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REMEDIAL INVESTIGATION WORK PLAN

FORMER SPERRY REMINGTON SITE – NORTH PORTION
777 SOUTH MAIN STREET
CITY OF ELMIRA, CHEMUNG COUNTY, NY
NYSDEC SITE I.D C808022

Prepared for
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 8
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Certification

I Aron Krasnopoler certify that I am currently a NYS professional engineer as defined in 6 New York Codes, Rules and Regulations (NYCRR) Part 375 and that this Remedial Investigation Work Plan for the Former Sperry Remington Site – North Portion dated 29 May 2019 was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Aron Krasnopoler, P.E.

5/29/2019

1 INTRODUCTION

On behalf of Unisys Corporation (Unisys), Geosyntec Consultants, Inc. and its New York affiliate Beech and Bonaparte Engineering, P.C. (collectively Geosyntec) are submitting this Remedial Investigation (RI) Work Plan for the Former Sperry Remington Site – North Portion, Site #c808022 (Site) in accordance with the Brownfields Cleanup Program (BCP) Agreement for the Site. With the consent of the Elmira City School District (ECSD), on 26 April 2016 Unisys submitted an application to enter the Site into the New York State Department of Environmental Conservation (NYSDEC) BCP. NYSDEC gave an initial determination that the BCP application was complete on 10 June 2016 and received public comments on the application until 22 July 2016. The BCP Agreement for the Site was executed on 23 March 2017.

1.1 Background

The Site has been the subject of multiple environmental investigations between 1998 and 2017. In 2003, New York State Department of Health (NYSDOH) completed a Health Consultation for Southside High School (now Elmira High School [EHS]) (NYSDEC, 2003) that concluded that environmental conditions at EHS did not pose an apparent health hazard because average levels of compounds of potential concern (COPCs) in surface soils did not exceed public health comparison values. Although subsurface soil contained chemicals at levels exceeding public health comparison values, the school community was not being exposed to them. NYSDOH recommended at that time that ECSD develop a written soil management plan to "minimize potential public exposures to contaminated subsurface materials…"

An Order on Consent and Administrative Settlement (Order) between Unisys and the NYSDEC for the Site was approved by NYSDEC on 7 July 2014. Unisys conducted Site Characterization (SC) activities at the Site in accordance with the Order and the Site Characterization Work Plan (SC Work Plan) (Geosyntec, 2014a). A SC Data Report (Geosyntec, 2015a) was submitted to NYSDEC on 6 February 2015 that presented the activities, results and findings of the SC to date. Additional SC activities were conducted under SC Work Plan addenda dated 22 May 2015, 8 January 2016, 9 August 2016, 3 February 2017, and 16 March 2017 (Geosyntec, 2015b, 2016a, 2016b, 2017a, 2017b). Unisys submitted an SC Report (Geosyntec, 2017) in May 2017 that documents results of those activities conducted between 13 July 2015 and 13 April 2017 and provides references to previous reports in order to present a full summary of work. Future work at the Site, including the RI described in this work plan, is being conducted under the BCP Agreement. Additional information regarding previous investigations is provided in **Section 2**.

1.2 Purpose

An overarching purpose of the RI Work Plan is to describe the data collection methods to be used during the RI. All such methods will be consistent with NYSDEC Division of Environmental Remediation (DER)-10 Guidance. DER-10 provides an overview of site investigation and remediation processes for DEC's remedial programs administered by the DER. The objectives of the RI are four-fold. First, the RI will delineate the areal and vertical extent of COPCs in all media at or emanating from the Site. Second, the RI will determine the surface and subsurface

characteristics of the Site, including topography, geology and hydrogeology, including depth-to-groundwater. Third, the RI will identify the sources of COPCs, associated migration pathways, and actual or potential receptors of COPCs on or through the air, soil, bedrock, sediment, groundwater, surface water, utilities, and structures at the Site. And fourth, in accordance with DER-10 Guidance, the RI will evaluate available data as required for a fish and wildlife resource impact analysis.

1.3 Document Organization

The following sections comprise the remainder of this document:

- Section 2 – Site description and history;
- Section 3 – Objectives, scope and rationale;
- Section 4 – Field activities plan and Quality Assurance Project Plan (QAPP) protocols;
- Section 5 – Health and safety protocols;
- Section 6 – Citizen participation activities;
- Section 7 – Reporting;
- Section 8 – Schedule; and
- Section 9 – References.

2 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Site is located at 777 South Main Street in Elmira, New York, as illustrated on **Figure 1**. The Site is approximately thirty-four (34) acres and is bounded by South Main Street to the west, the Southern Tier Commerce Center (STCC) to the south, the Consolidated Rail Corp. property to the east and vacant land to the north. Miller Pond is located approximately one thousand (1,000) feet to the east. **Figure 2** is a Site map. Numbering of buildings that were part of the historical structure is from the Final Engineering Report and Description of Proposed Waste Treatment Installation (Lancy Laboratories, 1967); the buildings are listed on **Figure 2**. The Site is occupied by EHS. **Figure 3** illustrates the EHS building on Site.

2.2 Site History

From the late 1880s to the early 1970s, various industrial facilities have occupied the Site:

- 1887 – 1909: B. W. Payne & Sons, manufacturer of high speed steam engines;
- 1909 – 1935: Morrow Manufacturing, manufacturer of drill chucks, machine parts and tools;
- 1935 – 1937: Elmira Precision Tool Company, manufacturer of typewriter parts for Remington Rand;
- 1936 – 1972: Remington Rand, manufacturer of typewriters and adding machines;
- 1974 – 1977: Westinghouse Electric Corporation (Westinghouse) occupied the part of the Site south of the City of Elmira-Town of Southport township line, primarily for warehousing; and
- 1977 – Present: ECSD with construction of Southside High School (now EHS) in 1979.

Sperry Rand (successor to Remington Rand) conveyed the property to the Chemung County Industrial Development Agency on 28 December 1973. On 21 April 1977, Chemung County Industrial Development Agency conveyed the property to Westinghouse and that same day Westinghouse conveyed that property to ECSD.

In 1995, a fuel oil sheen was observed on Miller Pond east of the EHS property. Subsequent investigation by NYSDEC between 1995 through 1998 identified petroleum- related chemicals in groundwater approximately fifteen (15) feet below grade extending from the EHS property to Miller Pond. Former fuel oil tanks that had been located in the area of the current EHS gymnasium were considered a potential source. A remedial action (NYSDEC Spill #94-16668) was completed by NYSDEC between 2000 and 2011 with installation and operation of oxygen-injection systems to stimulate aerobic biodegradation of petroleum in subsurface soil and groundwater as follows:

- 2000 – 2001: forty-three (43) point oxygen-injection system (OIS) operated east of the EHS gymnasium;

- 2003 – 2006: twenty-four (24) point OIS operated in the southern portion of the EHS football field; and
- 2006 – 2011: seventeen (17) point OIS operated northeast of the EHS building.

NYSDEC conducted an environmental investigation of soil, groundwater, surface water and sediment at EHS in 2000 (NYSDEC, 2001). NYSDOH initiated a cancer study based on a concern of parents regarding a perceived unusual number of testicular cancers in past and present students at EHS at that time, which was brought to its attention by NYSDEC. NYSDOH evaluated all available information on cancer in students at EHS, collected indoor air samples from inside EHS and issued a Health Consultation Report in September 2003 (NYSDOH, 2003). The 2003 NYSDOH Health Consultation Report, which included findings from the Agency for Toxic Substances and Disease Registry (ATSDR), stated:

"Based on ATSDR's public health hazard category classification, the environmental conditions at Southside High School pose no apparent health hazard. This classification is used because average levels of contaminants in surface soils do not exceed public health comparison values. Although a few samples exceed health comparison values, people are unlikely to be exposed frequently to soil at these locations and the associated health risks are unlikely to be significant. Nevertheless, because average levels of total PCBs [polychlorinated biphenyls] exceed typical background levels and average levels of carcinogenic PAHs [polyaromatic hydrocarbons] are somewhat below the upper range of background levels, exposures to these contaminants at Southside High School may be greater than those typically experienced from soil. Students, faculty, staff and the community are not currently being exposed to subsurface soil, although it contains chemicals at levels exceeding public health comparison values."

In June 2009, ECSD prepared an Environmental Management Plan (EMP) in response to a 2003 request from the State Education Department (SED) to formalize environmental management operations and practices at EHS. NYSDEC and NYSDOH provided technical assistance to SED in development and review of the EMP. The intent of the EMP is to advise construction personnel and the general community regarding the potential for exposure to COPCs that may be present in soil, groundwater and soil vapor on EHS property. In February 2016, Unisys submitted a draft interim Site Management Plan (SMP) for agency review that included SC, response actions and updates to the EMP.

In March 2010, NYSDOH issued a Health Consultation Report (NYSDOH, 2010) that evaluated indoor and outdoor air quality as well as sub-slab vapor samples collected by ECSD in 2009. NYSDOH concluded that exposures to concentrations of volatile organic compounds (VOCs) in indoor air at EHS were not expected to be harmful to human health if the actions specified in the environmental management plan are implemented (i.e., operation of the heating, ventilation and air conditioning [HVAC] system in a positive-pressure mode). Given detections of Freon and chlorinated solvents in sub-slab vapor at various locations beneath the building, NYSDOH recommended continued operation of the building HVAC system for positive pressurization, continued routine monitoring of differential pressures between the sub-slab and building interior, additional evaluation of indoor air quality and pressure differentials in Room 127 of EHS, and

adjustments to the HVAC system in the area of Room 127 to reduce concentration of trichloroethene (TCE) in indoor air to within background. ECSD continues to monitor indoor air quality and pressure differentials.

Between 1972 and 1977, the former Remington Rand Plant was decommissioned and demolished. The administrative record contains little detail regarding decommissioning and demolition activities.

2.3 Previous Investigations

Through August 2018, approximately three thousand five hundred and fifty-one (3551) soil samples have been collected at approximately one thousand four hundred and ninety-four (1494) locations. In June 2013, NYSDEC identified potential areas of concern (AOCs) at the EHS property based on information related to historical use of the EHS property and previous environmental investigation results. Site AOCs are summarized in **Table 1**. The SC Work Plan dated July 2014 and revised October 2014 was submitted to NYSDEC and described data collection activities to document environmental conditions at the Site as it relates to AOCs and historical information. Unisys expedited implementation of the SC Work Plan, including collection of indoor air quality and surface soil samples, in order to complete most field activities and obtain preliminary results prior to start of classes at EHS on 3 September 2014. Verification of previous analytical results in surface (zero to two [0-2] inches below ground surface [bgs][1]) and shallow sub-surface (0.17 to two [2] feet bgs) soils were conducted in July 2014 in order to confirm that COPCs did not pose an unacceptable level of risk to human health and the environment prior to the start of classes. NYSDEC and NYSDOH provided oversight and review during field activities. Preliminary, non-validated analytical results for PCBs and semi-volatile organic compounds (SVOCs) in surface soils were submitted to NYSDEC and NYSDOH on 31 July 2014. Additional surface, shallow subsurface and subsurface (greater than two [2] feet bgs) soil investigations, groundwater investigation and former combined storm sewer inspections for SC were conducted at the Site between August and October 2014. The SC Data Report was submitted to NYSDEC on 6 February 2015 following data validation completion on 10 November 2014.

The SC Data Report identified PCBs, PAHs, and metals as COPCs at the Site based on comparison to Restricted Residential Soil Cleanup Objectives[2] (SCOs). A meeting to discuss analytical results for PCBs in soils was held on 17 March 2015 among ECSD, NYSDOH, NYSDEC and Unisys. NYSDOH and NYSDEC presented results of an evaluation that included PCB analytical data from samples collected from zero to two (0-2) feet bgs between 2000 and 2014 and vegetative cover conditions with respect to preventing potential exposures to shallow soils. According to NYSDOH, 2014 surface soil data were consistent with surface soil data previously collected by NYSDEC/NYSDOH and do not alter conclusions or recommendations presented in the 2003 Health Consultation prepared by NYSDOH. The 2003 Health Consultation also stated that well-established and maintained grass cover minimizes human exposures to soil by limiting direct

[1] Below ground surface is interpreted as below vegetative cover.
[2] 6 New York Codes, Rules and Regulations (NYCRR) Subpart 375

contact with the soil. As a precaution, a temporary short-term response action (STRA) was undertaken by Unisys to evaluate cover systems in areas where PCBs exceed 1 milligram per kilogram (mg/kg) in surface or shallow subsurface soils at the EHS and additional protective measures were implemented to prevent potential exposure to shallow soils in unpaved areas. The STRA activities began on 29 March 2015 and were completed on 3 April 2015 (Geosyntec, 2015c). A report on STRA activities was submitted to NYSDEC on 15 May 2015.

The SC Data report included recommendations for additional delineation of PCBs in soils from select areas of the Site. SC Work Plan Addendum #1 was submitted to NYSDEC on 22 May 2015 with responses to NYSDEC comments on 2 July 2015. Field activities for SC Work Plan Addendum #1 were conducted between 13 July and 7 August 2015. Subsurface soil borings were advanced to delineate the horizontal and vertical extent of PCBs in subsurface soils. A summary of field activities and analytical results for SC Work Plan Addendum #1 were presented in SC Work Plan Addendum #2, dated 8 January 2016, along with plans for additional delineation of PCBs in soils and evaluation of potential PCB migration in groundwater. Field activities for SC Work Plan Addendum #2 were conducted between 29 February and 24 March 2016. A summary of field activities and analytical results for SC Work Plan Addendum #2 were provided in SC Work Plan #3, dated 9 August 2016, along with plans for additional delineation of COPCs in soils and evaluation of potential PCB migration in groundwater. Other SC activities addressed 2 June 2015 comments from NYSDEC on the SC Data Report requesting evaluation of intermediate depth groundwater east of the gymnasium, characterization of VOCs in groundwater in the vicinity of the F-Wing (part of EHS Building) and catch basin inspection and sampling. Field activities for SC Work Plan Addendum #3 were conducted between 22 August and 28 September 2016. A summary of field activities and analytical results for SC Work Plan Addendum #3 were in SC Work Plan #4 dated 3 February 2017 along with plans for additional delineation of PCBs in soils. Field activities for SC Work Plan Addendum #4 were conducted between 6 and 16 February 2017. Review of non-validated data indicated the need for additional data collection to complete a design of the interim remedial measure (IRM) #1 that was conducted at the Site in summer 2017. Plans for additional delineation of PCBs in soils were submitted as SC Work Plan Addendum #5 on 16 March 2017. Field activities for SC Work Plan Addendum #5 were conducted between 20 and 24 March 2017 and with modifications between 10 and 13 April 2017 and 15 and 23 May 2017. A SC Report was submitted to NYSDEC on 17 May 2017 that described SC and remedial activities conducted to the date of the report.

IRM #1 was conducted between 19 June and 8 September 2017 for removal of PCB-impacted soils in the vicinity of the EHS Tennis Courts (North Excavation) and Main Parking Lot (South Excavation), in accordance with the IRM (#1) Work Plan, dated 11 July 2017, and approved by NYSDEC on 10 August 2017. IRM construction in the South Excavation was limited to excavation to four (4) feet below ground surface (ft bgs) in the main parking lot and to two (2) feet bgs in areas to the east due to the schedule for ECSD capital improvements in 2017. Unisys received notification of the ECSD capital improvements project in December 2016. Though not under any Order at the time the work was conducted, Unisys proceeded with the work so that it could be completed in concert with the capital improvements work. The balance of the South

Excavation will be completed in accordance with the IRM Work Plan at a later date. Amendment #1 to IRM #1 Work Plan, dated 11 August 2017, requested and received NYSDEC approval to modify the material staging area (MSA) constructed on STCC property for long-term management of excavated soils and clean fill. Soils approved by NYSDEC for reuse as backfill below two (2) ft bgs have been maintained in the MSA since September 2017. Amendment #1 also presented plans for surface soil removal in the southwest portion of the football field and high jump pit area for the purpose of minimizing potential exposure to PCBs in those areas. Activities associated with the football field and high jump pit area were completed in September 2017. IRM #1 activities are documented in a Construction Completion Report (CCR) submitted to NYSDEC on 30 April 2018 (Geosyntec, 2018a).

IRM #2 Pre-Design Investigation (PDI) field work was conducted between 5 and 24 January 2018 in the vicinity of the EHS Rear Parking Lot. Amendment #1 to IRM #2 PDI Work Plan was submitted on 23 February 2018 to address data gaps in PCB pre-delineation and waste characterization and was conditionally approved by NYSDEC on 26 February 2018. Amendment #1 field work was conducted between 26 February and 6 March 2018. Amendment #2 to IRM #2 PDI Work Plan was submitted on 19 April 2018 for additional PCB pre-delineation and waste characterization. Amendment #2 field work was conducted between 24 and 26 April 2018. IRM #2 PDI activities are documented in the Revised IRM #2 Work Plan submitted to NYSDEC on 13 July 2018 (Geosyntec, 2018b). IRM #2 was conducted between 22 June and 15 October 2018. IRM #2 activities are documented in a Construction Completion Report (CCR) to be submitted to NYSDEC.

Investigations completed prior to SC and IRM investigations at the EHS property include:

- Soils and Foundation Study, Southside Recreation and Education Facility, Elmira, New York, Empire Soils Investigations, Inc. 13 May 1977;

- Preliminary site assessment (PSA) regarding the Remington Rand Plant conducted in 1988 (Dames & Moore, 1988); the PSA report describes the results of a review of readily available information and visual reconnaissance of the property from public areas;

- Subsurface Environmental Assessment Report, 777 South Main Street to Parkside Drive, Matrix Environmental Technologies, 9 November 1998;

- May-October 2000 NYSDEC Sampling Report, Southside High School and Adjacent Properties, City of Elmira, Chemung County, NYSDEC, 30 September 2001;

- Health Consultation Report, Southside High School, City of Elmira, Chemung County, NYSDOH, 30 September 2003; and

- IIWA Report on Groundwater Chlorinated Solvent Investigation, Southside High School and Adjacent Properties, City of Elmira, Chemung County, NYSDEC, 1 March 2004.

2.4 Parallel Investigations

Investigations are ongoing at the Site in parallel with the work described in this RI Work Plan. These parallel investigations are as follows:

1. Soil investigation of the Football Field Complex (FFC) area for the RI and PDI as part of proposed IRM #3; and
2. Supplemental vapor intrusion (SVI) assessment.

Sampling conducted for these parallel investigations inform the design of this RI Work Plan. That is, sampling for the RI will not replicate data collected in a parallel investigation and the findings from all investigations are planned to be incorporated into a comprehensive RI Report. This allows for a consistent sampling approach for soils to be investigated during this RI and if necessary, the sampling approach would be consistent with supplemental PDI that have proceeded with regular subdivisions of the sampling grid (i.e., 30-foot step-outs).

The FFC RI and IRM #3 PDI included sampling for VOCs in soil and groundwater, in August and October 2018. In summary, analyses for VOCs in the FFC area included one hundred and twenty-seven (127) soil samples collected at seventy-two (72) locations and groundwater samples at seven (7) locations (**Appendix A**). TCE was detected above NYSDEC *Technical Operational Guidance Series (TOGS)* 1.1.1 (NYSDEC, 1998) groundwater standard of 5 micrograms per liter (µg/L) at temporary well B2544 (20 µg/L). Evaluation of TCE soil analytical results from the FFC indicates TCE was not detected above the Protection of Groundwater (PGW) SCO of 0.47 mg/kg in any of the sixty-two (62) soil samples collected from deeper intervals (i.e., below ten [10] feet bgs).

2.5 Conceptual Site Model

A conceptual site model (CSM) is used to develop a general understanding of the Site and to evaluate potential human exposure pathways and impacts to the environment. The objective of the CSM is to identify potential sources of COPCs, types of COPCs and affected media, release mechanisms and potential COPC pathways and potential human and environmental receptors.

