologist with over 24 years of professional experience in conducting a variety of environmental projects for both private and public clients. Clients have included industry, governmental agencies, developers, legal firms, financial institutions, and engineering firms. Project work has included conducting and managing Phase I and Phase II Environmental Site Assessments throughout New York and surrounding states, Brownfield Cleanup Program project investigations and site remediation, hydrogeologic investigations, remedial option evaluation and cost estimating, and remediation of soil and groundwater.

Ms. Wittman's responsibilities have ranged from supervising field and technical activities, completion of field work including soil classification, well installation, collection of environmental laboratory samples, excavation oversight; training staff, data analysis, report preparation and review, and client contact. Additionally, responsible for developing and maintaining client relationships, account and project management, bidding, contracting and scheduling and financial management including budgets, proposals, profit/loss assessment. Ms. Wittman has also acted as business manager which included business development and client management, generation of marketing materials; supervising administration staff, and office management.

Ms. Wittman also previously held the position as Assistant Vice President and Environmental Risk Analysis Officer at an international financial institution. During her tenure at this position, Ms. Wittman reviewed hundreds of environmental reports and provided remedial cost estimates to evaluate the potential risk and future losses.

Areas of Specialization

- ✓ Brownfield Cleanup Program
- ✓ Remedial Investigations
- ✓ Feasibility Studies
- ✓ Hydrogeologic Investigations
- ✓ Petroleum and Chemical Bulk Storage
- ✓ Environmental Site Assessments
- ✓ Geologic Evaluations
- ✓ Soil Testing
- ✓ Budgeting & Cost Controls
- ✓ Subcontractor/Crew Management

Environmental Project Highlights

Phase I Environmental Site Assessments – Various
Ms. Wittman has performed, completed, managed or reviewed over 1,500 Phase I Environmental Site Assessments (ESAs) from areas throughout the United States, with focus in the north east and Western New York area. Site assessments have ranged from small, vacant properties, apartment complexes, office buildings, commercial buildings, shopping plaza, automotive dealerships, gasoline stations, as well as small to large 1,000,000-square foot manufacturing and industrial facilities. Ms. Wittman has completed all aspects of Phase I ESAs including site visits, historical review, municipal agency review, database evaluations, and report preparation.

Phase II Environmental Site Assessments – Various
Ms. Wittman has been involved with hundreds of Phase II ESAs at various commercial, manufacturing, industrial and gasoline station properties. Work has included completion of soil borings and/or test pits, installation of groundwater monitoring wells, collection of soil and/or groundwater samples, and vapor intrusion sampling. Ms. Wittman completes data evaluation including with a final report with conclusions and recommendations, if appropriate.

Brownfield Cleanup Program – Commercial Facility, Cheektowaga, New York
Project Coordinator/Manager and Geologist for the investigation and remediation of a former gasoline station for future commercial and residential usage. Completed appropriate BCP application and work plans as required. Site work involved remedial investigation and an interim remedial measure including removal of two underground storage tanks and petroleum impacted soil. Completed required reporting and received certificate of completion in December 2018.

Brownfield Cleanup Program – Commercial Facility, Buffalo, New York
Project Coordinator/Manager and Geologist for the investigation and remediation of a former industrial facility for future proposed brewery, restaurant, commercial and residential usage. Completed appropriate BCP application and work plans. Oversight for site work that included remedial investigation, and removal of over 3,000 tons of historical industrial fill, removal of underground storage tank, and removal of impacted soil within the building. Completed final reporting and facility received certificate of completion in December 2018.

Brownfield Cleanup Program – Commercial Facility, Buffalo, New York
Project Coordinator/Manager and Geologist for the investigation and remediation of a former industrial facility for future proposed commercial and residential usage. Completed BCP application and work plans. Site work included remedial investigation, which identified high concentrations of PCBs and hazardous concentrations of lead within site soil. Remedial design included removal and out-of-state disposal of PCB soils and on-site stabilization and off-site disposal of lead impacted soils. Remedial work also included excavation of underground storage tank, and removal of impacted soil and concrete within the building. Additionally, significant asbestos abatement was completed. Remedial design included installation of a sub-slab vapor mitigation system. Completed final reporting. Facility received certificate of completion in December 2017 in less than nine months from work plan approval.

Brownfield Cleanup Program – Commercial/Industrial Facility, Buffalo, New York
Project Coordinator/Manager and Geologist for the investigation and remediation of a former industrial facility for future development as athletic fields. Completed BCP application and work plans. Site work included remedial investigation with over 100 soil borings, test pits, hand auger samples, and vapor intrusion locations. Historical fill with depths ranging up to 19 feet below ground surface was present in portions of the site. VOC impacts were identified in groundwater in limited area of the site, as well as vapor intrusion. Remedial designs included installation of sub-slab depressurization system, groundwater remediation, and management of historical industrial fill. Project remediation and development planned for spring/summer 2019.

Brownfield Cleanup Program – Commercial Facility, Buffalo, New York
Project Coordinator/Manager and Geologist for the investigation and remediation of a former industrial facility for future usage as incubator space within the City of Buffalo. Completed BCP application, as well as remedial investigation and interim remedial measures work plan. Site investigation work planned for Spring 2019.

Brownfield Cleanup Program – Future Commercial Facility, Orchard Park, New York
Project Coordinator/Manager and Geologist for the investigation and remediation of a former county incineration facility with process pond. Completed BCP applications and remedial investigation work plan. Site investigation work planned for Spring 2019.

Remedial Cleanup - Commercial Facility, Amherst, New York
Project Manager and Geologist for the remedial oversight during new building construction, which resulted in identifying former oil/water separator pits, hydraulic lifts, and underground tanks. Each underground structure was evaluated upon discovery, removed, and appropriate samples collected for laboratory analysis. NYSDEC oversight was present during the construction process and one NY Spill was assigned to the site. Upon completion of the project, a final report was done to summarize the findings and the NY Spill was closed.

Remedial Action Plan Evaluation – Former Bulk Petroleum Terminal, Rochester, New York
Developed Remedial Action Plan for former terminal property that underwent extensive subsurface investigations resulting in over 70 borings and 80 soil sample analyses. Initial remedial estimates (by others) included significant soil excavation and remedial costs. Our evaluation included comparison to NYSDEC CP-51 soil guidance for assessment of potential remediation. As such, based on minimal groundwater contamination and identification of significant impacts at greater depths, and negotiation with NYSDEC, no soil remediation was needed.

Management of Environmental Conditions – Retail Gasoline Chain, Western New York
Evaluated environmental concerns associated with 75 different retail gasoline stations. Reviewed regulatory information, previous reports, and data analysis to assess current environmental status. Developed a summary of findings and recommendation of action for each property. Further evaluations included Phase II investigation and continued monitoring of remedial efforts. Developed remedial cost estimate ranges for locations current undergoing remedial work.

Voluntary Cleanup Program - Commercial Facility, Hamburg, New York
Completed a Phase I ESA and identified historical dry cleaner. Conducted investigation and identified contamination beneath the building floor slab and behind the building (i.e. back door). Interim remedial measures (IRM) included soil removal, resulting in approximately 200 tons of soil that was disposed at a hazardous waste landfill. A soil vapor intrusion study was done and identified the presence of compounds To achieve site closure, negotiated a remedial solution that included confirmation sampling of soils around the building structure and installation of a sub-slab depressurization/vent system.

Contract to Closure, Remedial Activities, Commercial Facility, Rochester, New York.
Two former gasoline stations were located at adjoining properties. Our client wanted to develop the Site for commercial use. Completed a Site Investigation and identified subsurface soil contamination, groundwater contamination and separate phase product. Developed a Remedial Work Plan that included removal of separate phase product and implementation of in-situ chemical oxidation via hydrogen peroxide injections to further reduce contaminants in soil and groundwater. Remedial action also included asbestos abatement and building. The Site received a “no further action” letter and has been developed as a retail bank.

True Bethel Baptist Church – Technical Consultant
Senior Project Manager on the NYSDEC first ever Technical Assistance Grant (TAG) to a community group impacted by a brownfield site. Reviewed site technical documents, attended public meetings and interacted on behalf of the community with NYSDEC and its representatives and contractors on the Site.

JOHN A. SCHENNE, P.E.

REGISTRATION

Registered Professional Engineer -- Texas, New York and Florida
Licensed Fire Protection II Contractor - Florida

EDUCATION/ TRAINING

BS - Civil Engineering - Clarkson University (1975)
BA - Geology - State University of New York at Potsdam (1976)
MS - Environmental Engineering - Clarkson University (1977)
Architectural and Planning Courses - State University of New York at Buffalo (1982-87)
U.S. Army Corps of Engineers – Engineer Officer Basic Course (1977)
Earth and Rock fill Dam Construction (1979)
Contract Management (1979)
Oil Field and Hazardous Environment Safety (1986)
Petroleum Production Repair (1984-1986)
Engineer Officer Advanced Course (1987)
U.S. Army Medical Service Corps – Officer Advanced Course (1993)

PUBLICATIONS

Earthen Manure Storage Design Considerations, US NRCS, 1997, co Author

MILITARY EXPIERENCE

23 years of experience, 2LT thru LTC, USAR officer, retired 1999 as 0-5. Various staff and command positions including Equipment officer responsible the maintenance of 4000 Army vehicles, to include Humves, Trucks to 80 ton, heavy equipment, bridging equipment, NBC decontamination equipment, repair equipment, generators air compressors, and various other diesel and gas fire equipment. I was also a safety engineer for the US Army for 12 years.

EXPERIENCE SUMMARY

Thirty five years of professional experience in design, construction, and management of multi-disciplined projects involving major earthworks, tunnels, buildings, treatment plants, and site developments. Responsibility as Project Engineer/Manager for feasibility, environmental, and design studies, supervision of field and laboratory investigations, field inspections, providing technical support, and liaison with regulatory agencies. Areas of experience and training include: Environmental Engineering,

Sanitary Engineering, Hydrology, Geological Exploration and Mapping; Site Investigation and Assessment, Hazardous Waste Remediation & Testing; Earthwork; Rock Excavation and Blasting; Concrete Design and Construction; Structural Design; Mechanical Design, Corrosion Protection; Facility Planning and Design, and Construction Management.

As a Licensed Fire Protection Contractor I have designed hundreds of water and chemical based fire sprinkler systems and coordinated the work with various fire departments and water utilities. I am familiar with NFPA specifications and codes including rating and testing of potable water systems and fire services. I am very familiar with the New York State Building Code as it relates to fire safety in structures.

KEY PROJECTS

Project-Engineer - Responsible for Draft Environmental Impact Study for 100 unit Residential Development in Orchard Park, New York. Work included traffic studies and investigation of Electro-Magnetic Radiation near power lines.

Project Engineer-Responsible for completion of a chrominum contamination study on twenty (20) miles of Cattaraugus Creek.

Project Engineer – Phase II Environmental hazardous waste investigation and remediation for the Seneca Nation of Indians Elderly Housing Complex, (former U.S. Leather Tannery Site).