2.5.1 Areas of Concern (AOCs)

"Area of concern" or, "AOC" means any existing or former location at a site where COPCs are known or suspected to have been discharged, which is considered a potential source area. These include locations where COPCs were generated, manufactured, refined, transported, stored, handled, treated, disposed or where they may have migrated. AOCs identified by NYSDEC are summarized in **Table 1**. The approximate location and extent of each AOC identified by NYSDEC is shown on **Figure 4**. The AOCs are a particular focus of the RI. Some small portions of AOCs lie on the adjoining STCC property to the south of the Site and will be addressed in the RI of the Former Sperry Remington Site (NYSDEC #808043) or the SC of the Former Scott Technologies Site (NYSDEC #808049). AOCs that extend to the east of the Site are addressed in this RI.

2.5.2 Other Areas

For the purposes of the BCP, comprehensive sampling across the Site involves sampling in areas of the Site that are not part of an AOC.

An area along the northeastern Site boundary (**Figure 2**) appears to have been formerly used for railroad loading and off-loading. This area is not part of an AOC.

2.5.3 Chemicals of Potential Concern (COPCs)

Site COPCs for soils, groundwater and soil vapor were defined by the SC (Geosyntec, 2017). Site COPCs for soils were identified by comparing analytical results to values consistent with Restricted Residential SCOs presented in 6 NYCRR Subpart 375. COPCs identified for soils include metals, polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs).

COPCs for groundwater were identified by comparing the most recent groundwater analytical data to NYSDEC *TOGS 1.1.1* (TOGS, NYSDEC, 1998). COPCs identified for groundwater include lead, PCBs, SVOCs and VOCs.

COPCs for soil vapor are identified as described in separately prepared documentation for the SVI assessment.

2.5.4 Land Use

The Site consists of parking lots, athletic fields, and academic buildings (**Figure 2**). Land use is commercial/manufacturing to the south and residential to the west and north. To the east, the Site is bounded by the Consolidated Rail Corp. property and residential and commercial properties beyond. **Figure 3** is a map of the EHS Building.

2.5.5 Topography and Drainage

The topography of the Site is relatively flat with a slight gradient to the east. The elevation of EHS is approximately eight hundred fifty-four (854) feet above mean sea level as depicted on the Elmira, New York 1976 U.S. Geological Service (USGS) 7.5-minute topographic quadrangle map (**Figure 1**). Natural surface drainage has been altered significantly by construction at the Site. Drainage is either to storm drains (a.k.a. catch basins) or it flows eastward toward the railroad tracks (Dames & Moore, 1988).

2.5.6 Geology and Hydrogeology

A stratigraphic layer comprised of reworked native soils and fill material is located on the Site at a depth of approximately zero (0) to six (6) feet bgs (thickness varies). That fill unit is composed primarily of medium- to- fine sand with silt and medium- to fine gravel, and, in places, includes some red brick, concrete fragments, and wood debris.

Two (2) naturally-occurring continuous stratigraphic units underlie the fill unit. The upper unit is post-glacial outwash. This unit consists of gray-brown fine sand and sub-rounded- to- rounded,

coarse- to- fine gravel. . Previous investigation including borings beneath and near the EHS building (Empire, 1977) document this unit extending below forty-two (42) feet below grade in the southwestern portion of the Site, indicating that the base of this unit varies in depth across the Site. The portion of the post-glacial outwash unit underlying the base of water-table monitoring wells (e.g., at approximately twenty-one (21) feet bgs at SSHS-MW11S) to the base of the unit has been described as the "intermediate" depth (**Appendix B**).

The second unit is a glacio-lacustrine silt and clay. The unit is relatively impermeable and consists of soft, gray-brown silt and clay, and extends from approximately thirty-eight (38) feet bgs to approximately seven-eight (78) feet bgs in undisturbed areas. The top of weathered bedrock underlies the glacio-lacustrine unit and overlays competent shale, which dips slightly to the north.

Previous investigations conducted for the Site indicate that the groundwater flow direction at the Site is to the east-northeast in the uppermost water-bearing zone, which is in the post-glacial outwash unit. Two (2) production wells that provide non-contact cooling water are located to the south of the EHS building. Based on data provided by ECSD, the pumping capacity of each well is approximately six hundred (600) gallons per minute (gpm).

2.5.7 Former Combined Industrial Sewer and Piping Infrastructure

The former combined industrial sewer and piping infrastructure conveyed industrial wastewater and storm water to a culvert on STCC property for discharge to Coldbrook Creek. The current EHS storm water sewer conveys storm water and non-contact cooling water discharge to the same culvert. The extent of those sewer systems including invert elevations previously collected for the sewer infrastructure are shown on **Figure 6**. Characterization of the extent of the former industrial sewer is incomplete as shown on **Figure 6;** further investigation is planned as described in **Section 3**. General findings from in-line camera surveys, fine-grained material sampling and analyses, and soil sampling and analyses as a part of EHS SC (Geosyntec, 2017) are summarized for the former industrial sewer in **Section 3.2.2.2**.

General findings for the current EHS storm sewer are as follows:

- The thirty (30)-inch sewer line in-between the school building and the athletic field was surveyed between CB-09 and CB-05. That sewer line was observed to contain dry fine-grained material, gravel, and rocks in the line section between one hundred ninety (190) feet and two hundred (200) feet from CB-09 toward CB-05. At CB-05, the invert from CB-09 appeared higher than the invert to CB-04 suggesting that stormwater from the main parking lot area that is collected in CB-09 is conveyed through CB-05 toward CB-06 and eventually south of the Site to STCC property.
- Upstream connections to CB-09 were surveyed from CB-13, CB-18, CB-19 and CB-20. Those connections collect storm water from the football field, the main parking lot and the main entrance. Sewer lines were observed to be intact and drains were generally observed to be dry. Fine-grained material and mud were observed in the sewer line between CB-18 and CB-17 at a distance from CB-18 of approximately sixty-three (63) feet. Two (2) four

(4)-inch taps were observed at a distance of approximately seventy (70) and seventy-five (75) feet from CB-18. Review of historical school construction plans suggests that those taps are roof drain connections.

- A thirty-three-inch (33-inch) sewer line east of the gymnasium was surveyed from CB-04 to CB-06. That line was dry and intact. The combined industrial sewer line south of CB-06 was surveyed prior to the SC (Geosyntec, 2013). The K-Wing foundation pile breaches the west side of storm sewer pipe south of CB-04, but is not believed to significantly restrict flow through the pipe. Storm water flow is assumed to be to the south toward STCC. This section of the combined industrial sewer line was observed to be intact and is part of the current EHS storm sewer system.
- A twelve (12)-inch sewer line at the south end of the rear parking lot was inspected from CB-07 until the line joined the forty-eight (48)-inch line south of CB-06. That line was dry and intact. The forty-eight (48)-inch line south of CB-06 was surveyed previously (Geosyntec, 2013) and was observed to be free of fine-grained material and debris. The forty-eight (48)-inch line connects to an eight (8) to twelve (12)-foot diameter covered concrete culvert on the STCC property that discharges to the adjacent wetlands to the east.
- A twenty-four (24)-inch sewer line south of the EHS building was surveyed from CB-06 to CB-23 including the branch line to CB-21. Storm water flow is assumed to be toward CB-06. The branch line from CB-21 was observed to be dry and intact. The survey from CB-06 toward CB-22 was terminated at a distance of approximately one hundred sixty-six (166) feet due to obstructions in the line and cascading flow. That flow is assumed to be coming from the chiller. Due to the obstruction, a reverse survey was completed from CB-22 for a distance of approximately one hundred thirty-five (135) feet. Rocks observed in the line appear to be the source of obstruction and the cascading overflow of presumably chiller water. The line from CB-06 to CB-22 was observed to be intact.

A twelve (12)-inch diameter sanitary sewer line, extending east-west and located north of the football field, was camera-surveyed as part of the SC and found to contain fine-grained material as reported in the Draft SC Report (Geosyntec, 2017). This sewer is being further characterized as part of the PDI for IRM #3.

2.5.8 Nature and Extent of COPCs

2.5.8.1 Soil

The SC Report (Geosyntec, 2017) includes a detailed description of the nature and extent of PCBs, metals, SVOCs and VOCs, by depth and location, across the Site. For some areas, further COPC delineation is warranted in the RI based primarily on exceedance of Restricted Residential SCOs in surface (zero [0] to two [2] inches bgs) and shallow subsurface (two [2] inches to two [2] ft bgs) soils. In subsurface samples collected below two (2) ft bgs, laboratory analytical results for total PCBs are compared to a subsurface screening value of 10 mg/kg for delineation. Concentrations of other COPCs are compared to the Restricted Residential SCOs for reference. In addition to soil data, SC data indicated the water table lies at approximately fourteen (14) to sixteen (16) feet

below grade. Total PCB results for soil samples collected near the water table depth are compared to the PGW SCO for total PCBs of 3.2 mg/kg. Total PCB concentrations in samples collected at all depths are also compared to the limit of 50 mg/kg for PCB remediation wastes as defined in 40 CFR §761.3 Toxic Substances Control Act (TSCA). TSCA limits are considered in PCB delineation for identification of those soils that may be classified as hazardous waste containing PCBs as defined in 6 NYCRR Part 371.4 (e).

2.5.8.2 Groundwater

The SC report (Geosyntec, 2017) includes a description of the Site hydrogeology, which is summarized above, and also characterizes the magnitude and extent of COPCs in groundwater based on the pre-existing monitoring well network and limited, new AOC-based groundwater evaluations. The SC identified discrete areas where groundwater samples have exceeded TOGS; these areas are discussed by COPC as follows; groundwater monitoring well locations are illustrated on **Figure 2**.

PCBs concentrations exceeded TOGS at the following sampling locations:

SSHS-MW15S;

SSHS-MW34;

SSHS-MW41;

SSHS-B99; and

SSHS-B510.

SVOCs concentrations exceeded TOGS at the following sampling locations:

SSHS-MW12;

SSHS-B99;

SSHS-B26-A; and

SSHS-B575B and C.

Concentrations of tetrachloroethylene, TCE, cis-1,2-dichloroethylene, Freon 113, or Freon-12 exceeded TOGS at the following sampling locations:

SSHS-MW30;

SSHS-B510;

SSHS-MW8S;

SSHS-MW9;

SSHS-B29-A;

SSHS-SB1;

SSHS-MW12;

SSHS-B94; and

SSHS-B92.

Acetone was detected in 2008 at a concentration exceeding TOGS at SSHS-MW41.

The SC data characterize TOGS exceedances but do not provide delineation of some affected areas. Further characterization of some areas is warranted and will be conducted in the RI as described in **Section 3**.

2.5.8.3 Soil Vapor Intrusion

Soil vapor intrusion is being addressed under a parallel investigation, the SVI assessment. The nature and extent of COPCs as related to vapor intrusion are described in the documentation for the SVI assessment (Geosyntec, 2018d).

3 OBJECTIVES, SCOPE, AND RATIONALE

3.1 Objectives

The objectives of this RI are as follows:

1. Collect analytical data to characterize AOCs and other areas not formally defined as AOCs for COPCs;
2. Collect analytical data to characterize the nature and extent of COPCs in environmental media at the Site;
3. Collect analytical data to characterize the nature and extent of COPCs emanating from the Site;
4. Supplement and verify existing information on the environmental setting and COPCs;
5. Collect data describing human populations and environmental systems that may be susceptible to exposure to COPCs at the Site;
6. Collect groundwater data to characterize the stability of COPCs in groundwater; and
7. Collect data to assess the fate of COPCs in the environmental setting and to assess their potential to naturally attenuate to safe levels.

3.2 Scope and Rationale

3.2.1 Site Records Assessment

The historical record regarding decommissioning and demolition of former industrial facilities and off-Site disposal related to industrial operations is of interest for the purposes of the RI. The 1988 PSA (Dames & Moore, 1988) references these activities and provides relevant information. The files related to the 1988 PSA and readily available information on file at Chemung County will be reviewed to provide additional information regarding these aspects of the Site history.

As described above, during the SC a twelve (12)-inch diameter sanitary sewer line, extending east-west and located north of the football field, was camera-surveyed and found to contain fine-grained material (Geosyntec, 2017). RI activities will address this sewer by, as a first step, providing a more complete characterization of the current use of the sewer and its discharge point. This will be accomplished by reviewing readily available records on file at EHS regarding the EHS active sanitary sewer system to assess if this sewer is part of the active system. Readily available City records will be obtained regarding off-Site connection of the sewer to the City system. Next steps in the assessment of the sewer will depend on findings of this assessment and will be provided in an interim report to NYSDEC as described in **Section 7**.

Historical aerial photographs and fire insurance maps will be used to evaluate the location of former structures related to the railroad siding area on the northeastern Site boundary.

Findings from reports prepared by others under the direction of NYSDEC regarding petroleum remediation and plume attenuation at the Site (Geosyntec, 2017) will be reviewed to inform the CSM regarding petroleum COPCs.

3.2.2 Soil Investigation

In the previous Site investigations, sampling characterized the presence of COPCs in fill and soil at concentrations above Restricted Residential SCOs. However, additional sampling is necessary to sufficiently characterize COPCs in soil at the Site for purposes of the BCP. In support of the RI objectives, the planned soil investigation is designed to complement existing data (e.g., from the SC and PDIs for IRM #1and IRM #2) and concurrent data collection (e.g., RI / PDI for IRM #3 and SVI assessment) to provide a complete environmental characterization of the Site and to support evaluation of potential health risks and identification of remedial goals and alternatives. Findings of the soil investigation will also be used to further characterize the nature and extent of petroleum COPCs related to the Site.

For the soil investigation, this will be accomplished by comprehensive Site-wide soil sampling. This will include investigation of AOCs and other areas not formally identified as AOCs to address data gaps indicated in the sample data (e.g., limited spatial coverage for COPCs in previous sampling). Soil COPC concentrations will be compared to SCOs listed in 6 NYCRR Part 375 Subpart 375-6 (including unrestricted use). Findings of the comparison to PGW SCOs will inform the CSM and groundwater investigation as described in **Section 3.2.3**. Results for soil or groundwater will lead to supplemental work, if indicated, following the decision process depicted on **Figure 5**.

Any soil investigation beneath the EHS building will be conducted in a phased approach. First, an assessment of the EHS building footprint will be made to identify potentially feasible areas for vertical soil borings, based on infrastructure including door widths, clear heights, subgrade utilities and crawl spaces, stairways and presence of a vapor barrier that underlies parts of the EHS building (i.e., the vapor barrier will be protected by avoiding penetrating it). An assessment of the building exterior and immediate surroundings also will be made to identify potentially feasible areas for directionally-drilled soil borings, based on the presence of subgrade utilities and above-ground infrastructure. A Site reconnaissance will be made with a drilling services contractor(s) and an EHS representative. Areas confirmed as being feasible for sampling will be referenced in a supplemental soil sampling program for sampling locations beneath the EHS building. Sampling locations will reflect the needs of the RI as described in the following sections. Finally, any readily available previous sampling data on file with EHS and the results of the SVI assessment will be incorporated into the EHS building assessment. The supplemental soil sampling program will follow the schedule identified in **Section 8**.

As requested, selected soil samples will be analyzed for 1,4-dioxane and PFAS (i.e., emerging COPCs, as they are described in NYSDEC guidance dated March 2019). Groundwater sampling for emerging COPCs will be conducted prior to soil sampling for emerging COPCs; sampling will be conducted in a manner consistent with the NYSDEC guidance (**Appendix C**). The soil sampling strategy is planned to include sampling for emerging COPCs at the TCE-impacted soil

area, under the CSM that the emerging COPCs and TCE impacts, if any, would likely be located in the same area. The sampling plan for emerging COPCs in soil is further described by the sampling plan for the TCE-impacted area in Section 3.2.2.2.

3.2.2.1 Delineation of COPCs in Soils

Figure 4 illustrates the boundary of the Site and AOCs. Other areas, not identified as AOCs, also are depicted on **Figure 4**. The location of and rationale for planned sampling locations are based on the CSM for each AOC, and for other areas, as described in **Section 3.2.2.2**. Sampling will be used to characterize each AOC as a potential source for COPCs to soil and include relevant information regarding depths/elevations of structures (e.g., depths of sewer inverts). Sampling results from other areas, that are not identified AOCs, also will be compared to SCOs. The investigation strategy is described on **Figure 5**, indicating the decisions and actions that will follow from specific results for each sample. Where sample results indicate that further delineation of COPCs is needed relative to SCOs, this will be accomplished through additional soil sampling. If such further delineation is needed, a supplemental sampling plan consisting of a map depicting results, target analytes, sampling locations and depths will be submitted to NYSDEC by electronic mail for review and approval. **Table 2** lists samples planned for collection for each location and the parameters planned for analysis for each sample. Subsequent sampling will follow as described on **Figure 5**.

Consistent with RI work associated with the FFC, soil borings will be drilled to the depth of the water table, which is at a depth of fourteen (14) to sixteen (16) feet bgs, depending on location. To evaluate the potential for COPCs in soil to have migrated to groundwater, soil sampling will extend vertically into the water bearing unit and will continue if visual or screening impacts are observed. Soil samples will be collected at depth intervals in turf areas as follows, deeper if groundwater is encountered:

zero (0, defined as base of vegetation layer) - two (2) inches (0.17 feet) bgs

two (2) inches (0.17 feet) – two (2) feet bgs

two (2) – four (4) feet bgs

four (4) – six (6) feet bgs

six (6) – eight (8) feet bgs

eight (8) – ten (10) feet bgs

ten (10) – twelve (12) feet bgs

twelve (12) – fourteen (14) feet bgs.

In non-turf areas (e.g., paved areas), soil samples will be collected at depth intervals, with the shallowest at the base of sub-base fill) – two (2) feet bgs, proceeding as described for turf areas from two (2) feet downward. **Table 2** indicates if the sample location lies in a turf or non-turf area.

Parameters to analyze, by sample, are generally as follows, with details provided in **Table 2**:

i. PCBs – all samples, except where previous data exist;

ii. Metals – all samples, except where previous data exist;

iii. VOCs – In turf areas, the two (2) inch - two (2) foot sample, in non-turf areas, the base of sub-base fill to two (2) foot sample, and the deepest sample (typically twelve [12] – fourteen [14] feet bgs), and at intervening depths depending on the field indications including photoionization detector (PID) screening results, olfactory and visual observations. The PID screening evaluation will include an evaluation of screening first at the two soil borings closest to Room 127 (**Figure 3**), using a correlation between a PID and Draeger tubes. Draeger tubes specific to TCE will be used. If a correlation between TCE detection and a positive PID reading is observed, the corresponding PID reading will be used as the screening criteria. If a correlation cannot be established, use of Draeger tubes will be continued for screening in select VOC-based AOCs. VOC samples will not be collected at intervening depths if there is no field indication (viz., PID, olfactory or visual indication) of the presence of VOCs for the interval and where previous data exist;

iv. SVOCs – top two samples depending on the field indications as listed for VOCs and except where previous data exist.

Soil samples will be collected using DPT or hand auger (where necessary) in accordance with the Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) (**Appendix D**) for the Site. For non-VOCs, soil sampling within the first two (2) feet of soil will be conducted by collection of a composite shallow soil sample from two (2) inches (0.17 feet) to two (2) feet bgs. Soil sampling in subsurface soils below two (2) feet bgs will be conducted by collection of a composite sample over each two-foot interval (2 ft) between two (2) and fourteen (14) feet bgs. A decontaminated stainless-steel bowl (for soil samples to be analyzed for SVOCs) or disposal plastic bags (for soil samples to be analyzed for PCBs and/or metals only) will be used to mix and homogenize soil to get a composite sample at the desired depth interval. For VOCs, samples will not be composited, and will be collected in accordance with the QAPP/FSP. Sampling intervals for each soil boring location are presented in **Table 2.** In the event that insufficient sample volume is available for all sample analytes in a particular sample interval, soil sampling will first proceed with limited soil sample volume available for that depth interval before moving to the total depth as proposed in **Table 2**. For depth interval(s) where sufficient sample volume could not be collected at the original borehole, additional samples for all proposed sample analytes will be obtained by stepping out two (2) feet and re-drilling/re-sampling to the desired depth interval(s). Should refusal again be obtained, at this point it will be deemed impracticable to collect a DPT sample at that location and

depth, and the collected limited soil samples will be analyzed for selected parameters prioritized based on nearby AOCs.

Soil samples will be submitted to a fixed laboratory for analyses with a standard (10-day) turnaround time (TAT) in accordance with the QAPP/FSP. Sampling results must meet data quality objectives and be collected from sample intervals with a minimum of 50% of recovery.

Total PCBs in soils will be compared to a screening value of 1 mg/kg for surface soils (from zero [0] to two [2] inches bgs) and shallow subsurface soils (from two [2] inches to two [2] feet bgs), and 10 mg/kg for subsurface soils (below two [2] feet bgs) for delineation and to the TSCA limit of 50 m for PCB remediation wastes.

3.2.2.2 Areas of Concern (AOCs) and Other Areas

In response to data gaps indicated in the sample data set and where previous sampling indicates additional delineation of COPC extent is warranted, sampling is planned as follows for each AOC and for other areas, not identified as AOCs. Soil sampling locations are based on the location and nature of specific AOCs and the CSM for each, as described by AOC, and for other areas in this section and in **Table 3**. **Table 3** includes a description of supplemental sampling for non-PCB COPCs where IRM1 and IRM2 were implemented. The investigation strategy is described on **Figure 5**, indicating the decisions and actions that will follow from specific results for each sample. Findings for the IRM #2 PDI (Geosyntec, 2018b) and an IRM PDI for the Former Sperry Remington Site (NYSDEC #808043), which focused on PCBs, are provided in **Appendix E**.In some cases, the sampling program at a given location is modified based on previous data, such as including fewer COPCs or fewer sampling intervals, to reflect that RI objectives are partially met at that location with previously collected data, a parallel investigation or by sampling for the IRMs.

As illustrated on **Figure 5**, for each AOC, the soil investigation results will be used to evaluate the potential for groundwater impacts by reference to the PGW SCO. In an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts **Figure 5**. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC1A Contaminated Sub-Slab Vapors

AOC1A underlies the EHS building (**Figure 3**) and has been further characterized by the SVI assessment. Additional data collection is needed to identify the source of the sub-slab vapors; this will be further investigated following the supplemental soil sampling program for potential sampling locations beneath the EHS building, described in Section 3.2, and in sampling planned for AOC 13 (**Table 3**).

AOC2 Pre-1979 Combined Industrial/Storm Sewer

AOC2 includes the pre-1979 Combined Sewer, the extent of which is shown on **Figure 6** based on information provided in historical plans (Lancy, 1967) and findings from the IRM #2 PDI (Geosyntec, 2018B; **Appendix A**) and the Site #808043 IRM PDI (**Appendix E)**. Information obtained in the Site records assessment also will be used to update the extent of sewer network.

General findings for the former combined industrial sewer are as follows:

- A thirty-inch (30-in) former combined industrial sewer line running along the eastern side of the Site was surveyed from north of Catch Basin (CB)-24 to south of CB-03. The direction of storm water flow is assumed to be to the south. That sewer line was observed to be partly to fully blocked by debris or fine-grained material in several areas. During the camera survey, the main line was observed to be predominantly dry upstream of CB-03 but contained water, fine-grained material, and debris downstream from CB-03. The line was also observed to be blocked at the northern end of CB-24 and collapsed at multiple locations along its run. The line branches to the south southeast of CB-03. The eastern branch was observed to be closed off with a brick bulkhead (i.e., a wall built to block flow) and the western branch was not accessible approximately forty-two (42) feet south of the branching. The compromised structural integrity of that combined industrial sewer line and its bulkhead to impede flow suggests that it is currently impassable to flow. Recent observations during the PDI for IRM #3 found that no water was running in the industrial sewer at the locations inspected. This indicates that the former sewer no longer receives significant surface water runoff.
- A twelve (12)-inch concrete sewer line was identified in CB-02 and appears to run to the west and to tee into the main line that connects CB-01 and CB-03. No other outlet/inlet pipe was identified in CB-02.
- Sewer lines from CB-03 to the west toward the school building were also observed to have collapsed and to be closed off with a bulkhead. Observations suggest the direction of storm water flow is toward CB-03. The compromised structural integrity and blockage of those sewer lines also suggests that they are currently impassable to flow.
- A twelve (12)-inch sewer line was surveyed from CB-01 toward CB-08. It is assumed that the direction of storm water flow was from CB-08 to CB-01. The line was observed to contain dry fine-grained material and gravel. Approximately seven (7) feet from CB-01, the twelve (12)-inch line was observed to join with a ten (10)-inch line, continuing for approximately sixteen (16) feet where it was observed to be collapsed. The compromised structural integrity of that sewer line suggests that it is currently impassable to flow.
- The thirty (30)-inch former combined industrial sewer line along the western end of the Site was surveyed from CB-25 on the STCC property toward the Site. It is assumed that the direction of storm water flow is to the south toward CB-25. The sewer line was closed off with a bulkhead just north of CB-25, suggesting that that sewer line is currently not in operation. The portion of the line that is on the EHS property could not be located from

the ground surface with GPR geophysical tools. Based on the bulkhead, there does not appear to be a current pathway from the Site to STCC via that sewer line.

Samples of fine-grained material collected from the Former Combined Industrial Sewer had exceedances of Class C Sediment Guidance Values (NYSDEC, 2014) for PCBs, metals and/or PAHs at sampling locations (from north to south) CB-24, CB-01, CB-02, CB-03, CB-06 and CB-07 (CB-07 is on STCC Property), indicating these are COPCs for AOC2.

The SC as summarized above used records review, geophysical survey and in-line camera survey to identify structural integrity, hydraulic connections to the pre-EHS and current EHS storm sewer system and the presence of accumulated fine material; the SC findings regarding fine material sampling are included on **Figure 6**. Unisys/Geosyntec has conducted in-line camera survey activities that contribute to the CSM regarding this AOC. This work built upon previous inspections of storm sewer connections constructed prior to, and as part of, EHS construction. Sampling at locations adjacent to the sewer line was conducted for the SC. Based on this work and results of sampling of fine material as documented in the SC Report (Geosyntec, 2017), data are needed to further characterize the location, extent and condition, including the presence of laterals, of limited parts of this AOC for the purposes of the RI. By focusing on identified apparent collapses, breaches and obstructions or potential breaks in the sewer that were not previously sampled for COPCs, the RI will address potential releases from AOC2. The soil sampling program includes sampling locations to characterize and delineate COPCs in identified areas, as indicated on **Figures 6, 7A, 7B, 7C and 12A**. **Table 2** provides a list of sample depths planned for each location and the analytical program for each sample. **Table 3** provides a summary of the conceptual site model specific to potential COPC release and migration from AOC2 and provides the investigation rationale. To further evaluate the extent (i.e., orientation and length) of the former industrial sewer, the former industrial sewer will be accessed at CB-2 and a camera inspection will be made of the segment between CB-2 and CB-3, to the extent practicable. This will include inspection of connections to the west of the CB2-CB3 segment (**Figure 6**), if practicable. In the SC, an attempt was made to identify access points to the former industrial sewer north of CB-15 and north and south of the EHS F and G Wings and none were identified.

A geophysical survey will be used to further characterize the extent of the former industrial sewer north of CB-15. Data gaps regarding the orientation and length of this segment, if any, remaining after the geophysical survey will be addressed by excavating up to three (3) test pits at spacings of approximately four-hundred (400) feet to the depth of the former industrial sewer (approximately seven (7) feet bgs) along its anticipated orientation extending approximately one thousand (1,000) feet north, as illustrated on **Figure 6**.

Test pits will be made at previously identified points of breaches along the former industrial sewer, primarily in the area east of the gymnasium (**Figures 7A and 7B**). This area is illustrated in cross section on **Figure 8**. The test pits will be made to confirm the alignment and depth of the sewer at these locations and to attempt to access the sewer for further camera survey. If practicable, the camera survey will be used to evaluate pipe condition and presence, location and orientation of laterals.

Data gaps regarding the orientation of the segment beneath EHS F and G Wings, if any, after the Site records assessment, will be investigated by a geophysical survey north and south of and immediately adjacent to the EHS F and G Wings and by excavation of a test pit north of and immediately adjacent to the EHS F and G Wings, at the approximate location indicated on **Figure 12B**. Where the sewer is accessed by excavations described above, if fine-grained material is present it will be sampled and analyzed for TAL metals, SVOCs and PCBs.

As illustrated on **Figure 5**, for each AOC, the soil investigation results will be used to evaluate the potential for groundwater impacts by reference to the PGW SCO. Where PGW SCOs are exceeded, a temporary well will be installed and sampled for the COPCs that exceed PGW SCOs to evaluate the soil to groundwater pathway. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts (**Figure 5**). The groundwater sampling plan is described further in **Section 3.2.3**.

AOC2A, 2B 18-in Clay Pipe at SE Property Corner (2A) and Drywell at SE Property Corner (2B) and 5-Foot Box Culvert

These AOCs are in the southeast corner of the Site (**Figure 9**) and were previously addressed in part by sampling for IRM #2 PDI (Geosyntec, 2018b) and an IRM PDI for the Former Sperry Remington Site (NYSDEC #808043). COPC-impacted soil has been documented under CB-15 and CB-15 is a potential source for COPCs. Connecting structures to CB-15 including the five (5)-foot box culvert (**Figure 9**) are included in the AOC. Findings from the IRM #2 PDI and the Site #808043 IRM PDI are provided in **Appendices A and D, respectively**. Previously collected data will be incorporated into the RI Report.

A brick manhole structure CB-15 was observed during an IRM PDI for the Former Sperry Remington Site (NYSDEC #808043) (Geosyntec, 2018c). The location of CB-15 is shown on **Figure 6**. In-line camera surveys, test pitting, and fine-grain material sampling and analyses were conducted as part of IRM PDI for the Former Sperry Remington Site (NYSDEC #808043). Subsurface infrastructure layout in the southeastern corner of the Site is documented in the IRM PDI for the Former Sperry Remington Site (NYSDEC #808043) (**Appendix E**). General findings from that investigation relevant to the EHS property are provided in **Appendix E** and are summarized as follows:

- Former industrial sewer connections on EHS property from CB-03 and CB-15 are not inactive;
- A clay tile pipe connection to CB-15 from the northwest extends approximately 395 feet. Penetration by a two-inch PVC pipe and accumulated sand prevented further investigation. The location is consistent with a former industrial sewer line along the eastern EHS property boundary shown on historical maps. The compromised structural integrity of this industrial sewer line suggests that it is currently impassable to flow.

- CB-15 is connected to a 5-ft box culvert that enters a former oil skimmer on STCC property from the northeast. The culvert was wet with abundant fine-grained material, cobbles, wood, and standing water. A thirty-six-inch (36-inch) brick line connects to the culvert at a distance approximately ten (10) feet southwest of CB-15. The line contained abundant roots, entering through the edges of the brick, abundant fine-grained material, cobbles, wood, and standing water. While the camera survey was abandoned at distance of approximately fifty (50) feet, the line appeared clear farther on. The direction of the line appears to be toward CB-03. Test pitting to a depth of eleven (11) feet did not encounter the connection to the 5-ft culvert. Because of the connections to the 5-ft box culvert downstream of CB-6 and upstream of CB-15 noted above are no longer active, the 5-ft box culvert inlet to the former oil skimmer is considered to be inactive.
- An 18-in clay pipe (AOC-2A) connects to a culvert on STCC property for discharge to Coldbrook Creek on the north side approximately one hundred eighty (180) feet from the western end of that culvert. No flow was observed entering that culvert from this line during the 2012 IRM PDI (Geosyntec,2013). No connections to that culvert were observed from CB-15 during the 2017 IRM PDI. A connection to the east from CB-15 was plugged with concrete and may have previously connected to the 18-in clay pipe and that culvert as an overflow bypass of the former oil skimmer. The former industrial sewer lines on EHS property do not appear to have a currently active direct connection to the culvert on STCC property.
- Fine-grained material was collected from CB-15 from the upper two (2) inches and between (2) and ten (10) inches for laboratory analyses. COPCs detected included PCBs, metals, and SVOCs as summarized in **Appendix F**.

Sampling along the eastern Site boundary for the SC characterized COPCs in soil near the Former Combined Industrial Sewer in this area (Geosyntec, 2017). Sampling of fine-grained material in the former industrial sewer has been conducted (**Appendix F**). Soil sampling near an eighteen (18) inch clay pipe (AOC-2A) and CB-15 at the southeastern property corner (AOC-2B) was conducted for the IRM #2 PDI (Geosyntec, 2018b) (**Appendix A**).

A test pit will be made at the approximate location of the 18-in clay pipe to further evaluate former connections and sewer alignment at this location (**Figure 9**). An attempt will be made to access the 18-in pipe through the test pit for camera survey.

The soil sampling program for AOC2A, 2B includes sampling locations to characterize and delineate COPCs at locations indicated on **Figure 9.** In accordance with DER-10, soil samples will be collected within two (2) feet of the eighteen (18)-inch Clay Pipe and CB-15 and at a depth corresponding to the depth of the CB-15 invert **Figure 9**. The soil sampling plan to the east is limited by the adjacent steep railroad embankment and subsurface utilities (NYSEG gas line) (**Figure 9**). A soil boring will be placed at the location of the five (5)-foot box culvert and at a depth corresponding to the invert depth of the culvert (**Figure 9**). **Table 2** provides a list of sample depths planned for each location and the analytical program for each sample. **Table 3** provides a

summary of the CSM specific to potential COPC release and migration from the AOC and provides the investigation rationale.

To assess potential groundwater impacts near AOC2A / 2B, groundwater sampling is planned near CB-15 (**Figure 9**), using a temporary well installed at the time of soil sampling at this location as described further in **Section 3.2.3**. The location of the temporary well is placed as close as possible to CB-15 to detect migration from soil to groundwater at this location.

As illustrated on **Figure 5**, for each AOC, the soil investigation results will be used to evaluate the potential for groundwater impacts by reference to the PGW SCO. Where PGW SCOs are exceeded, a temporary well will be installed and sampled for the COPCs that exceed PGW SCOs to evaluate the soil to groundwater pathway. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location 30 feet downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts laterally and (**Figure 5**). The groundwater sampling plan is described further in **Section 3.2.3**.

AOC2C Drywell Near Building 49

AOC2C is a former feature identified as a drywell near former Building 49 in the northeastern part of the Site (**Figure 10A**). The physical remnants of this structure are not visible by way of surface reconnaissance. The feature appears to have been located along an alignment extending parallel to the Site boundary. GPR will be undertaken to attempt to locate this structure, supported by information from historical plans. Further assessment, as needed, will be planned based on GPR results. If geophysical results are inconclusive, a test pit will be excavated to a depth of approximately five (5) ft bgs, on a perpendicular to the Site boundary, to attempt to locate the feature. This area also will be addressed in sampling of AOC3A, as described below.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC2D Manhole SW-73 Near Building 28A

AOC2D is Manhole SW-73 near Former Building 28A (**Figure 4**); this area was previously addressed by sampling and remedial actions for IRM #1 (Geosyntec, 2018a). and the FFC PDI. Further remedial actions including sampling are planned for this area in summer 2019 as Phase 1 of FFC IRM.

Former monitoring wells SSHS-15S/15D were located near AOC2D. A replacement monitoring well SSHS-15S will be installed at the approximate location of former SSHS-15S following completion of the FFC PDI. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC2E Waste Pit near Building 44

This AOC underlies the EHS building (**Figure 4**) and will be addressed following the supplemental soil sampling program for potential sampling locations beneath the EHS building, described above.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC3 1979 Storm Sewer

AOC3 includes the 1979 storm sewer (a.k.a. the Elmira High School storm water drainage system), the extent of which is shown on **Figure 4.** The findings of the Site characterization as summarized above indicate that the feature has been characterized for purposes of the RI, with additional historical review being conducted for the RI as described in **Section 3.2.1**. Previously-collected data will be incorporated into the RI Report.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC3A 1979 Drywell Field

AOC3A is comprised of eight (8) discrete areas characterized by NYSDEC as drywell fields (**Figures 10A, B, C, D, F and 11B**). **Figures 10E, G, H and 11A** illustrate nearby areas in the north portion of the Site. One (1) small area near the tennis courts was characterized by sampling associated with IRM #1. The other seven (7) areas will be addressed by a soil sampling as described in **Table 3**. **Table 2** provides a list of sample depths planned for each location and the analytical program for each sample.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC4 Earthen Waste Pits near EHS Gym and Pool

This AOC underlies the EHS building and extends to the east (**Figures 7C and 12A**). The area extending outside the building will be addressed by a soil sampling program that includes planned sampling locations to characterize and delineate COPCs, including SVOCs, as indicated on **Figure 12**. **Table 2** provides a list of sample depths planned to cover the elevations of the former earthen waste pit (former structure elevations of AOC4 were from approximately 852 to 857 feet mean sea level [msl]). The sampling program will provide further investigation of oil-impacted soil at AOC10D (Empire, 1977), parts of which overlap AOC4, as described for AOC10D below.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC5 Sludge Tanks/Beds/Brick Pits near Building 64

This AOC underlies the EHS building (**Figure 4**) and will be addressed following the supplemental soil sampling program for potential sampling locations beneath the EHS building, described above.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC6 Concrete Vaults

AOC6 includes discrete areas characterized by NYSDEC as former concrete vaults that are located north of the EHS building and one discrete area straddling the southwestern Site boundary (**Figure 4**). The area north of the EHS building is addressed by the RI of the FFC and PDI activities for IRM #3. Two other discrete areas identified as part of AOC6 lie off Site to the south and as such are not included in the RI for this Site. The area straddling the southwestern Site boundary (**Figure 13**) will be sampled for COPCs as listed in **Table 2**.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-

bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC7 Drywell Structures

This AOC underlies the EHS building (**Figure 4**) and will be addressed following the supplemental soil sampling program for potential sampling locations beneath the EHS building, described above.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC8 Westinghouse Transformer Spill near Building 28A

AOC8 is the area of a former Westinghouse PCB release (**Figure 4**). This area is addressed by the RI of the FFC and PDI activities for IRM #3 and through sampling and remedial actions for IRM #1 (Geosyntec, 2018a); no additional sampling is needed for the RI.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC9 Oil Storage and Handling, Oil House

AOC9 is comprised of two discrete areas characterized as former oil houses, the larger of which is located on the eastern edge of the Site, the smaller in the southwest part of the Site (**Figure 4**). The area on the eastern edge of the Site is addressed by the RI of the FFC and PDI activities for IRM #3. Soil COPC concentrations from the RI and PDI activities at the FFC will be compared to SCOs. This evaluation will be used to update the CSM and groundwater investigation as described in **Section 3.2.3**. The smaller area in the southwest part of the Site entirely underlies the EHS building and will be addressed following the supplemental soil sampling program for potential sampling locations beneath the EHS building, described above.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-

bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC10 Subsurface Soils Exceeding SCOs

AOC10 is comprised of several discrete areas of COPC exceedances, listed below. These areas are addressed by other sampling as part of the RI, as part of the RI or PDI for IRM #3 or were addressed by sampling or remedial actions for IRM #1, as described below. Soil COPC concentrations will be compared to SCOs. This evaluation will be used to update the CSM and groundwater investigation as described in **Section 3.2.3**. In addition to RI data, PDI data for IRM #3 pertains to AOC10 and will update the CSM.