Project Engineer - Responsible for the design and construction certification for the U. S. Army Corps of Engineers for over 80 miles of small diameter (four to eight inch) water and sewer lines. Work included approximately 50 lift stations, three 50,000 gpd package water treatment plants, and five land application sewage treatment systems.

Design Engineer - Responsible for the structural design of a high capacity sewage lift station handling extremely corrosive industrial sewage. Project was designed using 8000 psi chemically resistant concrete.

Project Engineer - Responsible for repairs to a 200 mgd water intake in Buffalo Harbor for the City of Buffalo. Repairs included underwater grouting of a 110 year old concrete foundation and installation of a zebra mussel suppression system.

Senior Design Engineer - Erie County Water Authority Sturgeon Point Water Treatment Plant, upgrade of sedimentation basins, sludge removal system and rehabilitation of rapid sand filters at a 100 mgd water plant.

Senior Design Engineer - Responsible for plant and structural design of slow sand water filtration plants at Ripley and Woodridge, New York. Plant sizes 0.3 mgd and 0.5 mgd

Project Engineer - Underwater inspection and emergency repairs to 70 mgd, 90 year old concrete and timber drinking water intake in the Niagara River for the City of Niagara Falls. Work included analysis of intake structure to resist dynamic water and ice loads

Design Engineer - Responsible for investigations and preparation of Phase I Site Assessments for Residential and Commercial Properties in Western New York.

Design Engineer - Responsible for foundation design for a 100 foot tall 300,000 gallon elevated water storage tank.

Design Engineer – Prepared design specifications for more than 50 fire pumps and more than 200 fire sprinkler systems in New York and Florida.

Design Engineer – Prepared designs for 10 –FM 200 fire suppression systems

Design Engineer – Prepared designs for s more than 250 commercial fire detection and alarms systems.

HAZARD EVALUATIONS

C. Mark Hanna, CHMM
President, Principal

Mr. Hanna has over 34 years of experience in environmental pollution control and health/safety services. As principal for Hazard Evaluations, Inc., Mr. Hanna is responsible for all technical services. He specializes in hazardous materials/wastes management, site assessment and remediation, industrial compliance auditing, chemical exposure assessment, safety program development and implementation, and Process Safety Management and Risk Management Planning programs.

Mr. Hanna's career has included over 40 federal/state Superfund projects and over 1,500 due diligence projects. His industrial experience focuses on air, water, waste and chemical management compliance aspects at metal working, wood working, foundry, electroplating, printing and food production facilities.

Education

B.A., 1975, Biology, S.U.C. at Oswego, N.Y.

M.S., 1977, Natural Sciences (Toxicology Concentration), S.U.N.Y. at Buffalo, N.Y.

MEPC, 1982, Pollution Control, Pennsylvania State University

M.S., 1983 Forest Hydrology (Hydrogeology Minor), Pennsylvania State University

Professional Registrations

1985, Certified Hazardous Materials Manager, Senior Level

1989-1998, Registered Environmental Professional

1997, Certified Hazardous Materials Manager, Master Level

Key Skills

- Industrial Emission Permits and Controls
- Hazardous/Solid Waste Management
- Industrial Wastewater Pretreatment and Discharge Permits
- Waste Reduction and Pollution Prevention Programs
- Petroleum and Chemical Bulk Storage
- Industrial Stormwater Management
- Environmental Site Assessments
- Environmental Compliance Assessment
- Industrial Risk Management Program and Audit
- Remedial Investigations
- Brownfield Cleanup Program
- Budgeting & Cost Controls

Affiliations and Certifications

Academy of Hazardous Materials Management, Member
Erie County Local Emergency Planning Committee, Member
New York Water Environment Association, Member
International Institute of Ammonia Refrigeration, Member
OSHA 40 Hour 29 CFR 1910. (HAZWOPER) Certification

Environmental Project Highlights

- Performed site characterization for subsurface TCE contamination from historical improper disposal via septic system. Developed Interim Remedial Measures and Remedial Alternatives Reports and Work Plan for this Voluntary Brownfield Cleanup. Installed two banks of piezometers to allow both extraction of contaminated groundwater and injection of Potassium permanganate using continuously operating metering pumps. Recovered over 60 gallons of free product and significantly reduced contamination in groundwater in one year.

- Project Manager for the remediation of numerous (85+) underground petroleum storage tank sites located throughout Western New York. The primary method of remediation has been excavation/removal with appropriate management of tank contents and/or residues, cleaning and scrapping of the tanks and piping, and site restoration. Where petroleum releases were detected, excavation/removal of contaminated soil/fill was completed the majority of the time, with soil management including off-site disposal or on-site bio-treatment. In several cases, on-site vapor extraction systems or chemical oxidation systems with groundwater monitoring have been installed as the recommended remedial method.

- Project Manager for industrial site restoration project which involved the characterization of Lead-contaminated kiln brick surfaces. Appropriate characterization allowed demolition debris from kiln to be disposed of in-place on-site as solid waste material as authorized by NYSDEC. Area was then backfilled with structural flowable fill to allow reuse of floor space for manufacturing.

- Completed investigation and remediation (excavate and remove) of subsurface Lead contamination at an historical industrial site in Buffalo (NY).

- Project Manager for non-hazardous aspects of site remediation at former Frontier Chemical-Pendleton Site. Remedial tasks included sampling/analysis of wastes, emptying, cleaning and scrapping of bulk storage tanks and collecting/disposing of various on-site residuals.

- Project Manager for the installation of groundwater monitoring wells at AL Tech Specialty Steel's solid waste management unit located in Watervliet, NY. Prepared Closure Plan and Bid Specifications for the related RCRA surface impoundment. Addressed technical impact of surface run-off from adjacent landfill, steep terrain and on-site source for cover material. Prepared response package required by NYSDEC regarding the basis of design and construction practices completed during closure.

- Project Manager for the remediation of a cutting oil spill at a Lockport, NY machine shop. Cleanup activities included an underground storage tank removal, scarification of surface soils and inoculation of contaminated soils with petroleum biodegrading bacteria. Responsibilities included coordination of subcontractors, soil sampling, and preparation of report certifying contamination removal.

- Project Manager for industrial site restoration project for solid waste materials abandoned on-site in the on-site production of flowable fill as authorized by a NYSDEC Beneficial Use Determination. Flowable fill produced was used as structural fill to backfill subfloor tanks and large vaults to grade within the facility to allow reuse of the floor space. Tasks included CBS-registered process tank fluid removal and management, basement vault water management, chemical lab packing and disposal, PCBs-contaminated concrete characterization and disposal, UST closure and soil management, scrap and demolition debris management, and subsequent SEQR filing and Phase I Environmental Site Assessment.

Regulatory Compliance Project Highlights

- Project Manager for the development of numerous Process Safety Management and/or Risk Management Plan programs utilizing anhydrous ammonia for refrigeration, including Sorrento Lactalis, Inc.'s South Park (Buffalo, NY), Goshen, NY, Nampa, ID and San Jose, CA facilities, Upstate Niagara Cooperative, Inc.'s Culture (West Seneca, NY), Dale Road (Cheektowaga, NY) and Fulton (Rochester, NY) facilities, as well as Rosina Foods, Inc. (West Seneca, NY), Steuben Foods, Inc. (Elma, NY), Elmhurst Dairy, Inc. (Jamaica, NY), and Sodus Cold Storage, Inc. (Sodus, NY). Responsibilities included coordinating written program preparation, Process Hazard Analysis development, preparing release scenarios, evaluating and upgrading SOPs, developing MOC methods, etc.

- Provided consulting services to over 75 facilities nationwide regarding SARA Title III reporting requirements. Services included regulations and process reviews, mass balance calculations, purchasing and process data evaluation, database development and USEPA Tier Two and Form R preparation.

- Project Manager for numerous environmental compliance audits including, Mod-Pac Corp., Buffalo, NY (commercial printing), Sahlen Packing Co., Inc., Buffalo, NY (meat packing), Upstate Niagara Cooperative, Inc., Buffalo, NY (dairy products), MoldTech, Inc., Lancaster, NY (plastics), Sorrento Lactalis, Inc., Buffalo, NY (cheese manufacturing), Chautauqua Hardware Corp., Jamestown, NY (brass hardware), Thomson Professional Publishing, Webster, NY (printed media), Buffalo China, Inc., Buffalo, NY (lead glazed china), Brainerd Manufacturing Co., East Rochester, NY (electroplating and finishing), Falconer Die Casting Co., Inc., Lakewood, NY (aluminum and zinc casting), and Jensen Fittings Corp., North Tonawanda, NY (stainless pipe fittings). These audits emphasized the inspection of all manufacturing operations, hazardous materials and hazardous waste handling, wastewater treatment operations, air emissions and facility records to evaluate current practices with regard to RCRA, SARA, New York State Parts 200 (air), 360 (solid waste) and 370 (hazardous waste) regulations, USEPA Categorical Pretreatment Standards, UIC NESHAP & CFATS regulations, New York State SPDES regulations, and local sewer authority and fire and building department codes.

- Oversaw the modification of an industrial wastewater pre-treatment system for Whiting Door Manufacturing. Evaluated plant manufacturing wastewater sources, modified existing pretreatment system, developed wastewater pretreatment schedule, and completed wastewater discharge monitoring. Developed a Toxic Organics Management Plan to reduce cost of wastewater monitoring. Evaluated and assisted with the revision of municipal Industrial User Permit.

- Project Manager for Title V Clean Air Act permit development for Whiting Door Manufacturing Corp., Dinaire, Inc., Metalico Aluminum Recovery, Inc. and Flexo Transparent, Inc. Continued services include annual emission statements, 12-month rolling emissions determinations and semi-annual compliance reporting.

- Project Manager for Clean Air Act and/or NYSDEC Part 228 determinations and State Air Facility Permit or Air Facility Registration development for numerous industrial clients including Niagara Ceramics Corporation, Buffalo Metal Casting Co., Inc., ITT Standard/XYLEM, Metalico Rochester, Inc., Ulrich Planfiling Equipment Corp., United Silicone, Inc., U.S. Chrome Corp., Metalico Aluminum Recovery, Inc., Truck-Lite Co., Inc., Jensen Fittings Corp., API Delavan, Inc., Tapecon Inc., Dura-Plating, Inc., Buffalo China, Inc., Forsyth Industries, Inc., Jamestown Laminating Co., Classic Brass Inc., Ivaco Steel Processing (New York), LLC, Innovative Tool & Machine Co., Inc., and Whiting Door Manufacturing, Inc.

Attachment 2

Field Forms

Wittman GeoSciences, PLLC
3636 N. Buffalo Road, Orchard Park, NY 14127
michelewittmangeo@gmail.com 716-574-1513

Boring No:

Project Name & Location _____ WGS Representative: _____

WGS Project Number: _____ WGS Reviewed & Approved by: M. Wittman, P.G.