A sheen was observed at the water table during groundwater sampling in previous investigations (Geosyntec, 2017). A review of groundwater data indicates the absence of COPCs above TOGS at locations where a sheen was observed (MW-10, MW-13, MW-33, MW-11S). The sheen indicates potential VOC, SVOC or DRO impacts to groundwater, the investigation of which is described in **Section 3.2.3**.

10A - Metals at B43, B42, B52, B24 and B35	Sampling will be conducted to delineate metals in the area of B43 and B42. Sampling for AOC16 and AOC17 will be conducted to delineate metals in the B52 area. Remedial actions for IRM #2 address delineation of metals in the area of B24 and B35.
10B - PCBs at B3, FB7 and B15, VOCs at FB5 and SVOCs at FB6	Sampling for the RI of the FFC and PDI activities for IRM #3 will be conducted to delineate PCBs in the area of B3 and FB7, VOCs in the area of FB5 and SVOCs in the area of FB6. Remedial actions for IRM# 1 address PCBs in the area of B15.
10C - Petroleum Impacts	Sampling for the RI of the FFC and PDI activities for IRM #3 will be conducted to delineate areas of petroleum impacts.
10D - Oil in Shallow Soils, Oil in Deep Soils	Previous investigation of the EHS building footprint (Empire, 1977) encountered oil-impacted soil. Two areas characterized by NYSDEC as oil in shallow soils underlie the EHS Building. Previously collected SVOC data for B26 and B29-A characterize shallow soil east of the EHS Building. Three areas characterized as oil in deep soils mostly underlie the EHS building. These areas will be addressed following the supplemental soil sampling program for sampling locations beneath the EHS building, described above. Sampling will be conducted at six (6) soil borings at and downgradient from areas of oil-impacted soil, east of the gymnasium

	(**Figure 8**). These samples will be collected at and below the water table to evaluate the smear zone and will be analyzed for VOCs, SVOCs and DRO. Sampling results will be compared to SCOs with further delineation to be conducted as described in **Figure 5**. In addition, AOC10D is being investigated as part of AOC4 and AOC17.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC11 VOC- and Petroleum Impacted Groundwater, Measured Oil Product, and PCB-Impacted Groundwater

AOC11 includes areas where groundwater impacted by COPCs or measurable oil product, also known as light nonaqueous phase liquid (LNAPL), has been detected (**Figure 4**). VOC impacted groundwater has been detected at MW-8 and MW-30, petroleum-impacted groundwater has been detected at MW-8, MW-10, MW-32, MW-34, and MW-41; a sheen, which may be an indication of petroleum impact, has been observed at MW-11S; and PCB impacts have been detected at MW-8, MW-15S and MW-41 and (temporary well) B-510.

The lateral and vertical extent of impacts at the FFC, including the sheen observed at MW11S, is being investigated as part of the IRM #3 PDI. Results of soil sampling at locations upgradient from the groundwater impacted areas will be assessed to identify potential sources of groundwater impacts. MW-15S will be replaced following Phase 1 IRM#3 activities and used to sample groundwater and monitor water levels.

Existing and new groundwater monitoring wells, and temporary wells, will be used to sample groundwater and monitor water levels to investigate the fate and transport of COPCs in groundwater at and downgradient of potential source areas and impacted areas. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts (**Figure 5**). The groundwater sampling plan is described further in **Section 3.2.3**.

AOC12 Plating, Heat Treatment and Tumbling Areas

AOC12 is characterized as being the former location of plating, heat treatment and tumbling areas on the southwestern side of the Site (**Figure 4**) and at former Buildings 49 and 67E on the eastern

side of the Site (**Figure 4**). This AOC partly underlies the EHS building but mostly lies outside to the west of the building and is overlapped by AOC16 and AOC17. The location of AOC12 on the eastern side of the Site is overlapped by AOC16 and AOC17. As it is overlapped by other AOCs, AOC12 is addressed by sampling of those AOCs as described below.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC13 Metals Cleaning, Vapor Degreaser and Solvent Still

AOC13 is characterized by NYSDEC as being the former location of metal cleaning, vapor degreaser and solvent still areas (**Figure 4**). This AOC partly underlies the EHS building but mostly lies outside to the north of the building, and is overlapped by AOC16 and AOC17, and is addressed by sampling of those AOCs as described below.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC14 Power Washer, Rust Prevention Dip Operation

AOC14 is characterized by NYSDEC as being four (4) discrete areas including the former paint shop and two (2) on-Site and one (1) off-Site (to the south) areas characterized as being connected to the former tumbling sludge settling pond (**Figure 4**). The northernmost area underlies the area where remedial actions were conducted for IRM #1 and no further sampling is needed at that location. The other two (2) on-Site areas will be addressed by sampling for SVOCs and metals (**Figure 4**), as these locations have been previously sampled for PCBs.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC15 Wire Pickling Area

AOC15 is characterized by NYSDEC as being two discrete former wire pickling areas, one of which is off Site to the south, and not part of the RI (**Figure 4)**. The on-Site part of AOC15 partly underlies the EHS building but extends outside of the EHS building to the east. Seven (7) locations have been sampled in this area previously for PCBs and no further sampling for PCBs is needed.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC16 Machine Shop Area

AOC16 is characterized by NYSDEC as being the location of former machine shop areas, with four discrete areas on Site (**Figure 4**). The northern portion of AOC16 is coincident with and slightly larger than a possible plating area portion of AOC17. While the location of former machine shop and plating areas is known based on historical records, there are no records regarding decommissioning and demolition of the former buildings at this location. Consequently, it is unknown if there are COPCs in soil in the area of the former building footprint. To investigate potential COPC-impacted soil, sampling is planned at fourteen (14) locations in this area (**Figures 10A, B, G, H and 11 A**).

The southernmost part of this area that lies slightly north of the football field and two discrete areas at the current football field (**Figure 4**) are being investigated by the RI of the FFC and PDI activities for IRM #3.

A significant part of AOC16 on the western side of the Site (**Figure 4**) has been addressed by the SC (Geosyntec, 2018a). **Figure 4** illustrates the area of AOC16 excavated and replaced with clean fill during IRM #1. PCB-impacted soil documented along the northern sidewall of the IRM#1 North Excavation were located on the northern end of the tennis courts (**Figure 11B**). To investigate this potential source, two (2) temporary wells are planned in the area of the PCB-impacted soil. Because groundwater has not been investigated in this area previously, groundwater samples will be analyzed for TAL metals in addition to PCBs at these locations.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

TCE Investigation Soil Area

One (1) AOC16 area on the southwestern part of the Site partly underlies the EHS Building, but mostly lies outside to the west and north of the building in an area coincident with AOC12, AOC13 and AOC17. This is the area where TCE was detected by ECSD contractors in grab soil samples at concentrations of up to 10,000 µg/kg (**Appendix G**) during the EHS stormwater sewer installation (**Figure 12A and 12B**).

Sampling will be conducted at eight (8) locations in this area to further assess the extent of TCE-impacted soil and the potential for migration to groundwater. The extent of groundwater impacts will be further assessed as described in **Section 3.2.3**. Soil sampling for this area will start at a point outside the EHS building, near Room 127 (**Figure 12B**), to delineate the lateral and vertical extent of COPCs. Groundwater sampling will be based on soil sampling results exceeding PGW SCOs (**Figure 5**). **Table 2** provides a list of sample depths planned for each location and the analytical program for each sample.

Sampling locations may be relocated based on the Site records assessment and findings from the test pit west of the building as described for AOC2. Results, including comparison to PGW SCOs, will be used to evaluate potential infrastructure(s) (such as stormwater sewer system) as a potential TCE soil vapor source in Room 148 and update the CSM.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

AOC17 Possible Disposal Areas

AOC17 is characterized by NYSDEC as being i) the former location of a possible plating area in the northern part of the Site, ii) four (4) former potential disposal areas, three (3) on the southwestern part of the Site and one (1) on the southeastern part of the Site, iii) a former acid drainage pit in the southeastern part of the Site and iv) a former coal pile located in the southeastern corner of the Site (**Figure 4**). The possible plating area is coincident with AOC16, and sampling locations for AOC16 in this area address both AOCs (**Figure 4**). Two (2) of the former disposal areas and the former acid drainage pit underlie, or nearly entirely underlie, the EHS Building (**Figure 4**). Consequently, these parts of AOC17 will be addressed following the supplemental soil sampling program for sampling locations beneath the EHS building, described above. Sampling locations in the area east of the gymnasium may be relocated based on a review of the former industrial sewer alignment south of CB-02, to be conducted as part of the building records review and supplemented by a camera inspection as described for AOC2. **Figure 4** illustrates the area of AOC17, which includes the former coal pile area, excavated and replaced with clean fill during IRM #2 (Geosyntec, 2018b). One (1) former disposal area on the southwestern side of the Site partly underlies the EHS Building, but mostly lies outside to the west and north of the building

in an area coincident with AOC16 (**Figure 4**). Sampling of this area is addressed by sampling of AOC16. One (1) former disposal area on the southeastern part of the Site is coincident with parts of AOC2 and AOC4 (**Figure 4**). Samples as listed in **Table 2** from the area east of the gymnasium will be analyzed for SVOCs. Sampling for those AOCs in this area will be used to characterize this part of AOC17. The sampling program to investigate AOC17 east of the EHS building will provide further investigation of down-gradient (eastern) extent of COPCs associated with oil-impacted soil at AOC10D (Empire, 1977) (**Figure 7A and 7B**).

The sampling plan for AOC17 is described in **Table 3**, is based on SC results, and accounts for spatially overlapping AOCs as described above. Sampling results will be compared to SCOs with further delineation to be conducted as described in **Figure 5**.

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts. The groundwater sampling plan is described further in **Section 3.2.3**.

Other Areas

The sampling plan for other areas (i.e., areas of the Site not otherwise demarcated as an AOC) is described in **Table 2**. The largest contiguous area not formally defined as an AOC is located at the northern end of the Site (**Figure 4, 10A – H, 11A and 11B**). Another such area is located north of the tennis courts and another one is located west of the rear parking lot (**Figure 15A, B and C**). In the northern end of the Site a former building for steel storage was located on the eastern property boundary, while the remainder was used for parking or was open space. The area north of the tennis courts was the former location of a garage, rec hall and cafeteria. The area west of the rear parking lot was the former location of building 66, used for storage. There is no indication of these areas having been used in a manner that suggests potential for release of COPCs to the environment. Thus, sample locations are not targeted to a specific location but are spread across the areas. Results will feed the soil and groundwater sampling decision flowchart (**Figure 5**). The prior use of these areas will be further evaluated as described in Section 3.2.2.3, and supplemental sampling will be planned in response to information suggesting a potential AOC. Any such supplemental sampling will be biased toward location and the depth biased toward likely horizons of impacts, including an RI for groundwater consistent with DER-10 3.7.2(b) and (c).

As illustrated on **Figure 5**, in an AOC where PGW SCOs are exceeded, a temporary well will be installed at a point determined to be best situated (e.g., closest to the soil sample with maximum exceedance) to evaluate the soil to groundwater pathway. The temporary well will be sampled for the COPCs that exceed PGW SCOs. If groundwater results exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts vertically. The groundwater sampling plan is described further in **Section 3.2.3**.

3.2.2.3 Identification and Evaluation of Potentially Unidentified Areas of Concern

For the purposes of the RI, there is uncertainty regarding potential on-Site disposal from when the Remington Rand Plant was decommissioned and demolished in the 1970s. Some on-Site disposal areas have been identified as AOCs, with specific RI plans for identified AOCs described herein. To comprehensively address potential unidentified on-Site disposal areas from decommissioning and demolition of the Remington Rand Plant, an aerial photography assessment is planned to be conducted prior to field work. This planned assessment will include side-by side comparison of aerial photography from dates that are pre-decommissioning with that from dates that are post-decommissioning. Readily available historical aerial photographs will be reviewed and those deemed by Unisys to have best resolution will be selected for use in the assessment. A historical photography provider (e.g., EDR) will be contracted to provide photographs for this assessment, which will include before and after comparisons used to identify potential disposal areas indicated by disturbed ground, soil piles, grading and other indications of land elevation changes. The findings of the assessment are intended to supplement the findings of the RI soil investigation program. Specific soil boring locations may be modified based on these results, with such modifications communicated to NYSDEC for approval prior to field work. The RI soil investigation will include a comparison of soil COPC results to PGW SCOs as described on **Figure 5**.

3.2.2.4 Well and Surface Water Receptors

A search was conducted for: (1) all monitoring wells and domestic wells potentially impacted by the Site, and (2) irrigation, industrial and/or public supply wells within one half mile of the Site, in accordance with DER-10 Sect 3.2.7(b)7-9. Using available DEC, NYSDOH, and Chemung County Health Department records, no wells were identified that would be potentially impacted by the Site or that were within one half mile from the Site. Well locations nearest the Site are shown in **Figure 16**, which indicates that the closest well is located 1.6 miles from the Site. Nearest bodies of surface water include Miller Pond, Coldbrook Creek and associated wetlands located approximately 0.25 miles east and southeast of the Site.

3.2.3 Groundwater Investigation

The groundwater investigation for the RI will be consistent with DER-10 Section 3.7.2(b) and (c) and is intended to characterize the source and delineate the vertical and horizontal extent of COPC TOGS exceedances in groundwater.

3.2.3.1 Location-Specific Investigation Activities

AOC11 and AOC13 are identified as AOCs where groundwater investigation is needed, as described below. Groundwater investigation also will be conducted at those AOCs where soil sampling, as described in Section 3.2.2, shows detection of COPCs exceeding PGW SCOs at or below the water table. The groundwater investigation plan is based on the CSM for each AOC as described in **Table 3** and below.

The groundwater investigation will begin with an inventory of existing monitoring wells to assess which of the monitoring wells listed in **Table 4** and illustrated on **Figure 2** currently are usable for data collection. The inventory will be followed by one (1) round of Site-wide groundwater sampling from usable monitoring wells, which will include a synoptic round of water-level measurements. LNAPL in Site monitoring wells, if observed, will be measured as possible. If sufficient LNAPL volume is available, it will be sampled and characterized using standard test methods for VOCs and SVOCs consistent with DER-10. The presence of DNAPL will be assessed with monitoring at the base of the intermediate-zone monitoring wells.

AOC11 and AOC11A VOC- and Petroleum-Impacted Groundwater, Measured Oil Product, and PCB-Impacted Groundwater

AOC11 and AOC11A includes areas where groundwater impacted by COPCs or where measured oil product, also known as light nonaqueous phase liquid (LNAPL), has been detected (**Figure 4**). VOC-impacted groundwater has been detected at MW-8, MW-30, and temporary well B2542 (near MW-11S). Petroleum-impacted groundwater has been detected at MW-8, MW-10, MW-32, MW-34, and MW-41, while a sheen, which may be an indication of petroleum impact, has been observed at MW-11S. PCB impacts have been detected at former monitoring well MW-15S, MW-34 and MW-41.

The extent of groundwater impacts characterized by VOC-impacted groundwater detected at MW-8 and MW-30 will be evaluated by groundwater sampling from two temporary wells located approximately thirty (30) feet downgradient (east) of these two wells (**Figure 7A and 7B**). The sampling plan is listed in **Table 5**. Sampling results will be compared to TOGs with further groundwater delineation to be conducted as described on **Figure 5**.

The extent of TCE-impacted groundwater downgradient of B2542 will be evaluated by sampling from MW-11S. The potential source for TCE impacting B2542 will be evaluated based on groundwater sampling from temporary wells sampled during the FFC PDI. If the upgradient extent of TCE impacts to groundwater at the FFC is not delineated by the FFC PDI, an additional temporary well will be sampled at a location upgradient from the FFC. The location of this temporary well, if needed, will be based on the groundwater flow direction established based on groundwater level measurements from SSHS-MW47 and two new monitoring wells west and north of SSHS-MW47 (**Figure 12B**).

The extent of groundwater impacts characterized by sampling at B510 will be evaluated by collecting groundwater samples from two (2) temporary wells located approximately thirty (30) feet downgradient (east) from B510 (**Figure 7A**). The sampling plan is listed in **Table 5**. Sampling results will be compared to TOGs with further groundwater delineation to be conducted as described in **Figure 5**.

Proposed well SSHS-MW-49: Vertical extent of SVOCs TOGS exceedances will be delineated near SSHS-MW30, by sampling at proposed monitoring well SSHS-MW49 near SSHS-MW30 (i.e., within twenty [20] feet) at the depth of twenty-five (25) – thirty-five (35) feet bgs. This is below the well screen depth of seventeen and nine tenths (17.9) feet bgs at SSHS-MW30 and near

the base of the uppermost water-bearing zone (i.e., in the intermediate depth zone). The area is illustrated in cross section on **Figures 13 and 14**.

Proposed well SSHS-MW-50: Vertical extent of PCBs exceedances will be delineated at SSHS-MW41, which was the location showing the maximum PCB concentration in previous sampling. Vertical extent will be assessed by sampling at a newly installed monitoring well SSHS-MW-50 near SSHS-MW41 (i.e., within twenty [20] feet) at the depth of twenty-eight (28) – thirty-eight (38) feet bgs. This depth is below the well screen depth of seventeen (17) – twenty-seven (27) feet at SSHS-MW41 and is at the base of the uppermost water-bearing zone. The area is illustrated in cross section on **Figure 8**.

AOC13 Metals Cleaning, Vapor Degreaser and Solvent Still

As described in Section 3.2.2, AOC13 is the former location of metal cleaning, vapor degreaser and solvent still areas (**Figure 4**). This AOC partly underlies the EHS building but mostly lies outside to the north of the building and is overlapped by AOC16 and AOC17. Groundwater investigation will be conducted where VOCs were detected in soil above PGW SCOs in the area of SSHS-MW47 and TCE was detected in soils excavated from the parking lot south of the Main Parking lot and west of A Wing in Summer 2017 2017 (the TCE Investigation Area, **Table 3**).

Proposed well SSHS-MW-48: Potential groundwater impacts from TCE in soils in the parking lot area near SSHS-B92 and SSHS-B94, which is an area on the west side of the Site, will be further assessed by sampling at a newly installed monitoring well SSHS-MW-48 near SSHS-B92 (i.e., within twenty [20] feet) at the depth of eighteen (18) - twenty-eight (28) feet bgs. This is below the well screen depth of SSHS-B92 and hydraulically downgradient of SSHS-B92 and SSHS-B94. TCE was detected at concentrations just above TOGS near water table at SSHS-B92 and SSHS-B94, both of which were sixteen (16) feet deep. A review of historical data collected at SSHS-MW47 indicates an absence of TCE exceedances. Monitoring well SSHS-MW47 delineated the vertical extent of TCE at this location.

Downgradient extent of TCE-impacts to groundwater will be further assessed by groundwater sampling from a temporary well east of SSHS-B92 / Proposed SSHSMW-48 (**Figure 12B**).

Additional groundwater flow and chemistry data from this area will be collected to support the groundwater CSM. This will be conducted by installing two monitoring wells, one west and one north from the TCE impacted soil area. These wells will be included in synoptic rounds of groundwater sampling and water level measurements as described in Section 3.2.3.2.

3.2.3.2 Site-Wide Groundwater Data Collection Activities

Site-wide groundwater data collection activities will include 1) assessment of the existing monitoring well network to determine usability for data collection; 2) installation of new monitoring wells to improve delineation of COPC TOGS exceedances in groundwater at specific locations described in **Section 3.2.3.1**; 3) one (1) round of Site-wide groundwater sampling from usable monitoring wells including synoptic water level measurement; and 4) a second round of groundwater sampling at monitoring wells with TOGS exceedances including synoptic water level

measurement. LNAPL in Site monitoring wells, if observed, will be measured as possible. If sufficient LNAPL volume is available, it will be sampled and characterized using standard test methods for VOCs and SVOCs consistent with DER-10. Findings from the soil investigation, particularly comparison of results to PGW SCOs, and each round of groundwater data collection, including temporary well sampling conducted in November 2018 at the FFC, will be used to update the CSM and assess attainment of RI objectives.

Groundwater Sampling and COPC Analysis

Once new monitoring wells described in **Section 3.2.3.1** are installed and the existing monitoring well network (**Table 4**) has been inventoried and assessed for usability, two (2) rounds of Site-wide groundwater samples will be collected. Five (5) existing monitoring wells were sampled in 2018 for the RI and PDI activities at the FFC: MW-11S, MW-36, MW-38, MW-39, MW-40 and MW-44. Data for those wells from that sampling event will be used for the Site-Wide RI.

Groundwater sampling will be scheduled to occur in the summer and fall to represent conditions during anticipated times of seasonal high and low groundwater conditions. Samples will be analyzed for PCBs, VOCs, SVOCs, and TAL metals. Samples for TAL metals will be unfiltered and filtered.

To assess potential groundwater impacts near AOC2A / 2B, groundwater sampling is planned near CB-15 (**Figure 9**), using a temporary well installed at the time of soil sampling at this location. The groundwater sampling plan is described in **Table 5**.

Document review and field observations related to the former railroad siding area information will be used to assess the necessity of up to two (2) temporary wells to evaluate potential groundwater impacts at the former railroad siding area.

The results of the first round of groundwater sampling will be compared to TOGS and those wells with an exceedance will be sampled in the second round. If groundwater results at a monitoring well exceed TOGs, a temporary well will be installed and sampled at a location downgradient (east northeast) and at the base of the water-bearing unit (approximately 45 feet bgs) to delineate groundwater impacts **Figure 5**).

Following groundwater sampling and analysis the monitoring well network will be evaluated in terms of its effectiveness for supporting the objective of delineating the vertical and horizontal extent of COPC TOGS exceedances in groundwater. Groundwater results will be compared to TOGS to identify areas of exceedances. Water level measurements will be used to map horizontal groundwater flow direction, and groundwater flow rates will be estimated based on hydraulic conductivity and gradient in the water bearing zone. This information will be used to delineate areas of TOGS exceedances for each area of COPC-impacted groundwater.

3.2.3.3 Groundwater Sampling and Analysis for 1,4-Dioxane and Per- and Polyfluoroalkyl

Substances (PFAS)

As requested, groundwater samples from SSHS-MW47, SSHS-MW30 and SSHS-MW11-S, will be analyzed for 1,4-dioxane and PFAS (as they are described in correspondence to Unisys from NYSDEC dated 16 May 2018); one round of sampling will be conducted. Based on previous groundwater sample results that indicate the absence of 1,1,1-trichloroethane or its breakdown products in site groundwater, it appears unlikely that 1,4-dioxane will be detected. SSHS-MW30 was selected as having had VOC concentrations above TOGS. MW11-S was requested for monitoring by NYSDEC. SSHS-MW47 was selected as being hydraulically up gradient of SSHS-MW30. In addition, groundwater samples will be collected from two temporary wells situated in the northern end of the Site, to characterize conditions not associated with an AOC and analyzed for 1,4-dioxane and PFAS. These samples are intended to represent conditions in areas of the Site not characterized by existing monitoring wells, with one located on the upgradient boundary of the Site and one on the downgradient boundary of the Site. Results from the upgradient location will be used to assess emerging COPC concentrations, if any, impacting the Site from off Site locations. Sampling will be conducted in a manner consistent with the request for sampling of 1,4-dioxane and PFAS from NYSDEC dated 16 May 2018, and its attached guidance dated April 2018.

3.2.3.4 Groundwater Data Evaluation

Delineation of the extent of COPC exceedances of TOGS will be based on all relevant data comprised in the CSM: i) source, ii) nature of COPC, iii) concentration, iv) location and depth of sampling, v) hydrogeologic conditions, vi) groundwater flow direction and vii) hydraulic gradient.

Assessment of groundwater COPCs will include a comparison of soil COPC results to PGW SCOs and delineation of groundwater COPCs that exceed groundwater standards (i.e., TOGS), if any. Groundwater investigation findings, including those from pre-RI activities, will be used to characterize remediation and attenuation of COPCs related to the Site. Findings from reports prepared under the direction of NYSDEC regarding petroleum remediation and attenuation will inform the CSM regarding petroleum COPCs. The presence of acetone at a concentration above TOGS at SSHS-MW41 will be evaluated using RI groundwater sampling data. If results show acetone concentration above TOGS, the effect of acetone on PCB solubility will be characterized based on literature values and will be described in the RI Report.

The groundwater investigation also will support the CSM regarding depth to water, groundwater flow direction, and groundwater flow velocity. Data from the synoptic round of water level will be used to interpret a groundwater potentiometric surface map. The map will be used to evaluate groundwater flow direction and horizontal hydraulic gradient.

3.2.4 Soil Vapor Intrusion Investigation

A Soil Vapor Intrusion Study and SSDS Evaluation has been conducted separately from the RI. Preliminary results were provided to NYSDEC/NYSDOH on 20 July 2018. Results of that study and evaluation will be reported with the RI Report as described in **Section 7**.

3.2.5 Qualitative Human Exposure Assessment

A qualitative human health exposure assessment will be completed in accordance with DER-10. The qualitative human health exposure assessment will be developed based on data collected to date and readily available information provided in the 2018 Site Management Plan and NYSDOH Health Consultation Reports for Southside High School (NYSDOH, 2003 and 2010). The assessment will be presented in the form of a summary table based on the template provided in the Appendix 3B of DER-10.

4 FIELD ACTIVITIES PLAN AND QUALITY ASSURANCE / QUALITY CONTROL (QA / QC) PROTOCOLS

Field activities will include surface, shallow subsurface and deep subsurface soil sampling and groundwater sampling. This section summarizes field activities to be conducted for the RI. Methods and procedures for sampling and QA/QC are presented in the QAPP/FSP in **Appendix D**.

4.1 Field Activities

A Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP) (**Appendix D**) has been prepared to present the quality assurance/quality control (QA/QC) measures and describe methods and procedures that will be followed during completion of the RI activities.

Appendix D lists analytical methods, containers, preservatives, and holding times for solid, water, air and sub-slab vapor analyses. Quality control samples, including field duplicates, matrix spike/matrix spike duplicates, trip blanks, and equipment blanks, will be collected at the frequency specified in the QAPP/FSP.

4.1.1 Soil Investigation

Data gaps in soil data at the Site have been evaluated through the current CSM, which is based on historical soil analytical data and AOCs identified by NYSDEC. The proposed soil investigation will include the following to address those data gaps:

- Surface (i.e., zero [0] to two [2] inches bgs) and shallow subsurface soil sampling to verify that surface soils at the Site meet the Restricted Residential SCOs presented in 6 NYCRR Subpart 375;
- Deep subsurface soil sampling to characterize the nature and extent of soil COPCs, and evaluate AOCs as potential sources, potential migration pathways and potential points of exposure.

Sampling locations for soil are illustrated on **Figures 6 through 14**. Subsurface soil samples will be collected at the depth intervals and for the analytes listed in **Table 2**. Soil borings will be installed to the shallow water table or refusal (if shallower). Visual observations of the recovered samples will be recorded. Soil type will be assessed by visual observation of samples at the time samples are retrieved to the ground surface. Sampling methodology will follow the QAPP. A qualitative assessment will be recorded as to whether the material being sampled is relatively consistent (i.e., visually similar) with other samples. Samples will be screened with a photoionization detector. Sample designations will be in accordance with the QAPP/FSP. Soil samples will be submitted to a fixed laboratory for analyses specified in **Table 2**.

4.1.2 Groundwater Investigation

4.1.2.1 Site Hydrogeologic Conditions

An attempt to locate each monitoring well listed in **Table 4** will be made and, if successfully located, each will be visually inspected for integrity. If possible, the total depth of well and the depth to water level in each well will be measured from a reference point on the inner well casing to the nearest 0.01-feet using a clean electronic water level monitoring meter. The depth of well measurements will be compared to readily available construction details. Water level measurements will be used to develop a potentiometric surface map of the water table aquifer at the Site.

4.1.2.2 Monitoring Well Installation and Groundwater Sampling

New and existing monitoring wells will be used to collect groundwater COPC data. Selected monitoring wells will be used for sampling for 1,4-dioxane and PFAS. Monitoring wells will be constructed of 2-inch ID, flush joint, Schedule 40 PVC, with 0.010-inch slotted screen a maximum of 10 feet in length, following the methods described in the QAPP. The newly installed monitoring wells will be developed no sooner than twenty-four (24) hours after construction has been completed. Measurement of the water volume removed and water quality parameters including temperature, pH, conductivity, and turbidity will be recorded at regular intervals throughout the development process.

Groundwater samples will be collected using low flow sampling techniques. Efforts will be made to reduce sample turbidity to the extent practical as determined by the field sampler. Once purging is complete, water quality parameters (i.e., temperature, specific conductance, dissolved oxygen, oxidation-reduction potential and turbidity) will be measured using a calibrated water quality meter. Groundwater samples will then be obtained by directly filling clean, laboratory-provided sampling containers directly from the discharge tubing. Sample labeling, handling, and packing procedures described in the QAPP/FSP will be followed. Groundwater samples will be analyzed for the COPCs described in **Section 3.2.3**.

If observed during water level measurement or groundwater sampling, LNAPL will be measured, if possible, and sampled. Procedures described in the QAPP/FSP will be followed. Samples will be analyzed for VOCs and SVOCs.

Selected monitoring wells will be analyzed for 1,4-dioxane and PFAS as described in **Section 3.2.3**. Sampling will be conducted in a manner consistent with the request for sampling of 1,4-dioxane and PFAS from NYSDEC dated 16 May 2018, and its attached guidance dated April 2018 (**Appendix C**).

4.1.3 Investigation-Derived Material (IDM) Management

Solid IDM that will be generated may include disposable personal protection equipment (PPE), disposable sampling equipment, and excavated material. Liquid IDM that will be generated will consist of purged groundwater from sampling of monitoring wells and water generated during decontamination of field equipment. Solid and liquid IDM will be stored in on-site fifty-five (55)

gallon drums for waste characterization (if necessary) and appropriate off-Site disposal in accordance with the QAPP/FSP.

Laboratory analytical data from drummed samples or a composite sample of the drummed material will be used to characterize the soil and liquid IDM. The contents of each drum will be known based on the date that it was filled and the samples collected on that date. Soils with total PCB concentrations greater than or equal to fifty (50) mg/kg will be classified as hazardous waste containing PCBs as defined in 6 NYCRR Part 371.4 (e). These drums will be shipped for off-Site disposal at an appropriate treatment, storage and/or disposal facility. Each shipment will have the required manifest, labeling and placarding in accordance with Federal and state laws and regulations. Soils with total PCB concentrations less than fifty (50) mg/kg will be managed as nonhazardous waste and transported off-Site for disposal at an appropriate disposal facility.

4.2 QA / QC Protocols

Sample handling, including sample custody and sample control, will be conducted in accordance with the QAPP/FSP and for 1,4-dioxane and PFAS will be consistent with the request for sampling of 1,4-dioxane and PFAS from NYSDEC dated 16 May 2018, and its attached guidance dated April 2018. Quality control samples, including field duplicates, matrix spike/matrix spike duplicates, trip blanks, and equipment blanks, will be collected at the frequency specified in the QAPP/FSP.

4.2.1 Analytical Methods and Laboratory

The analytical laboratories selected for this project will be the TestAmerica Pittsburgh Laboratory for soil and groundwater samples. The laboratory is certified by New York State through the National Environmental Laboratory Accreditation Program (NELAP) for all analytical methods required for the project. Laboratory analytical methods used to analyze field samples will include the following analyses:

- Target Compound List (TCL) VOCs – SW-846 method 8260C (solid and water) including 10 VOC of highest concentration tentatively identified compounds (TICs);
- TCL Semi-Volatile Organic Compounds (SVOCs) – SW-846 method 8270D (solid and water) including 20 highest concentration TICs;
- Polychlorinated Biphenyls (PCBs) – SW-846 method 8082A for solid samples and Low-Level 8082A for water samples;
- Target Analyte List (TAL) Metals – SW-846 methods 6010C/7471B (solid and water);
- PFAS – Modified SW-846 method 537 (soil and water); and
- 1,4-Dioxane – SW-846 method 8270C (soil and water).

4.2.2 Data Submittal

Analytical data will be submitted in complete NYSDEC Analytical Services Protocol data packages. Procedures for chain-of-custody, laboratory instrumentation calibration, laboratory analyses, reporting of data, internal quality control, and corrective actions will be followed as per SW-846 and the laboratory's Quality Assurance Plan. Reviewed data will be imported into an electronic relational database (e.g., Microsoft Access). Analytical data will be submitted with the monthly progress reports in accordance with the BCA. Analytical data will be submitted electronically in accordance with DER-10.

4.2.3 Data Usability Summary Report

Data validation will be completed in accordance with DER-10. Analytical data packages will be reviewed for completeness, field and laboratory QC sample results will be evaluated; significant laboratory control problems will be assessed, and data qualifiers will be assigned. Data validation will be performed on analytical data generated during the Remedial Investigation to verify and validate the usability of those data. Stage 4 validation will be performed on approximately five per cent (5%) of soil samples and one hundred percent (100%) of groundwater samples. Stage 2A validation will be performed on those remaining soil samples. Verification and validation will be based on completeness and compliance checks of sample receipt conditions, both sample-related and instrument-related QC results, recalculation checks, and review of actual instrument outputs. All data will be evaluated for suitability for their intended use, except as noted in the validation reports. Analytical data will be validated within 90 days of receipt from the laboratory.

5 HEALTH AND SAFETY PROTOCOLS

The Site-Specific HASP is provided in **Appendix H**. All Site activities will be performed in such a manner as to ensure the safety and health of all personnel and the surrounding community. All Site activities shall be conducted in accordance with all pertinent general industry (29 CFR 1910) and construction (29 CFR 1926) Occupational Health and Safety Administration (OSHA) standards, as well as any other applicable New York State and municipal codes or ordinances. All Site activities will comply with those requirements set forth in OSHA's final rule entitled Hazardous Waste Operation and Emergency Response (HAZWOPER), 29 CFR 1910.120, Subpart H. Entry into a former oil skimmer on STCC property and other storm water structures will be evaluated for confined space entry requirements in accordance with 29 CFR 1910.146.

To ensure that all Site activities are in compliance, each contractor will prepare a Health and Safety Plan (HASP) in accordance with the aforementioned regulations. The HASP shall conform to the requirements of 29 CFR 1910.120 and all applicable state, federal, local, and other health and safety requirements and safe construction practices not specifically identified in these requirements.

5.1 Community Air Monitoring

NYSDOH's Generic Community Air Monitoring Plan (CAMP) will be implemented during site characterization activities to monitor airborne emissions. Initial air monitoring data for each activity will be used to evaluate the need for continued monitoring. The CAMP will be implemented at the start of each new ground intrusive activity to establish an air monitoring database. When work areas are within twenty (20) feet of playgrounds, athletic playing fields, schools and childcare centers, the continuous monitoring locations for particulates will reflect the nearest potentially exposed individuals. The use of engineering controls such as dust barriers will be considered to prevent exposures related to the work activities and to control dust and odors. Consideration will be given to implementing the planned activities when the presence of potentially exposed populations is at a minimum (i.e., during hours when children are not likely to be present). Common-sense measures to keep dust and odors at a minimum around the work areas will also be implemented to ensure that the children are protected at all times. A copy of the CAMP is included at **Appendix I**.

6 CITIZEN PARTICIPATION ACTIVITIES

In accordance with NYSDEC's BCP guidance, a CPP has been prepared (**Appendix J**).

7 REPORTING

7.1 Interim Reporting

The findings of the assessment of i) Site records regarding Remington Rand Plant decommissioning and demolition and inactive sanitary sewers (**Section 3.2.1**) and ii) EHS building footprint, exterior and immediate surroundings (**Section 3.2.2**) will be reported in a technical memorandum. The technical memorandum will include feasible subsequent RI steps, if any, related to Remington Rand Plant decommissioning and demolition and EHS building footprint.

The findings from the first round of groundwater sampling will be reported in a technical memorandum with work plan amendment as reported findings may result in proposed additional RI activities that will require NYSDEC approval.

7.2 RI Report

An RI Report will be prepared in accordance with DER-10 Section 3.14. Site-related data, including from IRMs, will be presented and evaluated together in an RI Report to give a comprehensive assessment of the Site. In addition to the required elements, the RI report is expected to include the following:

- Summary of field work conducted as part of implementation of this RI Work Plan;
- Data collected, with summary data tables;
- Soil boring and well construction logs;
- Analytical results;
- Photographs;
- Maps;
- Summary of results of separate contemporaneous investigations.

8 SCHEDULE

Table 6 presents the planned schedule for the RI, detailing specific RI tasks and deliverables. The starting date anticipates NYSDEC approval of the RI Work Plan in June 2019. The field work implementation is planned to occur starting in early July and continuing, with pauses, through October 2019. Field work is anticipated to begin with monitoring well installation and groundwater monitoring well sampling in early July. Soil sampling and groundwater sampling from temporary wells is planned to occur in the second half of July and continue in August, starting in the northern part of the Site and proceeding generally southward. The soil sampling and groundwater sampling from temporary wells will conclude with locations east of the gymnasium in September at locations that will not be accessible until then due to IRM#3 activities. Sewer inspection and evaluation field work is planned to occur over an approximate two-week period in September. A contingency soil sampling event, if needed, will follow the sewer inspection, and is anticipated to be in October. A second round of groundwater sampling is planned to occur in October. Laboratory analytical receipt from October sampling is planned to be available by the end of October 2019. Reporting is planned to occur by February 2020.