Start Date _____ End Date _____ Drilling Contractor _____

GW Depth While Drilling _____ Type of Drill Rig _____

GW Depth at Completion _____ Sampler Type: _____

Sample Depth (ft)	Sample No.	Sample Depth (feet)	Recovery (%)	SAMPLE DESCRIPTION	OVM Reading (ppm)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
22					
24					

Notes:	1) Organic vapor meter used to field screen and headspace soil samples. 2) ND - non detect on OVM
General Notes:	1) Stratification lines represent approximate boundary between soil. Transitions may be gradual. Depths are approximate. 2) Groundwater (GW) depths approximate at time of sampling. Fluctuations in groundwater may occur. 3) f=fine; m=medium; c=coarse 4) and (36-50%); some (21-35%); little (11-20%); trace (1-10%)

MC - Geoprobe Macrocore SS - Split Spoon SH - Shelby Tube BC - Bedrock Core

HAZARD EVALUATIONS

Date: _____ Project No.: _____

Client: _____

Project: _____

Site: _____

Weather: _____

3752 N. Buffalo Rd.
Orchard Park, NY 14127
P (716) 667-3130
F (716) 667-3156

FIELD INVESTIGATION REPORT

(Start typing here making sure underline is on and text is justified. Hit tab at the end of the very last row to extend the underline to the right margin).

Signature _____ Title _____

Well Data Sheet

Date: Job #:

Crew:

Well Depth:

Initial *Phase* Level:

Initial *Water* Level:

Volume Calculation:

DTB-DTW*_____=1-well vol

Purge Record

Time	Volume	pH	Cond.	Temp.	Turbidity

Purge Method: Bailer/Submersible Pump

Initial Water Quality

Final Water Quality

SAMPLE RECORD

Date:

Time:

Crew:

Method:

Sample ID:

Water Quality:

pH:

Conductivity:

Temperature:

Turbidity:

Volume:

Analysis:

Chain of Custody #:

Sample Type:

Diameter	Multiply by
1"	0.041
2"	0.163
3"	0.367
4"	0.653
6"	1.468
8"	2.61

Comments:

Signature:

NEW YORK CHAIN OF CUSTODY

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page
of

Date Rec'd in Lab

ALPHA Job #

Client Information
Client:
Address:
Phone:
Fax:
Email:

Project Information
Project Name:
Project Location:
Project #
(Use Project name as Project #) ☐
Project Manager:
ALPHAQuote #:

Turn-Around Time
Standard ☐ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables
☐ ASP-A ☐ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement
☐ NY TOGS ☐ NY Part 375
☐ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Billing Information
☐ Same as Client Info
PO #

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
☐ **Done**
☐ **Lab to do**
Preservation
☐ **Lab to do**
(Please Specify below)

Total Bottle

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	**Sample Specific Comments**

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Soil Vapor Intrusion - Structure Sampling Building Questionnaire **Structure ID :** _____

Site No. : _____ **Site Name** : _____

Date: _____ **Time:** _____

Structure Address : _____

Preparer's Name & Affiliation : _____

Residential ? ☐ **Yes** ☐ **No** **Owner Occupied ?** ☐ **Yes** ☐ **No** **Owner Interviewed ?** ☐ **Yes** ☐ **No**

Commercial ? ☐ **Yes** ☐ **No** **Industrial ?** ☐ **Yes** ☐ **No** **Mixed Uses ?** ☐ **Yes** ☐ **No**

Identify all non-residential use(s) : _____

Owner Name : _____ **Owner Phone** : ( ) _____ - _____

Secondary Owner Phone : ( ) _____ - _____

Owner Address (if different) : _____

Occupant Name : _____ **Occupant Phone** : ( ) _____ - _____

Secondary Occupant Phone : ( ) _____ - _____

Number & Age of All Persons Residing at this Location : _____

Additional Owner/Occupant Information : _____

Describe Structure (style, number floors, size) : _____

_____

Approximate **Year Built** : _____ Is the building **Insulated**? ☐ Yes ☐ No

Lowest level : ☐ Slab-on-grade ☐ Basement ☐ Crawlspace

Describe Lowest Level (finishing, use, time spent in space) : _____

_____

Floor Type: ☐ Concrete Slab ☐ Dirt ☐ Mixed : _____

Floor Condition : ☐ Good (few or no cracks) ☐ Average (some cracks) ☐ Poor (broken concrete or dirt)

Sumps/Drains? ☐ Yes ☐ No Describe : _____

Identify other floor penetrations & details : _____

_____

Wall Construction : ☐ Concrete Block ☐ Poured Concrete ☐ Laid-Up Stone

Identify any wall penetrations : _____

_____

Identify water, moisture, or seepage: location & severity (sump, cracks, stains, etc) : _____

_____

Heating Fuel : ☐ Oil ☐ Gas ☐ Wood ☐ Electric ☐ Other : _____

Heating System : ☐ Forced Air ☐ Hot Water ☐ Other : _____

Hot Water System : ☐ Combustion ☐ Electric ☐ Boilermate ☐ Other: _____

Clothes Dryer : ☐ Electric ☐ Gas Where is dryer **vented** to? _____

If combustion occurs, describe where air is drawn from (cold air return, basement, external air, etc.) : _____

_____

Fans & Vents (identify where fans/vents pull air from and where they vent/exhaust to) : _____

_____

Describe factors that may affect indoor air quality (chemical use/storage, unvented heaters, smoking, workshop):

Attached garage ? ☐ Yes ☐ No Air fresheners ? ☐ Yes ☐ No

New carpet or furniture ? ☐ Yes ☐ No What/Where ? _____

Recent **painting** or **staining** ? ☐ Yes ☐ No Where ? : _____

Any **solvent** or **chemical-like** odors ? ☐ Yes ☐ No Describe : _____

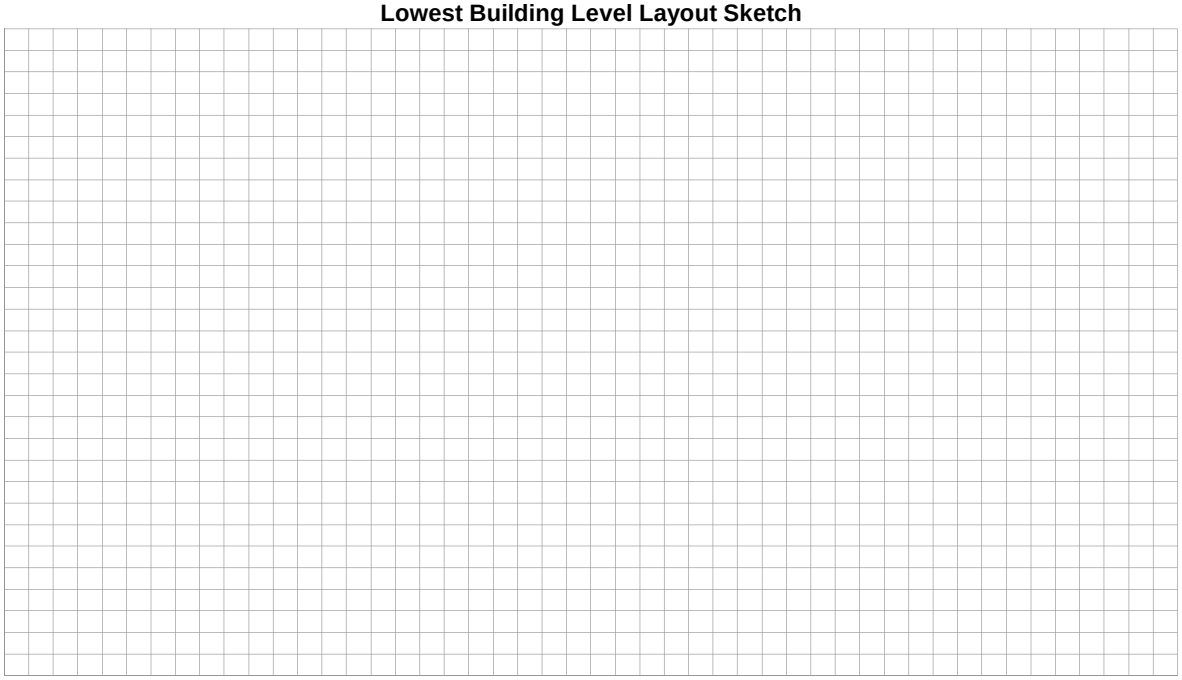
Last time **Dry Cleaned** fabrics brought in ? _____ What / Where ? _____

Do any building occupants use solvents at work ? ☐ Yes ☐ No Describe : _____

Any testing for Radon ? ☐ Yes ☐ No Results : _____

Radon System/Soil Vapor Intrusion Mitigation System present ? ☐ Yes ☐ No If yes, describe below

Lowest Building Level Layout Sketch



- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sketch.
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or **F**	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	**xxxxxxx**	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	######	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab vapor samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

Structure Sampling - Product Inventory

Homeowner Name & Address: _____ **Date:** _____

Samplers & Company: _____ **Structure ID:** _____

Site Number & Name: _____ **Phone Number:** _____

Make & Model of PID: _____ **Date of PID Calibration:** _____

Identify any Changes from Original Building Questionnaire : _____

Product Name/Description	Quantity	Chemical Ingredients	PID Reading	Location

HAZARD EVALUATIONS

AIR/VAPOR SAMPLING FIELD DATA SHEET

Client: _____ Project No.: _____

Site Name & Address: _____

Person(s) Performing Sampling: _____

Sample Identification: _____

Sample Type: ☐ Indoor Air (ambient) ☐ Outdoor Air ☐ Soil Vapor ☐ Sub-slab Vapor

Date of Collection: _____ Setup Time: _____ Stop Time: _____

Sample Depth: _____

Sample Height: _____

Sampling Method(s) & Device(s): _____

Purge Volume: _____

Sample Volume: _____

Sampling Canister Type & Size (if applicable): _____

Canister # _____ Regulator # _____

Vacuum Pressure of Canister Prior to Sampling: _____

Vacuum Pressure of Canister After Sampling: _____

Temperature in Sampling Zone: _____

Apparent Moisture Content of Sampling Zone: _____

Soil Type in Sampling Zone: _____

Standard Chain of Custody Procedures Used for Handling & Delivery of Samples to Laboratory:

☐ Yes ☐ No. If no, provide reason(s) why? _____

Laboratory Name: _____

Analysis: _____

Comments:

_____

_____

_____

_____

Sampler's Signature _____ Date: _____

Attachment 3

Emergent Contaminant Sampling and Laboratory Analysis

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

GUIDELINES FOR SAMPLING AND ANALYSIS OF PFAS

Under NYSDEC's Part 375 Remedial Programs

January 2020

www.dec.ny.gov

Contents

ERRATA SHEET for

Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Program
Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date

January 2020

Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis and reporting of PFAS, DER has developed this document to summarize procedures and update previous DER technical guidance pertaining to PFAS.

Applicability

Sampling for PFAS has already been initiated at numerous sites under DER-approved work plans, in accordance with specified procedures. All future work plans should include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day or one per twenty samples, whichever is more frequent.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10.

Water Sample Results

PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt). In addition, further assessment of water may be warranted if either of the following screening levels are met:

a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or
b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L

If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase.

Sites in the site management phase should evaluate for PFAS to determine if modification to any components of the SMP is necessary (e.g., monitoring for PFAS, upgrading treatment facilities, or performing an RSO).