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TABLES

TABLE 1
AOCs Identified by NYSDEC

Former Sperry Remington Site – North Portion
Elmira, Chemung County, New York

Area of Concern	Description	NYSDEC Characterization	Prior Investigation (Prior to Site Characterization)
AOC-1A	Contaminated Sub-Slab Vapors	• Delineation of Extent • Preferential Pathways o Utilities o Storm / Sanitary Sewer o Steam Tunnels	2010 DOH Health Consultation 2011 2013 EMP Annual Reports
AOC-1B	Indoor Air Quality	• Delineation of Extent • Monitoring • Engineering Controls o HVAC o Sub-Slab Depressurization o Slab Integrity	1952 DOH Sampling Report 1967 Lancy Report and Figures 1977-79 SHS Construction and Demolition Plans 1977 Empire Soils Report 2009 EMP 2010 DOH Health Consultation 2011 2013 EMP Annual Reports 2013 IA Sampling
AOC-2	Pre-1979 Combined Industrial/Storm Sewer	• Structure / Integrity / Contents / Release • Extent • Collection of Surface & Subsurface Contaminants	2013 IRM PDI
AOC-2A	18” Clay Pipe at SE Property Corner	Structure / Integrity / Contents / Release o Extent	2001 Sampling Report 2003 Health Consultation 2009 EMP
AOC-2B	Drywell at SE Property Corner	Structure / Integrity / Contents / Release o Extent	2001 Sampling Report 2003 Health Consultation 2009 EMP
AOC-2C	Drywell Near Building 49	Structure / Integrity / Contents / Release o Extent	2001 Sampling Report 2003 Health Consultation 2009 EMP
AOC-2D	Manhole SW-73 Near Building 28A	Structure / Integrity / Contents / Release o Extent	1952 DOH Waste Sampling 2001 Sampling Report 2003 Health Consultation 2009 EMP

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AOCs Identified by NYSDEC

Former Sperry Remington Site – North Portion
Elmira, Chemung County, New York

Area of Concern	Description	NYSDEC Characterization	Prior Investigation (Prior to Site Characterization)
AOC-2E	Waste Pit near Building 44	Structure / Integrity / Contents / Release o Extent	1967 Lancy Report &Figures 1958 DOH Industrial Outfall Report 1977-79 SHS Construction and Demolition Plans Sanborns Fire Insurance Maps Oil House 1994 Miller Pond Spill #94-166682001 Sampling Report 2003 Health Consultation 2009 EMP 2010 ACR 2013 IRM PDI
AOC-3	1979 Storm Sewer	Structure / Integrity / Contents / Release Collection of Surface & Subsurface Contaminants	2013 IRM PDI Data Report
AOC-3A	1979 Drywell Field	Structure / Integrity / Contents / Release Collection of Surface & Subsurface Contaminants	1977-79 SHS Construction and Demolition Plans 2001 Sampling Report 2003 Health Consultation 2009 EMP
AOC-4	Earthen Waste Pits near EHS Gym and Pool	Structure / Integrity / Contents / Release Connection to Pre-1979 Combined Sewer Contaminated Soil Vapor	2001 Sampling Report 2003 Health Consultation 2004 IIWA GW Investigation 2009 EMP 2010 ACR
AOC-5	Sludge Tanks/Beds/Brick Pits near Building 64	Structure / Integrity / Contents / Release Connection to Pre-1979 Combined Sewer Contaminated Soil Vapor	2009 Indoor Air/Sub-slab Vapor Investigation 2013 IA Sampling No soil or groundwater investigation

TABLE 1
AOCs Identified by NYSDEC

Former Sperry Remington Site – North Portion
Elmira, Chemung County, New York

Area of Concern	Description	NYSDEC Characterization	Prior Investigation (Prior to Site Characterization)
AOC-6	Concrete Vaults	Structure / Integrity / Contents / Release Connection to Pre-1979 Combined Sewer Contaminated Soil Vapor	1967 Lancy Report and Figures 1977-79 SHS Construction and Demolition Plans 1977 Empire Soils Report 1994 Miller Pond Spill #94-16668 2009 EMP
AOC-7	Drywell Structures	Structure / Integrity / Contents / Release	1977-79 SHS Construction and Demolition Plans 2001 Sampling Report 2003 Health Consultation 2009 EMP
AOC-8	Westinghouse Transformer Spill near Building 28A	Nature & Extent of Release(s) PCB Contaminated Soils at locations B15 & FB7 Other PCB Containing Equipment During Westinghouse Site Operation	1975 DEC Spill Report 1975 Chemung Co. HD Spill Report 2001 Sampling Report 2003 Health Consultation 2009 EMP
AOC-9	Oil Storage and Handling Oil House Waste Oil Storage Quench Oil Reservoir	Structure / Integrity / Contents / Release Connection to Pre-1979 Combined Sewer .	Sanborn Fire Insurance Maps 1967 Lancy Report and Figures 1977 Empire Soils Report 1994 Miller Pond Spill #94-16668 2001 Sampling Report 2003 Health Consultation 2009 EMP
			2010 DOH Health Consultation 2011 2013 EMP Annual Reports

TABLE 1
AOCs Identified by NYSDEC

Former Sperry Remington Site – North Portion
Elmira, Chemung County, New York

Area of Concern	Description	NYSDEC Characterization	Prior Investigation (Prior to Site Characterization)
AOC-10	Contaminated Subsurface Soils	Nature & Extent Delineation o PCBs at Locations B3, FB7 & B15 o VOCs at Location FB5 o Metals at Locations B24, B35, SS14, B42, B43 & B52 o SVOCs at Location FB6 o Oil Contaminated Soils at 1977 Empire Report Locations	1977 Empire Soils Report 2001 Sampling Report 2003 Health Consultation 2009 EMP
AOC-11	VOC- and Petroleum-Impacted Groundwater	Nature & Extent Delineation o Potential Soil / Structure Sources	1977-79 SHS Construction and Demolition Plans 1977 Empire Soils Report 1994 Miller Pond Spill #94-16668 1998 Spills EA Report 2004 IIWA GW Investigation 2009 EMP 2010-11 ACR
AOC-11A	Measured Oil Product at MW8-10 and MW-32	Extent Delineation Potential Soil / Structure Sources	1998 Spills EA Report 2004 IIWA GW Investigation 2009 EMP 2010-11 ACR
AOC-11B	PCBs at MW-41	Extent Delineation Potential Soil / Structure Sources	2001 Sampling Report 2003 Health Consultation 2008 Spills GW Sampling 2009 EMP

TABLE 1
AOCs Identified by NYSDEC

Former Sperry Remington Site – North Portion
Elmira, Chemung County, New York

Area of Concern	Description	NYSDEC Characterization	Prior Investigation (Prior to Site Characterization)
AOC-12	Plating, Heat Treatment and Tumbling Areas	Different Locations Over Period of Operation • Spill Collection & Storage Pits, Sumps, Tanks • Material/Chemical Storage & Waste Discharge Extent Delineation Potential Soil / Structure Sources	2001 Sampling Report 2003 Health Consultation 2009 EMP 2010 Health Consultation 2011-2013 ACRs
AOC-13	Metals Cleaning, Vapor Degreaser and Solvent Still	Different Locations Over Period of Operation • Spill Collection & Storage Pits, Sumps, Tanks • Material/Chemical Storage & Waste Discharge Characterization Extent Delineation Potential Soil / Structure Sources	2001 Sampling Report 2003 Health Consultation 2009 EMP 2010 Health Consultation 2011-2013 ACRs
AOC-14	Power Washer, Rust Prevention Dip Operation	Different Locations Over Period of Operation Solvent Emulsions • Spill Collection & Storage Pits, Sumps, Tanks • Material/Chemical Storage & Waste Discharge Extent Delineation Potential Soil / Structure Sources	2001 Sampling Report 2003 Health Consultation 2009 EMP

TABLE 1
AOCs Identified by NYSDEC

Former Sperry Remington Site – North Portion
Elmira, Chemung County, New York

Area of Concern	Description	NYSDEC Characterization	Prior Investigation (Prior to Site Characterization)
AOC-15	Wire Pickling Area	Different Locations Over Period of Operation • Spill Collection & Storage Pits, Sumps, Tanks • Material/Chemical Storage & Waste Discharge Extent Delineation Potential Soil / Structure Sources	2001 Sampling Report 2003 Health Consultation 2009 EMP 2010 Health Consultation 2011-2013 ACRs
AOC-16	Machine Shop Area	Different Locations Over Period of Operation • Spill Collection & Storage Pits, Sumps, Tanks • Material/Chemical Storage & Waste Discharge Extent Delineation Potential Soil / Structure Sources	2001 Sampling Report 2003 Health Consultation 2009 EMP 2010 Health Consultation 2011-2013 ACRs
AOC-17	Possible Disposal Areas	Extent Delineation Potential Soil Sources	Sanborn Fire Insurance Maps 1967 Lancy Report and Figures 1988 PSA 2001 Sampling Report 2003 Health Consultation 2009 EMP 2010 Health Consultation 2011-2013 ACRs

References

1952 DOH Waste Sampling: Examination of Samples from Catchment Area, Remington Rand, Inc. Chemung County, New York
1958 DOH Industrial Outfall: Industrial Survey, Chemung River, New York State Department of Health-Water Pollution Control Section
1967 Lancy Report: Final Engineering Report and Description of Proposed Waste Treatment Installation, former Sperry Remington Facility, Elmira, New York
1977 Empire Soils Investigations, Inc., 1977 Soils and Foundation Study, Southside Recreation and Education Facility, Elmira, New York

TABLE 1
AOCs Identified by NYSDEC

Former Sperry Remington Site – North Portion
Elmira, Chemung County, New York

1977-79 SHS Construction and Demolition Plans: Fanning-Howey Associates, Inc., City School District of Elmira, New York
1988 PSA: Dames & Moore, 1988, Preliminary Site Assessment, Remington Rand Plant, City of Elmira, Chemung County, New York
1998 Spills EA Report: Subsurface Environmental Assessment Report, 777 South Main Street to Parkside Drive, Elmira, New York, NYSDEC Spill #94-16668
2001 Sampling Report: May – October 2000 NYSDEC Sampling report, Southside High School and Adjacent Properties
2003 Health Consultation: Health Consultation, Southside high School in the City of Elmira, Chemung County
2004 IIWA GW Investigation: IIWA Report on Groundwater Chlorinated Solvent Investigation, Southside High School and Adjacent properties
2009 EMP: Environmental Management Plan, Elmira City School District, Southside High School
2010 Health Consultation: Evaluation of exposure related to soil vapor intrusion mitigation verification, Southside High School
2010 ACR: 2010 Annual Certification Report
2011 ACR: 2011Annual Certification Report
2011 RI Phase I: Remedial Investigation Phase 1 Data Report, Former Sperry Remington Facility, Industrial Outfall Site, Elmira, New York, NYSDEC SITE I.D. # 808043
2012 ACR: 2012 Annual Certification Report. report.hw808022.2013-04-25.EHS_2012 Annual Certification
2013 IRM PDI: Interim Remedial Measure Pre-Design Investigation Data Report, Former Sperry Remington Site (NYSDEC Site I.D. #808043), City of Elmira, Chemung County, NY
2013 RI Phase II Report: Former Sperry Remington Site (NYSDEC Site I.D. #808043), Remedial Investigation Phase 2 Data Report, City of Elmira, Chemung County, NY
2013 IA Sampling: HVAC Evaluation Findings, Southside High School Room 127, Elmira, New York

TABLE 2
Soil Investigation Sampling Plan
Former Sperry Remington - North Portion
Elmira, Chemung County, New York

Primary Sample Locations	Surface Condition	Sampling Interval									Notes
		Shallow 1 0 to 0.17 ft bgs	Shallow 2 0.17 to 2 ft bgs	Shallow 3 bottom of sub-base fill to 2 ft bgs	Sub 1 2 to 4 ft bgs	Sub 2 4 to 6 ft bgs	Sub 3 6 to 8 ft bgs	Sub 4 8 to 10 ft bgs	Sub 5 10 to 12 ft bgs	Sub 6 12 to 14 ft bgs	
SSHS-B3000	turf		V		M	M	M	M	M	V, M	B364 within 30 ft, sampled from 0 to 2 ft for P; B731 within 30 ft, sampled from 0 to 0.17 ft for P; B493 within 30 ft, sampled from sampled from 0 to 2 ft for P; B517 within 30 ft, sampled from 0 to 2 ft for P, M and S and from 2 to 14 ft for P; B302 within 30 ft, sampled from 0 to 8 ft for P; B732 within 30 ft, sampled from 0 to 0.17 ft for P; B601 within 30 ft, sampled from 0 to 0.17 ft for P; B354 within 30 ft, sampled from 0 to 4 ft for P;
SSHS-B3001	turf		V, S, M		P, M					P, V, M	B604 within 30 ft , sampled from 0 to 0.17 ft for P; B28 within 30 ft, sampled from 0 to 0.25 ft for P, V, S, M and from 4 to 12 for P, S, V, M; B488 within 30 ft, sampled from 0 to 2 ft for P; B489 within 30 ft, sampled from 0 to 2 ft for P.
SSHS-B3002	turf	S, M	V, S, M		M	M	M	P, M	P, M	P, V, M	B1S-A within 30 ft, sampled from 0 to 0.17 ft for P; B300 within 30 ft, sampled from 0 to 8 ft for P.
SSHS-B3003	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	B1032 within 30 ft, sampled from 0 to 2 ft for P and M; B1030 within 30 ft, sampled from 0 to 2 ft for P and M; B1066 within 30 ft, sampled from 0 to 2 ft for P; B1029 within 30 ft, sampled from 0 to 2 ft for P and M; B1031 within 30 ft, sampled from 0 to 2 ft for P and M; B1028 within 30 ft, sampled from 0 to 2 ft for P and M;
SSHS-B3004	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3005	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3006	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3007	turf				P, M	P, M	P, M	P, M	P, M	P, V, M	B58 within 30 ft, sampled from 0-0 ft bgs and from 0.5 to 2.5 ft bgs for P, V, S, M.
SSHS-B3008	turf				P, M	P, M	P, M	P, M	P, M	P, V, M	B57 within 30 ft, sampled from 0-0 ft bgs and from 0.5 to 2.5 ft bgs for P, V, S, M.
SSHS-B3009	turf				P, M	P, M	P, M	P, M	P, M	P, V, M	B56 within 30 ft, sampled from 0-0 ft bgs and from 0.5 to 2.5 ft bgs for P, V, S, M.
SSHS-B3010	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3011	turf				P, M	P, M	P, M	P, M	P, M	P, V, M	B55 within 30 ft, sampled from 0-0 ft bgs and from 0.5 to 2.5 ft bgs for P, V, S, M.
SSHS-B3012	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3013	turf				P, M	P, M	P, M	P, M	P, M	P, V, M	B48 within 30 ft, sampled from 0-0 ft bgs and from 0.5 to 2.5 ft bgs for P, V, S, M.
SSHS-B3014	turf				P, M		P, M	P, M	P, M	P, V, M	B50 within 30 ft, sampled from 0-0 ft bgs, from 0.5 to 2.5 ft bgs and from 4 to 7 ft bgs for P, V, S, M.
SSHS-B3015	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3016	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3017	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3018	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3019	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3020	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3021	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3022	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3023	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3024	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3025	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3026	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3027	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3028	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3029	turf		P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	SS3 within 30 ft, sampled from 0 to 0.25 ft bgs for P, V, S, M.
SSHS-B3030	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3031	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3032	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3033	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3034	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3035	turf				P, M	P, M	P, M	P, M	P, M	P, V, M	B45 within 30 ft, sampled from 0-0 ft bgs and from 0.5 to 2.5 ft bgs for P, V, S, M.
SSHS-B3036	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3037	non-turf										B90 within 30 ft, sampled from 0.17 to 15 ft bgs for P, V, S, M.
SSHS-B3038	non-turf				P, S, M	P, M	P, M		P, M	P, V, M	B37 within 30 ft, sampled from 0-0 ft bgs, 0.5 to 2.5 ft bgs and 8 to 10 ft bgs for P, V, S, M.
SSHS-B3039	turf	P, M	P, V, M		P, M	P, M	P, M	P, M	P, M	P, V, M	B405 within 30 ft, sampled from 0 to 2 ft bgs for S.

TABLE 2
Soil Investigation Sampling Plan
Former Sperry Remington - North Portion
Elmira, Chemung County, New York

Primary Sample Locations	Surface Condition	Sampling Interval									Notes
		Shallow 1 0 to 0.17 ft bgs	Shallow 2 0.17 to 2 ft bgs	Shallow 3 bottom of sub-base fill to 2 ft bgs	Sub 1 2 to 4 ft bgs	Sub 2 4 to 6 ft bgs	Sub 3 6 to 8 ft bgs	Sub 4 8 to 10 ft bgs	Sub 5 10 to 12 ft bgs	Sub 6 12 to 14 ft bgs	
SSHS-B3040	turf	S, M	V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	B589 within 30 ft, sampled from 0 to 2 ft bgs for P.
SSHS-B3041	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3042	turf	P, S, M	P, V, S, M		P, M	P, M	P, M	P, M	P, M	P, V, M	B20 within 30 ft, sampled from 5 to 7 ft bgs for P, V, S, M.
SSHS-B3043	turf	S, M	V, S, M			M	M	P, M	P, M	P, V, M	B502 within 30 ft, sampled from 2 to 4 ft bgs for P; B601 within 30 ft, sampled from 0 to 0.17 ft bgs for P; B351 within 30 ft, sampled from 0 to 4 ft bgs for P; B199A within 30 ft, sampled from 2 to 4 ft bgs for P; B199 within 30 ft, sampled from 0 to 2 ft bgs for P; B602 within 30 ft, sampled from 0 to 0.17 ft bgs for P; B302 within 30 ft, sampled from 0 to 8 ft bgs for P.
SSHS-B3044	non-turf							P, M	P, M	P, V, M	B26 within 30 ft, sampled from 4 to 6 ft bgs for P, V, S, M; B26-A within 30 ft, sampled from 0 to 8 ft bgs and from 13.5 to 15.5 ft bgs for P, V, S, M; B181 within 30 ft, sampled from 0 to 8 ft bgs for P; B179 within 30 ft, sampled from 0 to 8 ft bgs for P; B180 within 30 ft, sampled from 0 to 8 ft bgs for P; B182 within 30 ft, sampled from 0 to 8 ft bgs for P.
SSHS-B3045	turf									P, V, M	B98 within 30 ft, sampled from 0 to 12 ft bgs for P, V, S, M.
SSHS-B3046	turf	S, M	V, S, M		P, V, M	P, V, M	P, V, M	P, V, M	P, V, M	P, V, M	B643 within 30 ft, sampled from 0 to 2 ft bgs for P.
SSHS-B3047	non-turf			P, V, S, M	P, V, S, M	P, V, M	P, V, M	P, V, M	P, V, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3048	non-turf			V, S, M	P, S, M	P, M	P, M	P, M	P, M	P, V, M	B1041 within 30 ft, sampled from 0 to 2 ft bgs for P;
SSHS-B3049	non-turf			V, S, M	P, S, M	P, M	P, M	P, M	P, M	P, V, M	B1037 within 30 ft, sampled from 0 to 2 ft bgs for P;
SSHS-B3050	non-turf			P, V, S, M	P, S, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3051	non-turf			V, M		P, M	P, M	P, M	P, M	P, V, M	B38 within 30 ft, sampled from 0 - 0 ft bgs and from 1 to 4.5 ft bgs for P, V, S, M. B404 within 30 ft, sampled from 0 to 2 ft bgs for S; B398 within 30 ft, sampled from 0 to 2 ft bgs for P;
SSHS-B3052	non-turf				P, S, M	P, M	P, M	P, M	P, M	P, V, M	B36 within 30 ft, sampled from 0 - 0 ft bgs and from 0.5 to 2.5 ft bgs for P, V, S, M.
SSHS-B3053	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	B1031 within 30 ft, sampled from 0 to 2 ft bgs for P and M; B1028 within 30 ft, sampled from 0 to 2 ft bgs for P and M; B1029 within 30 ft, sampled from 0 to 2 ft bgs for P and M.
SSHS-B3054	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3055	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3056	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3057	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3058	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3063	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3064	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3065	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3066	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3067	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3068	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3069	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3070	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3071	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3072	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3073	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3074	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3075	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3076	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3077	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.
SSHS-B3078	turf	S	V, S		P, M	P, M	P, M	P, M	P, M	P, V, M	No previous samples available within 30 ft.

Notes:
M - Metals P - PCBs S - SVOCs V - VOCs
Collection of VOC and SVOC samples will be based on field indications: PID reading > 10 ppm, olfactory evidence, or staining.
ft bgs - feet below ground surface, defined as base of vegetation (turf areas) and base of sub-base fill (non-turf areas)

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

AOC	CSM	Media	COPC	Investigation Rationale
1A	1. An area of VOC-impacted sub-slab vapor underlies portions of the EHS building, posing a potential vapor intrusion (VI) to indoor air risk. 2. Source of VOCs may be related to TCE-impacted soil area north of Room 127.	Vapor	V	1. VI has been assessed (Soil Vapor Intrusion Assessment). 2. Source to be further investigated as described for AOC13 / AOC16.
2	1. Pre-1979 Combined Industrial/Storm Sewer remains in place at the Site. 2. While no specific potential release has been identified, there may be a potential for past release to surface soil from the feature, and there is unknown potential for vertical migration through the soil column to the water table. 3. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. Assess location, depth and alignment of sewer using geophysical survey methods and excavation. 2. Assess condition of catch basins and sewer lines, including presence of laterals, using camera survey. 3. Sample contents of catch basins; sample contents of sewer lines where accessible.
2A/2B	1. 18-in clay pipe, drywell (CB-15) and 5-ft box culvert remain in place at the southeastern corner of the Site. 2. COPCs have been detected in soil at CB-15. 3. There is potential for COPC release from the 18-in clay pipe and 5-ft box culvert to underlying soil. 4. There is unknown potential for vertical migration through the soil column to the water table at CB-15. 5. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil, groundwater (CB-15)	V,S,M,P	1. Assess location, depth and alignment of 18-in clay pipe by excavation. 2. Sample soil at and beneath 18-in clay pipe, CB-15 and 5-ft box culvert. 3. Sample groundwater at CB-15. 4. Steep embankment and NYSEG gas line immediately east of AOC2A/2B do not allow for subsurface intrusive work immediately east of AOC2A/2B.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

2C	1. A former feature identified as a drywell near former Building 49; along an alignment parallel to the Site boundary but not visible by way of surface reconnaissance. 2. There is potential for COPC release from the feature to underlying soil. 3. There is unknown potential for vertical migration through the soil column to the water table at the feature.	Soil	V,S,M,P	1. Assess presence and location of former feature by geophysical survey methods. 2. Assess presence and location (if needed following geophysical survey), depth and conditions of feature by excavation. 3. Sample soil beneath structure if located.
2D	1. Manhole SW-73 was located near Former Building 28A; this area was previously addressed by sampling and remedial actions for IRM #1 (Geosyntec, 2018a) and the FFC PDI. Further remedial actions including sampling are planned for this area in summer 2019 as Phase 1 IRM #3. 2. The water table is at approximately 16 ft bgs at this location and groundwater flow direction is east-northeast.	Soil, groundwater (SSHS-MW15S)	P	1. Collect additional samples during Phase 1 IRM #3 planned for summer 2019. 2. Replace and monitor former monitoring well SSHS-MW15S following IRM #3.
2E	1. Former waste pit underlies the EHS building (**Figure 4**). 2. The water table is at approximately 14 to 16 ft bgs at this location and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. Investigate following the supplemental soil sampling program for potential sampling locations beneath the EHS building.
3	1. 1979 storm sewer (**Figure 4**). 2. Pre-RI work, including FFC RI/PDI, has assessed location, orientation and depth of sewer. 3. Catch basins at the FFC have been assessed and sampled where material was present as part of the FFC RI/ IRM#3 PDI. 4. Potential release of COPCs in soil to catch basins at FFC is being assessed in the FFC IRM#3 PDI.	Soil	S,M,P	1. Sample soil beneath catch basins as indicated by results of FFC catch-basin sampling (**Figure 5**).

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

3A	1. Eight (8) discrete areas characterized by NYSDEC as drywell fields. 2. One (1) small area near the tennis courts was characterized by sampling associated with IRM #1. 3. The structures have the potential to have resulted in release of COPCs to underlying soil, and there is unknown potential for vertical migration through the soil column to the water table. 4. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. As no specific potential COPC release points are indicated by current data and information, sample locations are laterally spatially distributed and informed by pre-RI data as indicated on **Figures 10A, B, C, D, F and 11B**. 2. Planned sampling is from surface soil to water table to characterize potential vertical migration from potential past release. 3. Based on results, sample as indicated by the sampling decision flow chart.
4	1. Earthen waste pits near EHS gymnasium and pool. 2. Former structure elevations of the feature were from approximately 852 to 857 feet msl. 3. The feature has the potential to have resulted in release of COPCs to underlying soil, and there is unknown potential for vertical migration through the soil column to the water table. 4. The water table is at approximately 14 ft bgs and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. Sample soil at and below the approximate depth of the former structure. 2. Based on results, sample as indicated by the sampling decision flow chart.
5	1. The feature, sludge tanks/beds/brick pits near Building 64, underlies the EHS building (**Figure 4**). 2. The water table is at approximately 14 ft bgs and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. Investigate following the supplemental soil sampling program for potential sampling locations beneath the EHS building.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

6	1. Discrete areas were characterized by NYSDEC as former concrete vaults located north of the EHS building and one discrete area straddling the southwestern Site boundary (**Figure 4**). The area north of the EHS building has been characterized by the RI of the FFC and PDI activities for IRM #3. Two other discrete areas identified as part of AOC6 lie off Site to the south and as such are not included in the RI for this Site. 2. The structures have the potential to have resulted in release of COPCs to underlying soil, and there is unknown potential for vertical migration through the soil column to the water table. 3. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. At FFC, additional sampling is planned during implementation of IRM #3. 2. At southwestern portion of Site, sample soil at depths corresponding to elevations of the former feature and below. 3. Based on results, sample as indicated by the sampling decision flow chart.
7	1. The feature, drywell structures, underlie the EHS building (**Figure 4**). 2. The water table is at approximately 14 to 16 ft bgs and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. Investigate following the supplemental soil sampling program for potential sampling locations beneath the EHS building.
8	1. Former Westinghouse PCB release (**Figure 4**). 2. This area has been characterized by the RI of the FFC and PDI activities for IRM #3 and through sampling and remedial actions for IRM #1 (Geosyntec, 2018a).	Soil	V,S,M,P	1. Additional sampling planned during Phase 1 FFC IRM planned for summer 2019 and during implementation of IRM#3. 2. Based on results, sample as indicated by the sampling decision flow chart.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

9	1. Two discrete areas characterized as former oil houses, the larger of which is located on the eastern edge of the Site, the smaller in the southwest part of the Site (**Figure 4**). 2. The area on the eastern edge of the Site has been characterized by the RI of the FFC and PDI activities for IRM #3. The smaller area in the southwest part of the Site entirely underlies the EHS building. 3. The structures have the potential to have resulted in release of COPCs to underlying soil, and there is unknown potential for vertical migration through the soil column to the water table. 4. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. Investigate the area beneath the EHS building following the supplemental soil sampling program for potential sampling locations beneath the EHS building. 2. Investigate the area at the FFC in additional sampling during implementation of IRM#3. 3. Based on results, sample as indicated by the sampling decision flow chart.
10A	1. Pre-RI results indicated metals in soil at B43, B42, B52, B24 and B35.	Soil	M	1. Soil sampling to delineate metals in the area of B43, B42 and B52. 2. Remedial actions for IRM #2 removed metals in the area of B24 and B35. 3. Based on results, sample as indicated by the sampling decision flow chart.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

10B	1. Pre-RI results indicated PCBs in soil at B3, FB7 and B15. 2. Pre-RI results indicated VOCs in soil at FB5. 3. Pre-RI results indicated SVOCs at FB6. 4. Pre-RI results indicated PCBs in soil at B15.	Soil	P,V,S	1. Additional sampling planned during Phase 1 FFC IRM planned for summer 2019 and during implementation of IRM#3 to delineate PCBs in the area of B3 and FB7, VOCs in soil in the area of FB5 and SVOCs in soil in the area of FB6. 2. Remedial actions for IRM# 1 characterized PCBs in soil in the area of B15. 3. Based on results, sample as indicated by the sampling decision flow chart.
10C	1. Pre-RI results indicated petroleum impacts in areas at the FFC. 2. The water table is at approximately 14 ft bgs at the FFC and groundwater flow direction is east-northeast. 3. A sheen was observed at the water table during groundwater sampling in previous investigations (Geosyntec, 2017). A review of groundwater data indicates the absence of COPCs above TOGS at locations where a sheen was observed (MW-10, MW-13, MW-33, MW-11S). The sheen indicates potential VOC, SVOC or DRO impacts to groundwater.	Soil, Groundwater	V,S,DRO	1. Results for the RI of the FFC and PDI activities for IRM #3 will be used to delineate areas of petroleum impacts. 2. Existing monitoring wells will be used to sample groundwater and monitor water levels.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

10D	1. Previous investigation of the EHS building footprint (Empire, 1977) encountered oil-impacted soil. 2. Two areas characterized by NYSDEC as oil in shallow soils underlie the EHS Building. 3. Previously collected SVOC data for B26 and B29-A characterize shallow soil east of the EHS Building. 4. Three areas characterized as oil in deep soils mostly underlie the EHS building.	Soil, Groundwater	V,S,DRO	1. Sampling at six (6) soil borings at and downgradient from areas of oil-impacted soil, east of the gymnasium (**Figure 8**). These samples will be collected at and below the water table to evaluate the smear zone and will be analyzed for VOCs, SVOCs and DRO. 2. Based on results, sample as indicated by the sampling decision flow chart. 3. Using existing monitoring wells, sample groundwater and monitor water levels downgradient (east northeast) of observed oil impacts beneath the EHS building.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

11	1. Pre-RI results indicated areas where groundwater is impacted by measurable oil product, also known as light nonaqueous phase liquid (LNAPL); a sheen, which may be an indication of petroleum impact, has been observed at MW-11S. 2. Pre-RI results indicated VOC-impacted groundwater at MW-8 and MW-30. 3. Pre-RI results indicated petroleum-impacted groundwater at MW-8, MW-10, MW-32, MW-34, and MW-41. 4. Pre-RI results indicated PCB impacts at MW-8 , MW-15S and MW-41. 5. The lateral and vertical extent of the impacts listed above have not been fully characterized.	Groundwater	V,S,P	1. The lateral and vertical extent of impacts at the FFC, including the sheen observed at 11-S, is being investigated as part of the IRM #3 PDI. 2. Assess results of soil sampling at locations upgradient from the groundwater impacted area to identify potential sources of groundwater impacts. 3. Replace MW-15S following Phase 1 IRM#3 activities and use it to sample groundwater and monitor water levels. 4. Use existing and new groundwater monitoring wells, and temporary wells, to sample groundwater and monitor water levels to investigate the fate and transport of COPCs in groundwater at and downgradient of potential source areas and impacted areas. 5. Sample groundwater samples from temporary wells situated laterally downgradient and vertically from monitoring wells with TOGS exceedances. 6. Based on results, sample as indicated by the sampling decision flow chart.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

12	1. Former location of plating, heat treatment and tumbling areas on the southwestern side of the Site (**Figure 4**) and at former Buildings 49 and 67E on the eastern side of the Site (**Figure 4**). 2. Partly underlies the EHS building but mostly lies outside to the west of the building and is overlapped by AOC16 and AOC17. The location of AOC12 on the eastern side of the Site is overlapped by AOC16 and AOC17.	Soil	V,S,M,P	1. As it is overlapped by AOCs 16 and 17, AOC12 is addressed by sampling of those AOCs.
13	1. Former location of metal cleaning, vapor degreaser and solvent still areas. 2. Partly underlies the EHS building but mostly lies outside to the north of the building, and is overlapped by AOC16 and AOC17.	Soil	V,S,M,P	1. As it is overlapped by AOCs 16 and 17, AOC13 is addressed by sampling of those AOCs.
14	1. Four (4) discrete areas including the former paint shop and two (2) on-Site and one (1) off-Site (to the south) areas characterized as being connected to the former tumbling sludge settling pond (**Figure 4**). 2. The northernmost area underlies the area where remedial actions were conducted for IRM #1 and no further sampling is needed at that location. 3. The other two (2) on-Site areas will be addressed by sampling for SVOCs and metals (**Figure 4**), as these locations have been previously sampled for PCBs. 4. The structures have the potential to have resulted in release of COPCs to underlying soil, and there is unknown potential for vertical migration through the soil column to the water table. 5. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil	S,M	1. Soil sampling for SVOCs and metals. 2. Based on results, sample as indicated by the sampling decision flow chart.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

15	1. Two discrete former wire pickling areas, one of which is off Site to the south, and not part of the RI (**Figure 4)**. 2. The on-Site part of AOC15 partly underlies the EHS building but extends outside of the EHS building to the east. Seven (7) locations have been sampled in this area previously for PCBs and no further sampling for PCBs is needed. 3. The structures have the potential to have resulted in release of COPCs to underlying soil, and there is unknown potential for vertical migration through the soil column to the water table. 4. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil	S,M	1. Soil sampling for SVOCs and metals. 2. Based on results, sample as indicated by the sampling decision flow chart.
16, North	1. Former machine shop areas, with four discrete areas on Site (**Figure 4**). 2. The northern portion of AOC16 is coincident with and slightly larger than a possible plating area portion of AOC17. While the location of former machine shop and plating areas is known based on historic records, there are no records regarding the decommissioning and demolition of the former buildings at this location. 3. Two discrete areas of AOC16 are at the FFC (**Figure 4**). 4. While no specific potential release has been identified, there may be a potential for past release to surface soil due to former industrial land use, and there is unknown potential for vertical migration through the soil column to the water table. 5. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. As no specific potential COPC release points are indicated by current data and information, sample locations are laterally spatially distributed across previously unsampled areas. 2. Planned sampling is from surface soil to water table to characterize potential vertical migration from potential past release. 3. Based on results, sample as indicated by the sampling decision flow chart. 4. For that portion of AOC16 at the FFC, additional sampling planned during Phase 1 FFC IRM planned for summer 2019 and during implementation of IRM#3.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

16, West	1. Former machine shop areas, with four discrete areas on Site (Figure 4). 2. A significant part of AOC16 on the western side of the Site (Figure 4) has been addressed by the SC (Geosyntec, 2018a). Figure 4 illustrates the area of AOC16 excavated and replaced with clean fill during IRM #1. PCB-impacted soil documented along the former haul road used during IRM#1 were located on the northern end of the tennis courts (Figure 11B). This soil has the potential to impact groundwater. 3. While no specific potential release has been identified, there may be a potential for past release to surface soil due to former industrial land use, and there is unknown potential for vertical migration through the soil column to the water table. 4. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast.	Groundwater	M, P	1. Sample groundwater from two (2) temporary wells for PCBs to investigate potential impacts to groundwater along the former haul road used during IRM#1; one location upgradient and one downgradient from PCB-impacted soil locations (**Figure 11B**). Because groundwater has not been characterized in this area, analyze for TAL metals in addition to PCBs. 2. Based on results, sample as indicated by the sampling decision flow chart.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

TCE Investi-gation Area	1. One (1) AOC16 area on the southwestern part of the Site partly underlies the EHS Building, but mostly lies outside to the west and north of the building in an area coincident with AOC12, AOC13 and AOC17. This is the area where TCE was detected by ECSD contractors in grab soil samples at concentrations of up to 10,000 µg/kg during the EHS stormwater sewer installation (**Figure 14**). 2. Unknown potential for vertical migration through the soil column to the water table. 3. The water table is at approximately 16 ft bgs and groundwater flow direction is east-northeast.	Soil, Groundwater	V,E	1. Sample soil at eight (8) locations in this area to further assess the extent of TCE-impacted soil and the potential for migration to groundwater. 2. Planned sampling is from surface soil to water table to characterize potential vertical migration from potential past release. 3. Analyze select soil samples for emerging COPCs. 4. Based on results, sample as indicated by the sampling decision flow chart.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

17	1. Former location of a possible plating area in the northern part of the Site; coincident with AOC16. 2. Four (4) former potential disposal areas, three (3) on the southwestern part of the Site and one (1) on the southeastern part of the Site; two of these areas underlie the EHS Building. 3. Former acid drainage pit in the southeastern part of the Site; underlies the EHS Building. 4. Former coal pile located in the southeastern corner of the Site; excavated during IRM #2. 5. While no specific potential release has been identified in the former disposal area east of the gymnasium (**Figures 7A and 7B**), there may be a potential for past release to surface soil due to former industrial land use, and there is unknown potential for vertical migration through the soil column to the water table. 6. The water table is at approximately 14 ft bgs and groundwater flow direction is east-northeast.	Soil	V,S,M,P	1. Coincident areas with AOC16 are investigated as noted for AOC16. 2. Investigate the area beneath the EHS building following the supplemental soil sampling program for potential sampling locations beneath the EHS building. 3. Sample five (5) locations east of the gymnasium (Figures 7A and 7B) to assess the potential for releases to soil. 4. Planned sampling is from surface soil to water table to characterize potential vertical migration from potential past release. 5. Based on results, sample as indicated by the sampling decision flow chart. 6. Use existing monitoring wells at and downgradient of the AOC17 areas to sample groundwater and monitor water levels.

TABLE 3
Investigation Plan by Area

Former Sperry Remington Site - North Portion
Elmira, Chemung County, New York

Other*	1. "Other areas" are areas with no identified potential release of COPCs to the environment. 2. While no specific potential release has been identified, there may be a potential for past release to surface soil due to former industrial land use, and there is unknown potential for vertical migration through the soil column to the water table. 3. The water table is at approximately 14 to 16 ft bgs (greater on the western part of the Site; shallower on the east) and groundwater flow direction is east-northeast. 4. Subareas of contiguous "other areas" include: A. North side of Site - former steel storage building, former parking area, open space B. North of tennis courts - former parking area, garage, rec hall, cafeteria C. South of building/west of rear parking lot - former landscaped area, former building 66 (storage)	Soil	V,S,M,P, E	1. As no specific potential COPC release points are indicated by current data and information, sample locations are laterally spatially distributed across previously unsampled areas. 2. Planned sampling is from surface soil to water table to characterize potential vertical migration from potential past release. 3. Based on results, sample as indicated by the sampling decision flow chart. 4. Planned sampling is from surface soil to water table to characterize potential vertical migration from potential past release. 5. Based on results, sample as indicated by the sampling decision flow chart.

* "Other" = areas of the Site not identified as an AOC
V - VOCs
S - SVOCs
M - Metals
P - PCBs
E - Emerging COPC

TABLE 4
MONITORING WELLS

Former Sperry Remington - North Portion
Elmira, Chemung County, New York

Well ID	DTB [ft bTOC]	DTW [ft bTOC]	Type	Diameter (inches)
MW-1*	--	--	flush-mount PVC	4
MW-2*	--	--	flush-mount PVC	6
MW-3*	--	--	flush-mount PVC	4
MW-4*	--	--	flush-mount PVC	2
MW-5*	--	--	flush-mount PVC	2
MW-6*	--	--	flush-mount PVC	3/4
MW-7[1]	13.3	>13.3 (Dry)	flush-mount PVC	3/4
MW-8S[1]	17.8	14.51	flush-mount PVC	2
MW-9[1]	20.4	14.86	flush-mount PVC	2
MW-10[1]	20.1	14.63	flush-mount PVC	2
MW-11D[1]	78.1	17.91	flush-mount PVC	2
MW-11S[1]	21.1	16.62	flush-mount PVC	2
MW-12[1]	19.5	15.5	flush-mount PVC	2
MW-13[1]	22.0	15.44	flush-mount PVC	2
MW-15D[1]	76.1	18.12	flush-mount PVC	2
MW-15S[1]	17.8	15.26	flush-mount PVC	2
MW-16[1]	13.8	>13.81	flush-mount PVC	2
MW-17*	--	--	flush-mount PVC	2
MW-22*	--	--	flush-mount PVC	2
MW-30[1]	17.9	15.09	flush-mount PVC	2
MW-31[1]	18.0	14.66	flush-mount PVC	2
MW-32[1]	18.0	14.3	flush-mount PVC	2
MW-33[1]	19.4	15.28	flush-mount PVC	2
MW-34[1]	19.4	15.31	flush-mount PVC	2
MW-36[1]	19.0	16.28	flush-mount PVC	2
MW-37[1]	18.7	15.33	flush-mount PVC	2
MW-38[1]	19.9	16.51	flush-mount PVC	2
MW-39[1]	24.6	14.79	flush-mount PVC	2
MW-40[1]	24.4	16.02	flush-mount PVC	2
MW-41[1]	27.3	20.54	stick-up PVC	2
MW-42[2]	22.3	10.89	flush-mount PVC	2
MW-43[2]	20.0	12.51	flush-mount PVC	2
MW-44[2]	29.7	16.3	flush-mount PVC	2
MW-46[3]	25	12.4	flush-mount PVC	2
MW-47[3]	28	16.41	flush-mount PVC	2

Notes:

Monitoring wells MW28, MW29, MW14, MW6, MW8D, and MWD could not be located during site characterization and are presumed lost and/or abandoned.