Testing for Imported Soil

Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the *PFAS Analyte List* (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs.

If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Analysis and Reporting

As of January 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix F) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS in matrices other than finished drinking water. However, laboratories analyzing environmental samples for PFAS (e.g., soil, sediments, and groundwater) under DER's Part 375 remedial programs need to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537.1 or ISO 25101. Laboratories should adhere to the guidelines and criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids). Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist.

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay). Commercially methods are also available for biota and air samples.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.

Please note that TOP Assay analysis of highly-contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
    - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP-approved lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an "Analytical Methods/Quality Assurance Summary Table" specifying:
    - Matrix type
    - Number or frequency of samples to be collected per matrix
    - Number of field and trip blanks per matrix
    - Analytical parameters to be measured per matrix
    - Analytical methods to be used per matrix with minimum reporting limits
    - Number and type of matrix spike and matrix spike duplicate samples to be collected
    - Number and type of duplicate samples to be collected
    - Sample preservation to be used per analytical method and sample matrix
    - Sample container volume and type to be used per analytical method and sample matrix
    - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by LC-MS/MS for PFAS using methodologies based on EPA Method 537.1
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
    - Reporting Limits should be less than or equal to:
        - Aqueous – 2 ng/L (ppt)
        - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537.1, EPA Method 533, or ISO 25101
- Include detailed sampling procedures
    - Precautions to be taken
    - Pump and equipment types
    - Decontamination procedures
    - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification. Previous results of "non-detect" for PFAS from the UCMR3 water supply testing program are acceptable as verification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., wash room sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled “General Fish Handling Procedures for Contaminant Analysis” (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

   1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

   2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

   3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

   1. Project and Site Name.

   2. DEC Region.

   3. All personnel (and affiliation) involved in the collection.

   4. Method of collection (gill net, hook and line, etc.)

   5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

   1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

   2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

   3. Date collected.

   4. Sample location (waterway and nearest prominent identifiable landmark).

   5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate "Age" column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish's tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:

No materials containing Teflon.
No Post-it notes.
No ice packs; only water ice or dry ice.
Any gloves worn must be powder free nitrile.
No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
Wash hands after handling any food containers or packages as these may contain PFCs.
Keep pre-wrapped food containers and wrappers isolated from fish handling.
Wear clothing washed at least six times since purchase.
Wear clothing washed without fabric softener.
Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with "fluor" in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name _____ DEC Region _____

Collections made by (include all crew) _____

Sampling Method: □Electrofishing □Gill netting □Trap netting □Trawling □Seining □Angling □Other _____

Preservation Method: □Freezing □Other _____ Notes (SWFDB survey number): _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, _____, of _____ collected the
(Print Name) (Print Business Address)

following on _____, 20____ from _____
(Date) (Water Body)

in the vicinity of _____
(Landmark, Village, Road, etc.)

Town of _____, in _____ County.

Item(s) _____

_____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on _____, 20_____.

_____ _____
Signature Date

I, _____, received the above mentioned sample(s) on the date specified and assigned identification number(s) _____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

_____ _____
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) developed the following guidelines for laboratories analyzing environmental samples for PFAS under DER programs. If laboratories cannot adhere to the following guidelines, they should contact DER's Quality Assurance Officer, Dana Maikels, at dana.maikels@dec.ny.gov prior to analysis of samples.

Isotope Dilution

Isotope dilution techniques should be utilized for the analysis of PFAS in all media.

Extraction

For water samples, the entire sample bottle should be extracted, and the sample bottle rinsed with appropriate solvent to remove any residual PFAS.

For samples with high particulates, the samples should be handled in one of the following ways:

1. Spike the entire sample bottle with isotope dilution analytes (IDAs) prior to any sample manipulation. The sample can be passed through the SPE and if it clogs, record the volume that passed through.
2. If the sample contains too much sediment to attempt passing it through the SPE cartridge, the sample should be spiked with isotope dilution analytes, centrifuged and decanted.
3. If higher reporting limits are acceptable for the project, the sample can be diluted by taking a representative aliquot of the sample. If isotope dilution analytes will be diluted out of the sample, they can be added after the dilution. The sample should be homogenized prior to taking an aliquot.

If alternate sample extraction procedures are used, please contact the DER remedial program chemist prior to employing. Any deviations in sample preparation procedures should be clearly noted in the case narrative.

Signal to Noise Ratio

For all target analyte ions used for quantification, signal to noise ratio should be 3:1 or greater.

Blanks

There should be no detections in the method blanks above the reporting limits.

Ion Transitions

The ion transitions listed below should be used for the following PFAS:

PFOA	413 > 369
PFOS	499 > 80
PFHxS	399 > 80
PFBS	299 > 80
6:2 FTS	427 > 407
8:2 FTS	527 > 507
N-EtFOSAA	584 > 419
N-MeFOSAA	570 > 419

Branched and Linear Isomers

Standards containing both branched and linear isomers should be used when standards are commercially available. Currently, quantitative standards are available for PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As more standards become available, they should be incorporated in to the method. All isomer peaks present in the standard should be integrated and the areas summed. Samples should be integrated in the same manner as the standards.

Since a quantitative standard does not exist for branched isomers of PFOA, the instrument should be calibrated using just the linear isomer and a technical (qualitative) PFOA standard should be used to identify the retention time of the branched PFOA isomers in the sample. The total response of PFOA branched and linear isomers should be integrated in the samples and quantitated using the calibration curve of the linear standard.

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated for each target analyte and the ratio compared to standards. Lab derived criteria should be used to determine if the ratios are acceptable.

Reporting

Detections below the reporting limit should be reported and qualified with a J qualifier.

The acid form of PFAS analytes should be reported. If the salt form of the PFAS was used as a stock standard, the measured mass should be corrected to report the acid form of the analyte.

Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report. Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Maikels, at dana.maikels@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 14 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of five standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%. Linear fit calibration curves should have an R^2 value greater than 0.990.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
R^2 >0.990	J flag detects and UJ non detects
Low-level calibration check <50% or >150%	J flag detects and UJ non detects
Mid-level calibration check <70% or >130%	J flag detects and UJ non detects

Initial Calibration Verification

An initial calibration verification (ICV) standard should be from a second source (if available). The ICV should be at the same concentration as the mid-level standard of the calibration curve.

ICV recovery <70% or >130%	J flag detects and non-detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated from the standards for each target analyte. Lab derived criteria should be used to determine if the ratios are acceptable. If the ratios fall outside of the laboratory criteria, qualify results as an estimated maximum concentration.

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Branched and Linear Isomers

Observed branched isomers in the sample that do not have a qualitative or quantitative standard should be noted and the analyte should be qualified as biased low in the final data review summary report. Note: The branched isomer peak should also be present in the secondary ion transition.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

APPENDIX E

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

BROWNFIELD CLEANUP PROGRAM
For
140 Chandler Street, LLC
Western Portion of 140 Chandler Street Site, 140 Chandler Street, Buffalo, New York 14207
BCP # C915354

Prepared For:
140 Chandler Street, LLC
391 Washington Street, Buffalo, New York 14203
WGS Project No: 19211

Prepared By:
Wittman GeoSciences, PLLC
3636 North Buffalo Road
Orchard Park, New York 14127
716-574-1513

January 9, 2020 rev March 30, 2020

WITTMAN
GeoSciences, PLLC

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1.0 INTRODUCTION

This Health & Safety Plan (HASP) has been developed for the Remedial Investigation/ Alternatives Analysis Report (RI/ AAR) to be completed by Wittman GeoSciences, PLLC (WGS) behalf of 140 Chandler Street, LLC (Applicant) as part of the Brownfield Cleanup Program (BCP). The 140 Chandler Street Site is in the process of being divided into two parcels, including Western Portion, identified as SBL #77.84-4-4.1; and Eastern Portion, identified as SBL #77.84-4-4.42. This QAPP will address work for the Western Portion of 140 Chandler Street Site (Western Portion) only.

The proposed work will include completion of soil borings, test pits, installation of monitoring wells, soil and groundwater sampling, soil excavation and sampling, and report preparation. Such activities mandate the performance of tasks with a potential to expose remediation workers to various environmental contaminants previously identified on-site, primarily involving historical industrial fill potentially including semi-volatile organic compounds (SVOCs) and metals. Limited exposure potential may be related to commercial substances used for equipment decontamination. A general listing of the work tasks to be completed is as follows:

1. Soil sampling using a direct push method (Geoprobe) and hollow stem auger equipment
2. Test pit excavation with a track mounted excavator and bucket
3. Soil sample collection and analysis
4. Monitoring well installation, purging and development
5. Groundwater sampling using disposable bailers, and analysis
6. Soil vapor intrusion sampling and analysis

The intent of this HASP is to identify and present appropriate safety procedures to be followed by investigation/remediation workers involved with project activities throughout the performance of the RI. Such procedures are designed to reduce the risk of remediation worker exposure to the primary substances of concern.

The procedures also address several other physical hazards that may be encountered during the RI activities. Recommended safety procedures presented herein may be modified as the RI proceeds based upon conditions encountered at the site, with the mutual agreement of WGS, NYSDEC, NYSDOH and Applicant. A copy of this HASP (including any modifications) will be maintained on-site throughout the RI field work to be used as a reference by WGS and their subcontractors. An initial safety meeting will be conducted at the site prior to the initiation of the sampling activities to inform all affected remediation workers of potential exposures and hazards.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The site is addressed as Western Portion of 140 Chandler Street in the City of Buffalo, Erie

County, New York and consists of one parcel totaling approximately 0.5 acres of land. The site is bound to the north by railroad tracks, to the south by Chandler Street, to the west by commercial operator (J&D's Seal Tech), and to the east by vacant land, a commercial structure, with occupants including Tappo Restaurant, Thin Man Brewery, ODL Ortho Lab, and a salon and fitness center The property is located within an urban area, utilized for industrial, commercial, and residential purposes. The site contains three buildings. Building 1 includes approximately 2,500 square foot one-story concrete block building. Building 2 is an approximate 1,000-sqaure foot one-story concrete block building. Building 3 is a two story, approximate 1,500 square foot building with transite walls and roofing. Building 3 was formerly utilized as a compounding building, containing six ASTs of various sizes that currently remain on-site. Building 2 and 3 are planned for cleanout and demolition.

2.2 Site History

The western portion of the site was originally constructed in 1911 by Faramel Manufacturing Company, a feed mill manufacturing company, and included several buildings. By 1940, the western portion was inhabited by EJ Woodison company, a plating manufacturing facility, occupied from at least 1964 to 1980. The central and eastern portion of the site was constructed in 1914 by Enterprise Oil company, a soap and compounds of lubricating oils manufacturing company. Building 3, was formerly a compounding building, utilized for the mixing of various oils and/or lubricants. The feed mill buildings were demolished in the 1950s, and current Buildings 1 and 2 were constructed in 1965 and used by Quaker State Oil Refining Company until about 1989.

Since that time, various companies occupied the buildings including Cream of Peas Company, Inc., Quaker State Oil Refining Corporation, EJ Woodison Co., Quality Petroleum Products, Inc., LASCO, Inc., and Niagara Lubricants. Over fifty-eight (58) known storage tanks, both located underground and aboveground, were historically located at the site since at 1933, with the most recent tank closure in 2005. The building addressed as 160-164 Chandler Street, which occupied the entire eastern half of the site, was most recently occupied by Niagara Lubricants and was destroyed by a fire in the summer of 2011. Following building demolition associated with the fire, the various tanks were removed, and the former building area was backfilled. The site has been vacant since that time.

During due diligence work prior to property purchase, Hazard Evaluations Inc. completed a limited Phase II investigation for Signature Development at the property in May 2019. The work included completion of 16 soil borings, three test pits and collection of soil and groundwater samples, at locations shown on Figure 3. Soil boring locations SB9 to SB16, as well as TP1 and TP3 were completed on the Western Portion. Based on this limited investigation, the primary contaminants of concern in the soil/fill profile include semi-volatile organic compounds (SVOCs), and metals. Appendix A includes the sample location figure, tables summarizing analytical data and soil boring logs from the May 2019 investigation. A final report was not created for the Phase II work. The Phase II testing identified SVOCs throughout various areas of the site at concentrations exceeding restricted residential, commercial, and industrial standards.

3.0 ASSIGNED RESPONSIBILITIES

Specific safety responsibilities have been established for the performance of the RI as indicated below:

3.1 Environmental Health & Safety Manager

The Environmental Health & Safety Manager (EHSM) has the authority to commit any resources necessary to implement an effective RI/IRM safety program, thereby protecting the health of affected site workers. The EHSM will delegate responsibilities, as necessary, to the Project Manager (PM) in order to facilitate various aspects of this HASP. The resolution of any on-site safety issues encountered during the RI/IRM will be coordinated by the EHSM.

3.2 Project Manager

The Project Manager (PM) will be responsible for the overall project including implementation of the HASP. The PM will coordinate with the Site Safety Officer (SSO) to ensure that project goals of the project are met in a manner consistent with the HASP requirements.

3.3 Site Safety Officer

The Site Safety Officer (SSO) will be responsible for ensuring that the recommended safety procedures are followed during sampling activities. The SSO will supervise HEI/WGS employees and subcontractors throughout the field work. The SSO is knowledgeable of general construction safety practices and remediation worker protection techniques. Responsibilities will include:

- Ensuring day to day compliance with HASP safety procedures;
- Maintaining adequate PPE supplies
- Calibration and maintenance of monitoring instruments
- Authority to stop work activities any time unsafe work conditions are identified;
- Implementing personnel decontamination procedures;
- Initiate emergency response procedures; and
- Maintain a diary of activities with safety relevance;
- Establishing and assuring adequate records of all:
  - Occupational injuries and illnesses;
  - Accident investigations;
  - Reports to insurance carrier or state compensation agencies;
  - Records and reports required by local, state and/or federal agencies;
  - Property or equipment damage.

3.4 Site Workers

Affected site workers will include WGS employee and subcontractor employees. Site workers must comply with aspects of the HASP and its safety procedures. Personnel entering the site will have completed training requirements for hazardous waste site operations in accordance with OSHA 29CFR 1910.120 (c); 29CRF 1910.146 (d) and 29CFR 1910.147 (c). Site workers and SSO must have completed appropriate medical surveillance as required by OSHA 29CRF 1910.120(f).

3.5 Subcontractors

Various subcontractors will be utilized on the site during RI/IRM activities, such as driller and excavation contractor. Subcontractors are responsible for development of their own HASP that is at least as stringent. A copy of this HASP will be provided to the subcontractors for information purposes. Subcontractors will be informed of potential health and safety hazards, as well as environmental monitoring data collected during field activities.

4.0 TRAINING and SAFTETY MEETINGS

4.1 Training

Site personnel assigned to the site will be in compliance with the training requirements of 29 CFR 1910and 1926 as listed below. Site personnel will have met one of the following requirements prior to the start of on-site activities.

- A 40 hour minimum hazardous materials safety and health course, as stipulated in 29 CFR 1926.65 e(3); and
- An 8 hour minimum refresher course per year after the 40 hour minimum training has occurred (29 CFR 1926.65.e[8]).

On-site managers and supervisors must be in compliance with the additional supervisory training requirements of 29 CFR 1926.65.e(4). Emergency responders must be in compliance with the additional training requirements of 29 CFR 1926.65.e(7). Appropriate certificates of participating in training programs will be maintained at WGS offices.

4.2 Safety Meetings

Site workers and subcontractors will be familiar with the site and facility layout, have an understanding of known and potential hazards, and details within this HASP. On-site safety meetings will occur daily, or as needed to assist site workers and subcontractors in conducting activities safely. Attending personnel must sign an attendance sheet. Site workers must attend a safety meeting prior to being allowed to work on-site.

5.0 PERSONAL PROTECTIVE EQUIPMENT

An important aspect for site worker safety is correct selection of personal protective equipment (PPE). The levels of protection listed below are based on 29 DFR 1910.120. The majority of site activities will be conducted in Level D protection. This level of protection was selected based on the types and measured concentrations of the hazardous substances in the samples previously collected and their associated hazards and/or toxicity; and potential or measured exposure to substances in air, splashes of liquids or others indirect contact with material due to the task being performed.

- Level D will generally consist of the following:
  - Coveralls; or long pants and long sleeve shirt to provide protection from dermal contact with soil
  - High visibility safety vest
  - Steel toe work boots
  - Safety glasses
  - Hard hat
  - Chemical-resistant gloves

  Additional equipment can be donned at SSO requirements, including disposable boots, hearing protection, safety vest, or disposable outer chemical coveralls (Tyvek suits).

- Level C will generally consist of the following:
  - Full or half face air purifying respirator (APR) equipped with appropriate organic vapor canisters and/or other chemical cartridges.
  - Chemical resistant clothing, such as Tyvek suit. Suits will be one piece with booties, hood, and elastic wristbands.
  - High visibility safety vest (disposable)
  - Outer chemical-resistant gloves (i.e. nitrile or neoprene) and inner latex gloves
  - Steel toe work boots
  - Hard hat

- Level B will generally consist of the following:
  - Self-contained breathing apparatus (SCBA) in a pressure demand mode, or supplied air with escape SCBA.
  - Chemical resistant closing, such as Tyvek suit. Suits will be one piece with booties, hood, and elastic wristbands.
  - High visibility safety vest (disposable)
  - Outer chemical-resistant gloves (i.e. nitrile or neoprene) and inner latex gloves
  - Chemical resistant tape over PPE as needed (i.e. at glove/Tyvek location)
  - Steel toe work boots
  - Hard hat

6.0 HAZARD ANALYSIS

Many hazards are associated with environmental work on a site. The hazards listed below deal specifically with those hazards associated with the management of potentially contaminated soil, air, and groundwater, physical hazards, as well as environmental hazards.

6.1 Chemical Hazards

The primary contaminants of concern in the soil include semi-volatile organic compounds (SVOCs) including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene and metals including copper and lead, primarily within the fill which varies from 3 to 5 feet below ground surface. A summary of hazards associated with these chemicals is include on Table 1. The list has been developed based on planned activities and potential site conditions. The most likely routes of chemical exposure during site work includes skin absorption and inhalation of airborne dust particles. The information was used to develop the levels of personal protective equipment (PPE) to be used during the duration of the RI field work on-site.

6.2 Physical/General Hazards

Based on the proposed scope of work to be completed, the following potential physical hazards have been identified:

- Slip/Trip/Fall – Due to the timing of the project, some areas may have icy surfaces that will increase the possibility of accidental falls. Additionally, good housekeeping practices such as cleaning up garbage, and stored materials from the work area are essential to reduce the occurrence of trips and falls the trip hazards.

- Vehicle and machinery in motion hazards – A drill rig will be utilized for soil sample collection. To minimize potential hazards, the drilling subcontractor will be responsible for health and safety of its personnel, equipment and operations. Utilities must be called in via Dig Safely New York and/or site owner. Cones and flags will be set up around each work area, as necessary. Workers must be aware of pinch points when setting the rig and lowering mast/pull rods. PPE must be worn to prevent eye injury. All body parts, clothing and manual tools must be kept 3-5 feet from moving equipment when possible. Gloves and PPE must be worn when working with rods and cleaning equipment. Monitoring of the breathing zone will be completed as necessary to ensure vapors are below action levels. Each worker must have an awareness of muscle strain. All sampling liners must be opened in a motion away from body and hands. The rig cannot be moved with the mast in a raised position.

- Electrical – Heavy equipment (e.g., excavator, backhoe, drill rig) shall not be operated within 10 feet of high voltage lines. Working near wet areas should also be taken into consideration when working with electrical equipment; Surge protectors and ground fault protectors must be used in such conditions.

- Noise – Heavy machinery creates excessive and loud noise levels. Over exposure can result in hearing damage or loss. Proper hearing protection shall be worn during exposure to noise from heavy equipment.

- Underground utilities– The proper utility clearance will be obtained before conducting any digging or drilling operations.

- Excavation and soil sampling through use of heavy equipment – Excavations that are greater than 4 feet in depth require a protective system prior to entry into the excavation.

The Project Manager will be responsible for determining if the excavation requires safety shoring. Personnel will not be permitted to work under suspended or raised loads, and shall always wear highly visible clothing. Personal protective equipment (PPE), including steel-toed boots, safety glasses, hard hats must be worn; personnel should not walk directly in back of, or to the side of, heavy equipment without the operator's knowledge. Engineering controls can be implemented such as water for particulate control.

- Cold Stress – Site work is scheduled during the early spring to summer months; therefore cold weather are not anticipated. Frostbite and hypothermia can occur quickly and the signs and symptoms of such should be known. Signs of hypothermia include slurred speech, confusion, and an overall warm sensation. Frostbite can be identified by red/frozen skin, numbness, and lack of sensation on the skin. In each case, the victim should be moved to a warm place. With frostbite, the affected area should be placed in warm water and wrapped with a warm towel. Medical attention is necessary after initial treatment.

- Heat stress - Site work is scheduled during the early spring to early summer months; therefore extreme hot weather is not anticipated. Heat stress is a severe hazard that can result in heat fatigue or even heat stroke. Signs and symptoms of heat stroke include red, dry, and hot skin as well as confusion, a rapid pulse, and nausea. Adequate shade and drinking liquids should be provided to personnel working in hot weather conditions. If a person is suspected to be suffering from heat fatigue or stroke, transport to a cool place and place cold compresses on the neck and armpits; call 911 immediately.

- Weather (i.e. lightning storm) – On-site personnel shall cease operation at the first sign of a thunderstorm/lightning strike. Workers should seek shelter within a permanent building and stay away from tall structures trees, telephone poles, and drill rigs/equipment.

6.3 Biological Hazards

Biological hazards can be caused by contact with land animals, birds, insects, and plants. Irritation, illness, and, in extreme cases, permanent disability or death can occur. The site is located in an urban area within the City of Buffalo and field work will occur in spring/early summer. Rodents are considered the most likely biological hazards at this site. Contact with rodents, more specifically rats, shall be avoided. If bitten or scratched by any type of rodent or fur-bearing animal, medical treatment should be sought immediately. Insect bites and stings are not considered a serious threat due to time of year. Insect bites and stings can cause irritation and transmit disease. If stung by an insect, apply cold water and soap and immediately apply a cold compress to the area to limit swelling. If the victim is allergic to such bite or sting, immediate medical care may be necessary.

7.0 SITE MONITORING

Air monitoring will be performed on-site in order to track contamination levels. By knowing these levels, safety is insured for personnel working on-site. A Photoionization Detector (PID) equipped with a 10.6 eV lamp will be utilized during field monitoring.

7.1 Soil Borings, Test Pits and Monitoring Wells

On-site monitoring will be completed by the SSO or site worker assigned to oversee drilling operations, soil sampling and monitoring well installation/sampling. The PID will be utilized to monitor the breathing zone, the borehole, and subsurface samples for the presence of volatile organic compounds (VOCs). Auger spoils will also be monitored. Fluids produced from monitoring well development and sampling will also be monitored with the PID.

7.2 Action Levels

Work area ambient air monitoring for VOCs will be completed within the breathing zone periodically. Action levels will be based on the PID readings. The action level assumes that background level of organics is close to non-detect. Background VOC readings will be recorded daily. Action levels are listed below.

Sustained PID Reading	Action	Minimum Respiratory Protection
0 to 10 ppm	None	None – Level D
10 to 25 ppm	Monitor for 15 minutes; if concentration does not decrease to under 10 ppm, upgrade PPE; consider venting area	Full-face Air-purifying respirator with organic vapor cartridges – Level C
>25 ppm	Monitor for 15 minutes; Consider venting area, upgrade PPE	Suspend work or supplied-air full face respirator – Level B

7.3 Particulate Monitoring

Monitoring for particulates will be completed periodically in the site worker breathing zone. The decision to upgrade levels of PPE will be made in conjunction with consideration for weather conditions, wind conditions and anticipated duration of field activity. Background particulate concentrations will be measured and recorded on a daily basis.

8.0 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Program (CAMP) requires monitoring of VOCs and particulates at downwind locations and is intended to provide a level of protection for neighboring residences and businesses. Continuous monitoring will during ground intrusive activities. The completed CAMP is attached in Attachment A.

9.0 SITE ACTIVITY AREAS AND ACCESS CONTROL

Prior to the initiation of the RI/IRM, three work zones will be established to facilitate the implementation of the HASP. Prior to commencement of field work, a further definition of where these zones will be set up will be established. Guidelines for establishing work areas follows.

- Exclusion Zone (EZ) – Primary exclusion zones will be established around each intrusive field activity, such as soil boring or excavation area. Locations will be identified by the placement of orange cones. Site workers in these areas must wear appropriate PPE. Upon leaving Work Zone, if PPE becomes contaminated, site workers must remove and dispose of gloves and any other disposable PPE. After removing the PPE, site workers should thoroughly wash their hands. Access to the EZ will be limited to site workers only for both safety and data integrity purposes.

- Contamination Reduction Zone (CRZ) – A CRZ will be established between the EX and property limit, and provides an area for decontamination of site equipment. The specific location of this pad will be field determined, but will be out of the way of site activities and sampling activities. Portable wash stations will be set up in the CRZ and will consist of a potable water supply, hand soap and disposable towels. An Alconox solution will be available to decontaminate equipment used in the sampling locations. The SSO will monitor equipment cleaning procedures to ensure their effectiveness. Equipment will be adequately cleaned and site workers will remove contaminated PPE prior to either entering the Support Zone or leaving the site for the day once sampling activities have been completed. A fire extinguisher and first aid kit will be located in this area.

- Support Zone (SZ) – The SZ is considered to be clean, and PPE are not required. The SZ will be an area on-site adjacent to the CRZ in which supplies or equipment are stored and maintained. PPE is donned in the SZ prior to entering the CRZ.

10.0 DECONTAMINATION PROCEDURES

Decontamination procedures for personal and equipment will be implemented when exiting work area. Decontamination involves physically removing contaminants and general include removal of contamination, avoiding spreading contamination from the work zone, and avoiding exposure of unprotected personnel outside the work zone to contaminants.

10.1 Prevention of Contamination

The first step in decontamination is to establish standard operating procedures that minimize contact with hazardous substances, and thereby the potential for contamination. Site workers should be aware of the importance of minimizing contact with hazardous substances and the use of appropriate practices and procedures for site operations. WGS utilizes this approach by ensuring site workers:

- Stress work practices that minimize contact with hazardous substances (e.g., do not walk through areas of obvious contamination, do not directly touch potentially

hazardous substances, etc.);

- Protect sampling instruments from gross contamination by bagging; make openings in the bag for sample ports and sensors that contact site materials;

- Wear disposable outer garments and use disposable equipment where appropriate.

10.2 Personal Decontamination

The degree of contamination exposure is a function of both a particular task and the physical environment in which it takes place. The following decontamination procedures will remain flexible, thereby allowing the decontamination crew to respond appropriately to changing conditions at the site. It is expected that site workers will be exposed to soil/fill potentially contaminated with SVOCs, metals, PCBs, and petroleum compounds. On-site sampling activities will be carried out in such a manner as to avoid gross contamination of site workers, personal protective equipment, machinery and equipment.

Between sampling locations (or sometimes between samples at one sampling location), and upon the completion of the daily field activities, site workers will proceed to the CRZ. Equipment (e.g., sampling tubes, shovels, tools, etc.) will be decontaminated in this area. Prior to leaving the site for breaks, at the end of the work shift, or when PPE has been grossly contaminated, disposable boot covers, gloves, and suits will be removed and placed in a drum designated for the disposal of these materials. After removing PPE, each site worker will wash with soap and fresh water prior to donning new PPE or leaving the site for the day. All wash water and rinse water will be collected and disposed of in accordance with appropriate regulations.

10.3 Decontamination during Medical Emergencies

In the event of a minor, non-life-threatening injury or medical problem, site workers should follow the decontamination procedures as defined above and then administer first aid. If prompt, live-saving first aid is required, decontamination procedures should be omitted and immediate first aid should be administered, unless the environmental conditions are considered immediately dangerous to Life or Health (IDLH). In this case, the victim should be moved to a clean area and life-saving care should be instituted immediately without considering decontamination.

Outside garments can be removed (depending on the weather) if they do not cause delays, interfere with treatment or aggravate the problem. Respirators and backpacks must always be removed. Chemical-resistant clothing can be cut away. If the outer contaminated garments cannot be safely removed, the individual should be wrapped in plastic, rubber or blankets to help prevent contaminating the insides of ambulances and medical personnel. Outside garments will then be removed at the medical facility. No attempt should be made to wash or rinse the victim at the site. One exception would be if it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life.

10.4 Decontamination of Equipment

Decontamination efforts will be conducted in the CRZ. Gross contamination will first

be removed with plastic scrapers or other appropriate tools. The equipment will be decontaminated at a temporary equipment decontamination pad in the CRZ via hand washing or pressure washing, as needed. Alconox and water will then be used to wash the equipment with a cleaning brush. The equipment will then be rinsed with deionized water. The equipment will then be allowed to air dry for a sufficient time prior to reuse or removal from the site. Downhole tools and augers can be hand washed or pressure washed.

The decontamination of the direct push drilling rig will be undertaken (if necessary) when all on-site activities have been completed. Initially, scraping of the equipment will remove heavily caked materials prior to washing. Washing will then be accomplished Alconox and water or pressure washing. Water generated during decontamination activities will be collected, stored and profiled for future off-site disposal.

10.5 Disposal of the Contaminated Materials

Potentially contaminated materials (gloves, clothing, sample sleeves etc.) will be bagged and segregated for proper disposal. Investigation derived waste will be managed in accordance with NYSDEC guidance regulations. For this project, it is expected that soils will be disposed as part of the IRM. All fluids collected during groundwater sampling will be containerized and managed appropriately subsequent to field activities.

11.0 EMERGENCY RESPONSE

In the event of an emergency, the SSO will coordinate on-site emergency response activities. Appropriate authorities will be immediately notified of the nature and extent of the emergency. Emergency contact list is included on Table 2. The route and directions to the hospital are included as Figure 2.

11.1 Response Procedures

In the event of an emergency or acute exposure symptom, remediation workers will signal distress to the SSO. The SSO will be responsible for the response to emergencies and must:

- Have available a summary of the associated risk potential of the project so that it can be provided to any authorities or response personnel in the event of an emergency;
- Maintain an Emergency Contact List (Table 2) and post in a visible location a map detailing directions to the nearest hospital (Figure 2); and
- Ensure appropriate safety equipment is available at the site.

11.2 Communications

Cell phones will be the primary means of communicating with emergency support services/facilities.

11.3 Evacuation

In the event of an emergency situation, such as fire, explosion, etc., all personnel will evacuate and assemble in a designated assembly area. The SSO will contact outside services (i.e. police, fire, etc.) as required. Under no circumstances will personnel be allowed to re-enter the area once the emergency signal has been given. The SSO must see that emergency equipment is available and emergency personnel notified.

11.4 Fire or Explosion

Immediately evaluate the site. The Buffalo Fire Department will then be notified immediately, and advised of the situation and the identification of any hazardous materials involved.

11.5 Personal Injury

Only basic emergency first aid will be applied on-site as deemed necessary. The SSO will supply available chemical specific information to appropriate medical personnel, as requested. First Aid kits supplied by HEI/WGS and its subcontractors will conform to Red Cross and other applicable good health standards, and will consist of a weatherproof container with individually sealed packages for each type of item. First Aid kits will be fully equipped before being sent to the site.

11.6 Adverse Weather Conditions

In the event of adverse weather conditions, the SSO will determine if work can continue without sacrificing the safety of remediation workers. Some of the items to be considered prior to determining if work should continue are the potential for heat stress, inclement weather-related working conditions (heavy snow) and the operation of field instruments.

11.7 Traffic, Heavy Equipment & Machinery

Site workers must remain aware of the heavy equipment and machinery being used during RI/IRM activities. Site workers will be required to wear a high visibility safety vest during on-site work activities.

11.8 Utilities

Prior to the beginning site activities, all available drawings of the facility will be examined to determine the presence of underground or sub-slab utilities. HEI anticipates that a magnetic pipe and cable locator will be effective in the prevention of encountering underground utilities.

11.9 Emergency Contingency Plan

In the case of a spill emergency (e.g., tank/drum release, spill, fire, etc.), this section will describe the procedures to be followed during the event.

11.9.1 Contamination Emergency

It is unlikely that a contamination emergency will occur; however, if such an emergency does occur, the specific work area shall be shut down and immediately secured. The area in which the contamination occurred shall not be entered until the arrival of trained personnel who are properly equipped with the appropriate PPE and monitoring instrumentation.

11.9.2 Spill/Air Release

In the event of a spill or air release of hazardous materials on-site, the specific area of the spill or release shall be shut down and immediately secured. The area in which the spill or release occurred shall not be entered until the cause can be determined and site

safety can be evaluated. The NYSDEC Spill Response unit shall be notified immediately. The spilled material shall be immediately contained.

11.9.3 Unknown Drums or USTs

In the event that unidentified containerized substances, including USTs, are discovered during soil sampling or soil excavation, work will be ceased immediately until hazards are addressed. The SSO will then visually assess the situation and identify any leaks or releases from the container. If leaking is identified, the spilled material shall be immediately contained. Upon visual assessment of releases and safety, properly trained personnel will then sample and remove/dispose of the waste/container.

11.10 Additional Safety Practices

The following are important safety precautions and practices that will be enforced during the field activities.

- Eating, drinking, smoking, chewing gum or tobacco or any activity that increases the probability of hand-to mouth transfer and ingestion of hazardous substances is prohibited during the RI/IRM activities.
- Remediation worker hands and face must be thoroughly washed before leaving the CRZ or before eating, drinking or other activity.
- Contact with potentially contaminated surfaces should be avoided whenever possible.
- The number of remediation workers and the amount of equipment should be minimized.
- Alcoholic beverages will not be consumed during work hours by site personnel; Personnel using prescription drugs may be limited in performing specific task (i.e. operating heavy equipment) without written authorization from physician.

12.0 RECORDS AND REPORTING

The SSO will be responsible for establishing and maintaining adequate records of activities which take place at the site. The records will pertain to site workers involved in the project, regardless of their employer, as well as any agency personnel. A basic list of the information to be maintained is as follows:

- Occupational injuries or illnesses.
- Accident investigations.
- Reports to insurance carrier or State Compensation agencies.
- Records and reports required by local, state and federal agencies.
- Property or equipment damage.
- Third party injury or damage claims.
- Environmental testing logs.
- Explosive and hazardous substances inventories and records.
- Records of inspections and citations.
- Related correspondence.
- Safety training level.

Tables

Table 1
Hazard Characteristics of Potential Contaminants of Concern

Contaminant	Potentially Impacted Media	Carcinogenicity/Symptoms of Acute Exposure	Occupational Exposure Values* ACGIH TLV OSHA PEL NIOSH IDLH
Benzene	Soil, Groundwater	Confirmed human carcinogen. Symptoms include irritation to eyes, skin, nose, respiratory system; headache; nausea; giddiness, fatigue.	PEL - 10 ppm; IDLH - 500 ppm; TLV - 0.5 ppm; STEL - 2.5 ppm
Chlorinated Organic Compounds	Soil, Groundwater	Exposure to the vapors of many chlorinated organic compounds such as vinyl chloride, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene and 1,2-dichloroethylene and other chlorinated hydrocarbons may result in various symptoms including irritation of the eyes, nose and throat, drowsiness, dizziness, headache, blurred vision, uncoordination, mental confusion, flushed skin, tremors, nausea, vomiting, fatigue and cardiac arrhythmia. The liquid if splashed in the eyes, may cause burning irritation and damage. Repeated or prolonged skin contact with the liquid may cause dermatitis. Some of these compounds are considered to be potential human car-cinogens.	Refer to 29 CFR 1910.1017 for exposure values
Toluene	Soil, Groundwater	Insufficient data from carcinogenic studies to classify substance as a potential carcinogen. Symptoms include irritation to eyes, nose; fatigue; weakness; euphoria; headache; lacrimation.	PEL - 10 ppm; IDLH - 500 ppm; TLV - 20 ppm; STEL - 150 ppm
Ethyl Benzene	Soil, Groundwater	Confirmed animal carcinogen with unknown relevance to humans. Symptoms include irritation to eyes, skin, mucous membranes; headache; narcosis.	PEL - 5 ppm; IDLH - 800 ppm; TLV - 20 ppm; STEL - 30 ppm
o-, m-, and p-Xylenes	Soil, Groundwater	Insufficient data from carcinogenic studies to classify substance as a potential carcinogen. Symptoms include irritation to eyes, nose, throat; dizziness; excitement; drowsiness; nausea; vomiting.	PEL - 100 ppm; IDLH - 900 ppm; TLV - 100 ppm; STEL - 150 ppm
Polynuclear Aromatic Hydrocarbons (PAH's)	Soil, Groundwater	Many PAH's found in fuel oil and coal tar pitch volatiles (creosote) are confirmed human carcinogens. Symptoms include dermatitis and bronchitis.	Some PAH's have no established exposure values. Others considered coal tar pitch volatiles have an ACGIH TLV and OSHA PEL value of 0.2 mg/m^3.
Cadmium	Soil	Suspected human carcinogen. Symptoms include pulmonary edema; difficulty breathing; cough; tightness in chest; substernal pain; headache; chills; nausea; vomiting; diarrhea; asnosmia.	PEL - 0.2 mg/m3; IDLH - 50 mg/m3; TLV - 0.01 mg/m3 (these limits are expressed for Cd dust)
Chromium	Soil	Hexavalent chromium compounds are confirmed human carcinogens. Symptoms include irritation to the respiratory system; nasal septum perforation; sensitization dermatitis (hexavalents). Irritation to the eyes; sensitization dermatitis (trivalents).	PEL - 0.5 mg/m3; IDLH - 250 mg/m3; TLV - mg/m3 (insoluable)
Lead	Soil	Confirmed animal carcinogen with unknown relevance to humans. Symptoms include weakness; tremor; irritation to eye; constipation; abdominal pain.	PEL - 0.05 mg/m3; IDLH - 100 mg/m3; TLV - 0.5 mg/m3
Mercury	Soil	Insufficient data from carcinogenic studies to classify substance as a potential carcinogen. Symptoms include irritation to eyes, skin; cough; chest pain; difficulty breathing; irritability; indecision; headache; fatigue; weakness; salivation.	PEL - 0.025 mg/m3 (acceptable ceiling concentration); IDLH - 2 mg/m3; TLV - 0.025 mg/m3 (elemental/inorganic)
Polychlorinated Biphenyl (PCBs)	Soil	Confirmed human carcinogen. Symptoms include dermal and ocular lesions, irregular menstrual cycles and a lowered immune response. Other symptoms included fatigue, headache, cough, and unusual skin sores	PEL - 1 mg/m3; IDLH - 5 mg/m3; TLV - 1 mg/m3

ACGIH TLV – American Conference of Governmental Industrial Hygienists Threshold Limit Value; Concentrations in ppm of mg/m3 based on an 8-hour TWA

OSHA PEL – Occupational Safety and Health Admiration Permissible Exposure Limits; Concentrations are shown in parts per million (ppm) or milligrams per cubic meter (mg/m3) based on an 8-hour time weighted average (TWA)

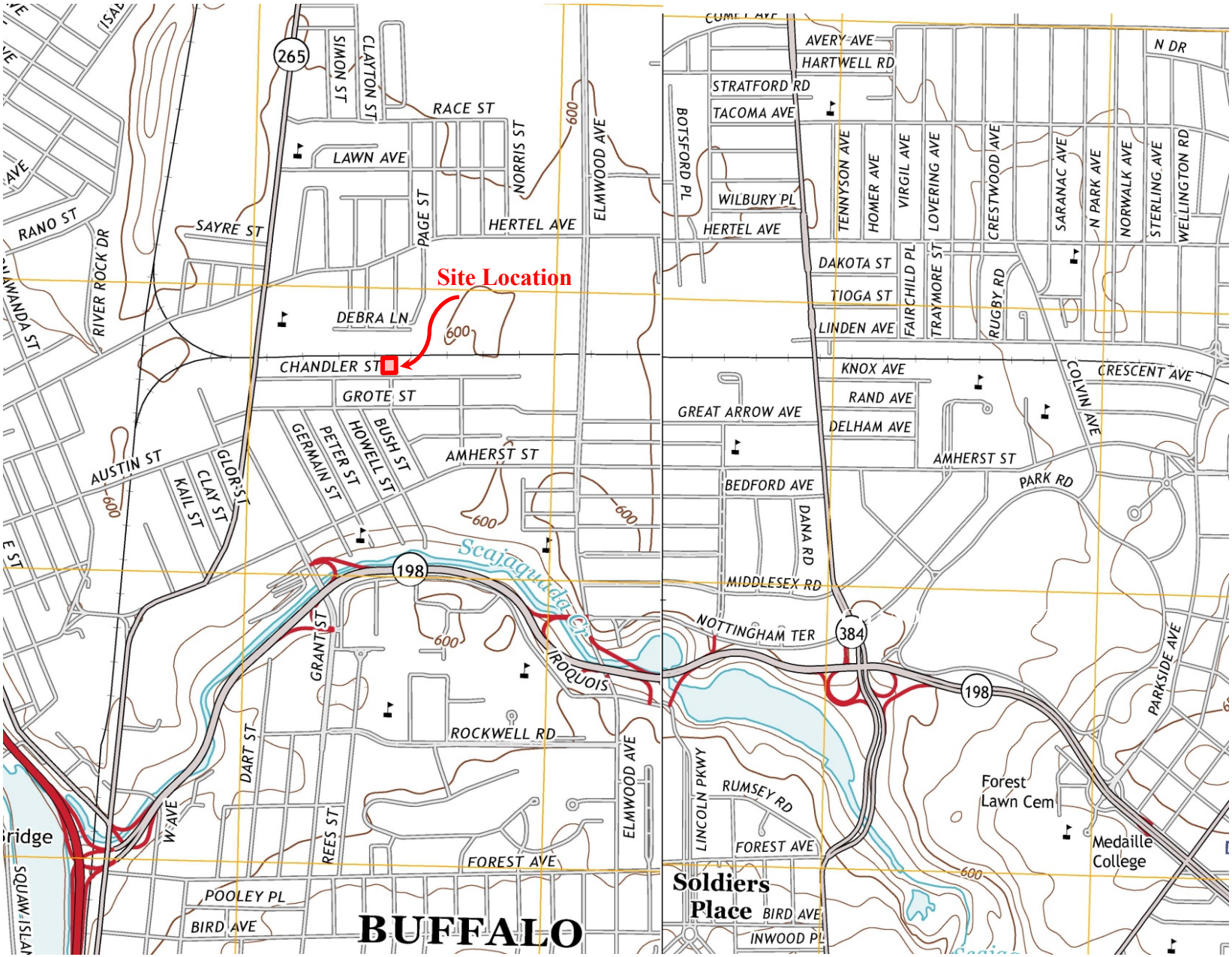
NIOSH IDLH – National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health; Concentrations in ppm or mg/m3

OSHA STEL - Short Term Exposure Limit

Table 2
Emergency Contacts

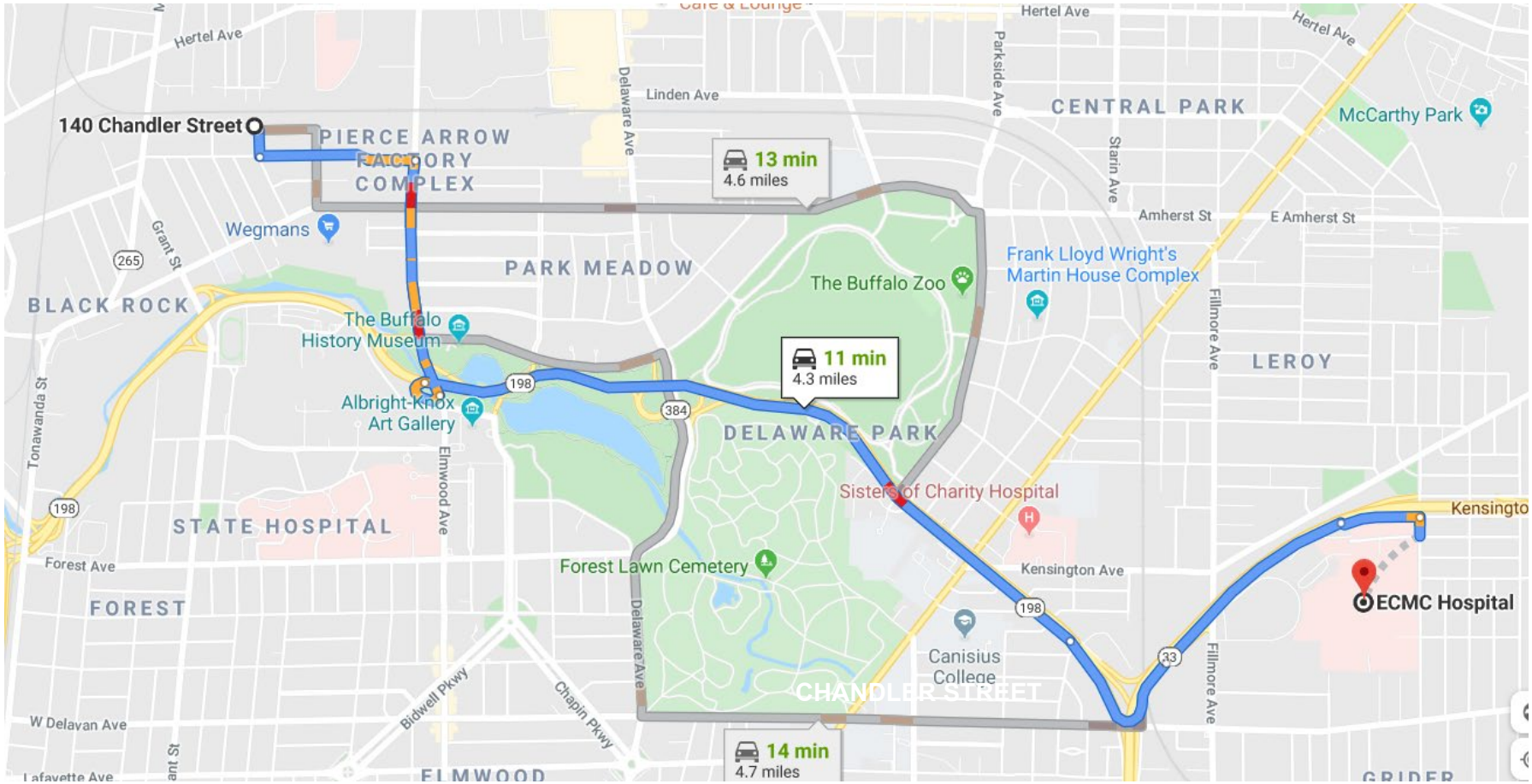
Agency	Contact	Phone Number
Buffalo Police	Emergency	911
Buffalo Fire/First Aid	Emergency	911
Ambulance	Emergency	911
Poison Control Center	Emergency	911
Hospital	Erie County Medical Center 462 Grider Street Buffalo, NY 14215	(716) 898-3000
NYSDOH	Krista Anders Empire State Plaza, Corning Tower Room 1787 Albany, NY 12237	(866) 881-2809
NYSDEC	Jaspal Walia 270 Michigan Ave. Buffalo, NY 14203	(716) 851-7220
NYSDEC	SPILL Hotline	(800) 457-7362
Wittman GeoSciences, PLLC	Michele Wittman, PG 3636 N. Buffalo Rd. Orchard Park, NY 14127	Cell: (716) 574-1513
Hazard Evaluations	Mark Hanna, CHMM 3636 N. Buffalo Rd. Orchard Park, NY 14127	Office: (716) 667-3130
Schenne & Associates	John Schenne,PE 391 Washington St. Suite 800, Buffalo, NY 14203	(716) 655-4991
140 Chandler Street, LLC (Owner)	Rocco Termini 391 Washington St. Buffalo, NY 14203	(716) 861-5385

Figures



THIS DRAWING IS FOR ILLUSTRATIVE AND INFORMATIONAL PURPOSES ONLY
AND WAS ADAPTED FROM USGS, BUFFALO NE & NW, NEW YORK 2013 QUADRANGLE.

WITTMAN GEOSCIENCES, PLLC	Date: 03/2020	**Site Location**	Project: 19211
	Scale: not to scale	C915354, 140 Chandler Street, Buffalo, NY	Figure: 1



Directions: Head south on Manton Street. Turn left onto Grout Street. Take Grout Street to the end and turn right onto Elmwood Avenue. Turn right to merge onto NY-198E. Use the right 2 lanes to take the NY-33 E exit toward Airport. Keep right, follow signs for Fillmore Ave. Turn left onto Fillmore Ave. Turn right at the 1st cross street onto Kensington Ave. ECMC entrance is located on the right.

WITTMAN GEOSCIENCES, PLLC	Date: 01/2020	**Directions to Hospital**	Project: 19211
	Scale: not to scale	C915354, 140 Chandler Street, Buffalo, NY	Figure: 2

WITTMAN GeoSciences, PLLC

Attachment A

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

BROWNFIELD CLEANUP PROGRAM
For
140 Chandler Street, LLC
Western Portion of 140 Chandler Street Site, 140 Chandler Street, Buffalo, New York 14207
BCP # C915354

Prepared For:
140 Chandler Street, LLC
391 Washington Street, Buffalo, New York 14203
WGS Project No: 19211

Prepared By:
Wittman GeoSciences, PLLC
3636 North Buffalo Road
Orchard Park, New York 14127
716-574-1513

January 9, 2020 rev March 30, 2020

WITTMAN
GeoSciences, PLLC

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1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been developed for the Remedial Investigation /Alternatives Analysis Report (RI/AAR) Work Plan to be completed by Wittman GeoSciences, PLLC (WGS) for Western Portion of 140 Chandler Street Site located at 140 Chandler Street, Buffalo, Erie County, New York, on behalf of 140 Chandler Street, LLC (Applicant) as part of the Brownfield Cleanup Program (BCP).

The CAMP requires real-time monitoring of volatile organic compounds (VOCs) and particulates (dust) at downwind perimeter of each designated work area. The CAMP will be implemented during the excavation and removal of soils from the courtyard and vacant lot areas of the subject site. This CAMP will be completed in general accordance with NYSDEC DER-10 Appendix 1A, as included in Attachment A. A figure showing proposed monitoring points is included as Figure 1.

2.0 VOLATILE ORGANIC COMPOUND AIR MONITORING

VOCs will be monitored at the downwind perimeter of the work are on a continuous basis and periodically during non-intrusive activities. VOC monitoring will be done using an organic vapor meter (OVM) equipped with a photoionization detector (PID) to provide real-time recordable air monitoring data.

VOCs will also be monitored and recorded at the downwind perimeter of the immediate work area(s). Upwind concentrations will be measured at the beginning of each day before activities begin and periodically throughout the day to establish background conditions. The downwind VOC monitoring device will also be checked periodically throughout the day to assess emissions and the need for corrective action. VOC monitoring action levels as per *DER-10 Technical Guidance for Site Investigations and Remediation* is as follows:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If the organic vapor level at the perimeter of the work area persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions take to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less; but in no case than that 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down.

3.0 PARTICULATE AIR MONITORING

The remediation crew will make all efforts to suppress dust and particulate matter during the handling of contaminated soil. Fugitive dust and particulate monitoring will be completed in accordance with DER-10 Appendix 1B, as included in Attachment B. The following techniques have been shown to be effective for the controlling the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and/or
(g) Reducing the excavation size and/or number of excavations.

Care will be taken not to use excess water, which can result in unacceptably wet site conditions. Use of atomizing sprays will prevent overly wet conditions, conserve water and provide an effective means of suppressing fugitive dust.

Weather conditions will be evaluated during remedial work. When extreme wind conditions make dust control ineffective, as a last resort, remedial actions may need to be suspended.

Dust and particulate monitoring will be conducted near approximate upwind and downwind perimeters of the work area, when possible. If visual evidence of dust is apparent in other locations, monitoring equipment will be placed where necessary. Dust monitoring may be suspended during period of precipitation and snow cover.

Particulate air monitoring will be done with a DataRAM-4 (or similar), which will be capable of reading particles less than 10 micrometers in size (PM-10) and equipped with an audible alarm feature which will indicate exceedances. Dust monitoring devices will be recorded periodically throughout the day to assess emissions and the need for corrective actions. Particulate monitoring action levels as per *DER-10 Technical Guidance for Site Investigations and Remediation* is as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu g/m^3$) 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. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 ($\mu g/m^3$) above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 ($\mu g/m^3$) above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

4.0 DOCUMENTATION

All 15-minute readings will be recorded and be available for or State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

5.0 WIND DIRECTION

Prevailing wind direction will be recorded at the beginning of each work day by visual observations of an on-site windsock. As wind direction may change throughout the work day, direction will be reestablished if a significant change in direction is observed. The wind direction results will be utilized to determine the placement of the monitoring equipment.

Figures

KEY

Down-wind site perimeter monitoring location

Up-wind site perimeter monitoring location

WITTMAN GEOSCIENCES, PLLC	Date: 03/2020	**Potential Air Monitoring Device Locations**	Project: 19211
	Scale: not to scale	C915354, 140 Chandler Street, Buffalo, NY	Figure: 1

Attachment A

NYSDEC DER-10 Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

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

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

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Attachment B

NYSDEC DER-10 Appendix 1B
Fugitive Dust and Particulate Monitoring

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Appendix 1C
DEC Permits Subject to Exemption

In accordance with section 1.10, exemptions from the following permit programs may be granted to the person responsible for conducting the remedial programs undertaken pursuant to section 1.2:

Air - Title 5 permits
Air - State permits
Air - Registrations
Ballast Discharge
Chemical Control
Coastal Erosion Hazard Areas
Construction of Hazardous Waste Management Facilities
Construction of Solid Waste Management Facilities
Dams
Excavation and Fill in Navigatable Waters (Article 15)
Flood Hazard Area Development
Freshwater Wetland
Hazardous Waste
Long Island Wells
Mined Land Reclamation
Navigation Law - Docks
Navigation Law - Floating Objects
Navigation Law - Marinas
Non-Industrial Waste Transport
Operation of Solid Waste Management Facilities
Operation of Hazardous Waste Management Facilities
State Pollution Discharge Elimination Systems (SPDES)
Stream Disturbance
Tidal Wetlands
Water Quality Certification
Water Supply
Wild, Scenic and Recreational Rivers