--: no data

ft bTOC: feet below top of casing

DTB: depth to bottom

DTW: depth to water

PVC: polyvinyl chloride

TOC: top of inner casing

*Wells will be located and visually inspected for integrity as part of Remedial Investigation.

1. Water level measurements were collected in November 2014 except for wells installed in 2016.

2. Wells MW-42, MW-43 and MW-44 were installed in March 2016. Depth-to-bottom and depth-to-water measurements collected on performed in March 2016.

3. Wells MW-46 and MW-47 were installed in August 2016. Depth-to-bottom measurements were estimated based on well construction logs. Depth-to-water measurements were collected in September 2016.

TABLE 5
Groundwater Investigation Sampling Plan

Former Sperry Remington - North Portion
Elmira, Chemung County, New York

Well ID	Spring 2019						Fall 2019			
	PCBs	VOCs	SVOCs	Metals	1,4-Dioxane	PFAS	PCBs	VOCs	SVOCs	Metals
MW-1	X	X	X	X			Wells with an exceedance in Spring 2019 will be sampled in Fall 2019.			
MW-2	X	X	X	X						
MW-3	X	X	X	X						
MW-4	X	X	X	X						
MW-5	X	X	X	X						
MW-6	X	X	X	X						
MW-7	X	X	X	X						
MW-8S	X	X	X	X						
MW-9	X	X	X	X						
MW-10	X	X	X	X						
MW-11D	X	X	X	X						
MW-11S	X	X	X	X	X	X				
MW-12	X	X	X	X						
MW-13	X	X	X	X						
MW-15S*	X	X	X	X						
MW-16	X	X	X	X						
MW-17	X	X	X	X						
MW-22	X	X	X	X						
MW-30	X	X	X	X	X	X				
MW-31	X	X	X	X						
MW-32	X	X	X	X						
MW-33	X	X	X	X						
MW-34	X	X	X	X						
MW-36	X	X	X	X						
MW-37	X	X	X	X						
MW-38	X	X	X	X						
MW-39	X	X	X	X						
MW-40	X	X	X	X						
MW-41	X	X	X	X						
MW-42	X	X	X	X						
MW-43	X	X	X	X						
MW-44	X	X	X	X						
MW-46	X	X	X	X						
MW-47	X	X	X	X	X	X				
MW-48*	X	X	X	X						
MW-49*	X	X	X	X						
MW-50*	X	X	X	X						
MW-51*	X	X	X	X						
MW-52*	X	X	X	X						
Temporary Well B3079*	X	X	X	X						
Temporary Well B3080*	X	X	X	X						
Temporary Well B3081*	X	X	X	X						
Temporary Well B3082*	X	X	X	X						
Temporary Well B3083*	X	X	X	X						
Temporary Well B3084*	X	X	X	X						
Temporary Well B3085*	X	X	X	X						
Temporary Well B3086*	X	X	X	X						
Temporary Well B3087*	X	X	X	X						
Temporary Well B3088*					X	X				
Temporary Well B3089*					X	X				

Notes:
The groundwater investigation program is subject to change based on the usability of existing monitoring wells for data collection.
* Proposed permanenent/temporary wells to be installed for RI

TABLE 6
Remedial Investigation Schedule

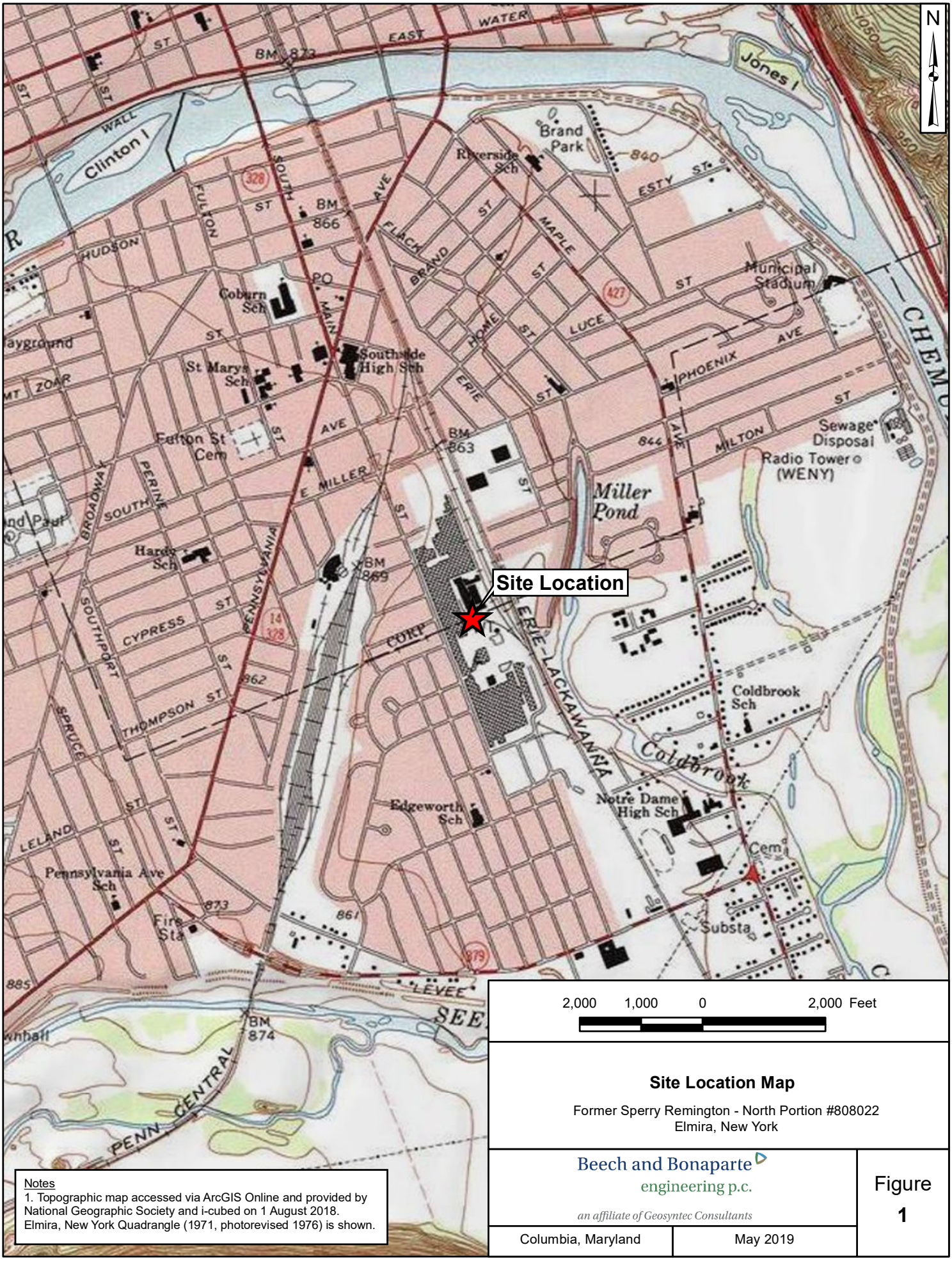
Former Sperry Remington - North Portion
Elmira, Chemung County, New York

Task Name	Duration	Start	Finish
Site-Wide Remedial Investigation	200 days	Wed 5/29/19	Tue 3/3/20
Revised Work Plan Submittal	0 days	Wed 5/29/19	Wed 5/29/19
Work Plan Approval (Tentative)	1 mon	Wed 5/29/19	Tue 6/25/19
Review & Update Access Agreement	6 wks	Wed 5/29/19	Tue 7/9/19
Well Inventory / development	3 wks	Mon 7/8/19	Fri 7/26/19
Monitoring Well Installation / development	1 wk	Mon 7/22/19	Fri 7/26/19
Soil & Temporary Well Sampling	2 wks	Wed 7/10/19	Tue 7/23/19
Sewer Investigation	1 wk	Mon 7/15/19	Tue 7/19/19
Lab Analytical Receipt	2 wks	Thu 7/25/2019	Thu 8/8/19
Mapping & Analysis	2 wks	Mon 8/12/19	Tue 8/27/19
Data validation	1 mon	Fri 8/16/19	Thu 9/26/19
Groundwater Sampling, Event 1	2 wks	Mon 7/29/19	Fri 8/9/19
Lab Analytical Receipt	2 wks	Tue 8/13/19	Mon 8/26/19
Mapping & Analysis	3 wks	Wed 8/28/19	Tue 9/17/19
Data validation	3 wks	Tue 9/3/19	Wed 9/25/19
Soil Sampling, East of Gymnasium[1]	2 wks	Mon 8/12/19	Fri 8/23/19
Sewer Investigation East of Gymnasium	1 wks	Mon 8/12/19	Fri 8/16/19
Lab Analytical Receipt	2 wks	Tue 8/27/19	Tue 9/10/19
Mapping & Analysis	1 wk	Wed 9/11/19	Tue 9/18/19
Data validation	3 wks	Wed 9/11/19	Thu 10/3/19
Groundwater Sampling, Event 2	2 wks	Mon 9/30/19	Fri 10/11/19
Lab Analytical Receipt	2 wks	Mon 10/14/19	Fri 10/25/19
Mapping & Analysis	2 wks	Mon 10/28/19	Mon 11/11/19
Data validation	3 wks	Mon 10/28/19	Mon 11/18/19
Recommendations for Contingency Soil Sampling	1 wk	Wed 9/18/19	Tue 9/24/19
Contingency Soil Sampling	2 wks	Wed 10/9/19	Tue 10/22/19
Contingency Lab Analytical	10 days	Wed 10/23/19	Tue 11/5/19
Contingency Mapping & Analysis	1 wk	Wed 11/6/19	Tue 11/12/19
Contingency Data validation	3 wks	Wed 11/6/19	Fri 11/29/19

Note:

1- Schedule for remedial investigation work east of the gymnasium will be coordinated with the Interim Remedial Measures Project Team.

FIGURES



Notes
1. Topographic map accessed via ArcGIS Online and provided by National Geographic Society and i-cubed on 1 August 2018. Elmira, New York Quadrangle (1971, photorevised 1976) is shown.

Site Location Map

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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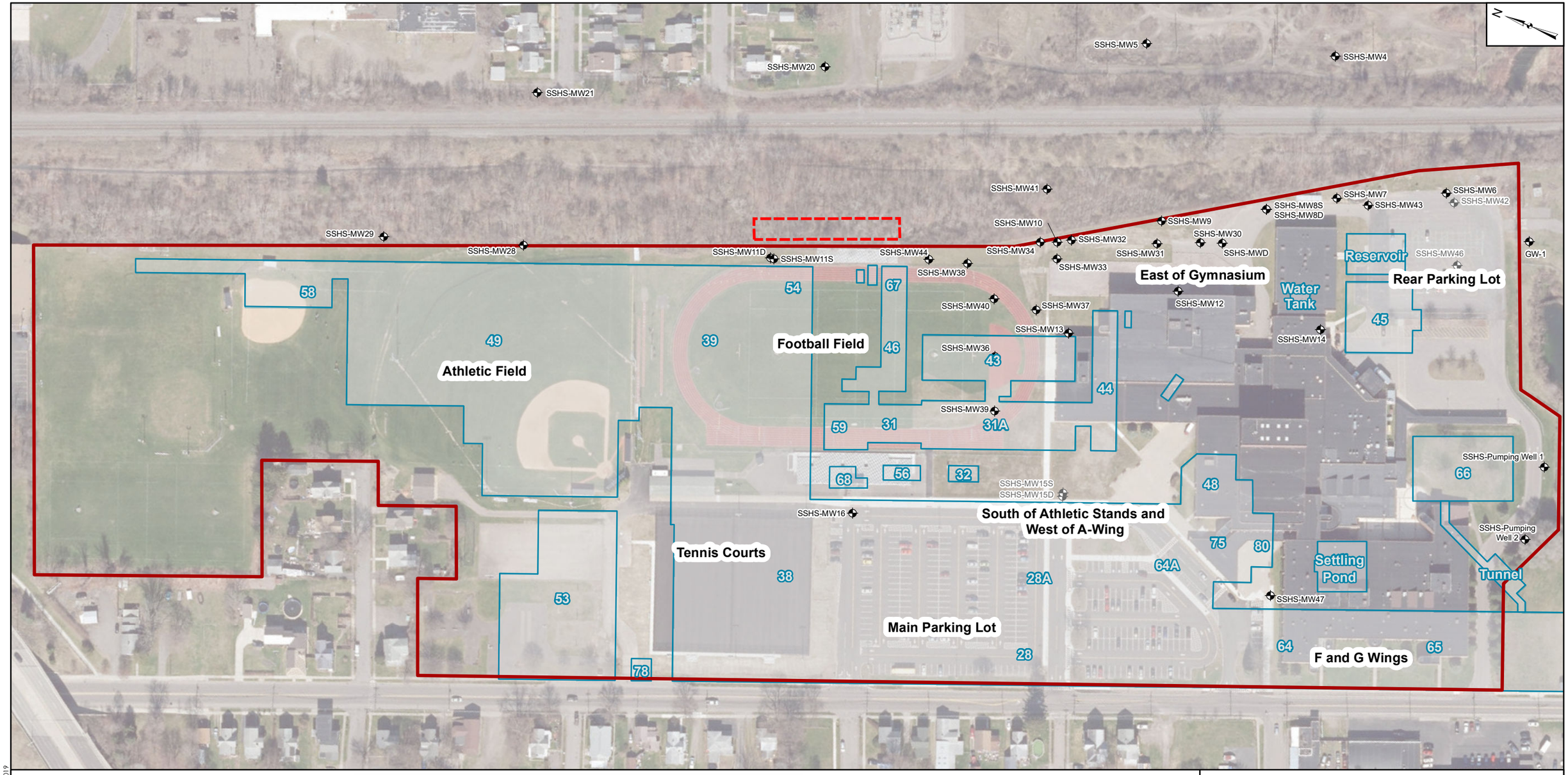
Figure 1



Explanation

- Site Boundary
- Historical Structure
- Former Railroad Siding Area
- Permanent Monitoring Well
- Former Monitoring Well

Remington Rand Building Number	Former Plant Operation	Remington Rand Building Number	Former Plant Operation
28, 28A, 38, 64A	Machine Shop, Factory Building	54	Oil Handling
31A	Tool Hardening	56	Machine Shop
31	Carbonizing	58	Steel Storage
32	Electrical Building	59	Not Identifed
39	Not Identifed	64, 65	Machine Shop
43	Heat Treating	66	Storage
44	Blower Room and Cooling Shed	67	Sand Blasting
45	Engine Room	68	Locker Room
46	Sand Blasting	75	Not Identifed
48	Not Identifed	78	Not Identifed
49	Machine Shop	80	Not Identifed
53	Garage, Recreation Hall and Cafeteria		

Notes

1. Aerial imagery accessed via ArcGIS Online and provided by Microsoft on 20 May 2019. Image is dated 30 April 2018.
2. Historical structures georeferenced from a PDF drawing ROE-2 Site Plan prepared by Lancy Laboratories, Inc. (1967). Inherently, georeferencing introduces slight distortortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
3. Site boundary provided by Site Utility Plan (Hunt, February 2017).
4. Former plant operation obtained from the Preliminary Site Assessment (Dames & Moore, 1988).

150 75 0 150 Feet

Site Map

Former Sperry Remington - North Portion #808022
Elmira, New York

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Figure 2

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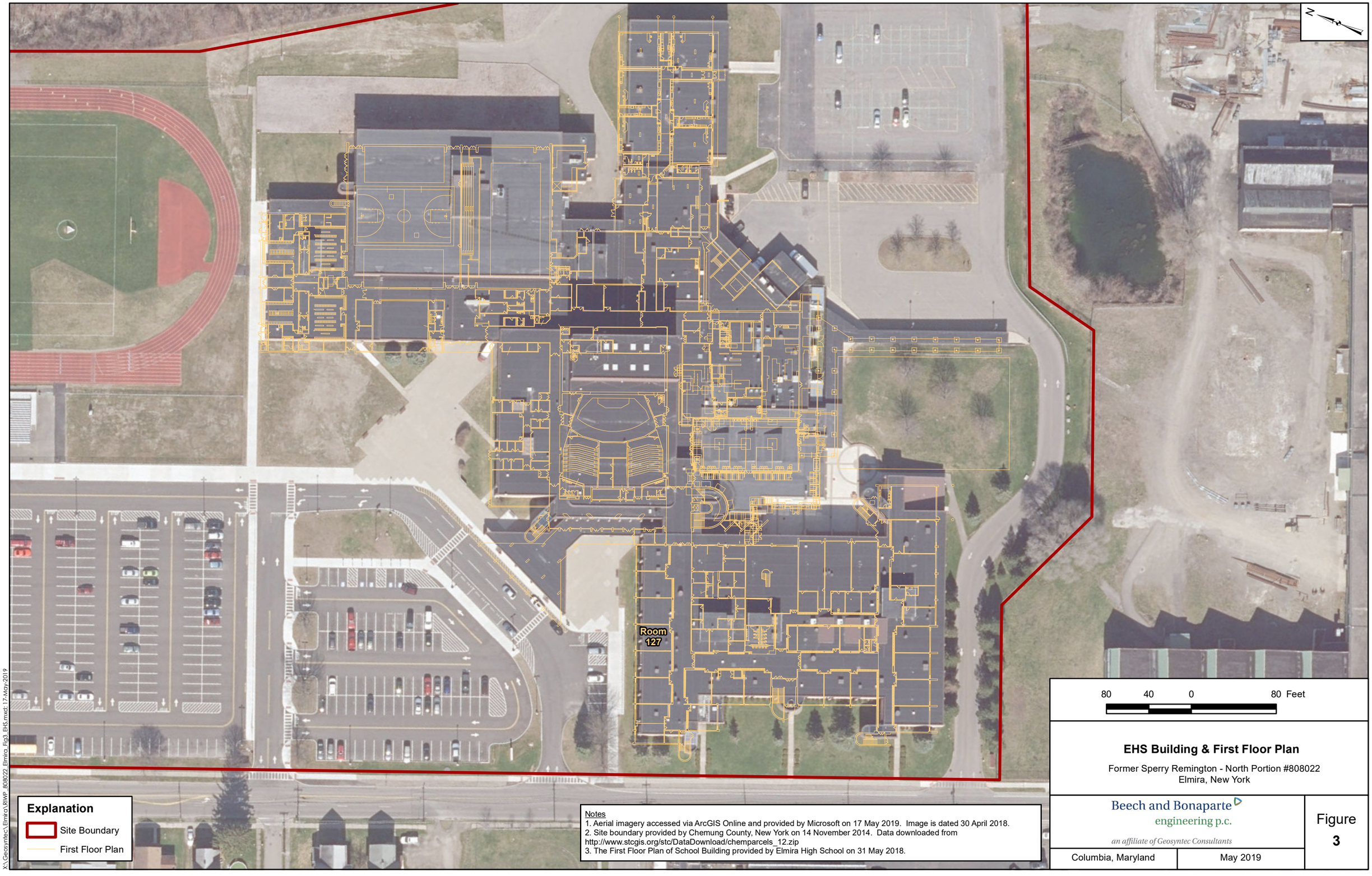


Notes
1. Aerial imagery accessed via ArcGIS Online and provided by Microsoft on 17 May 2019. Image is dated 30 April 2018.
2. Site boundary provided by Chemung County, New York on 14 November 2014. Data downloaded from http://www.stcgis.org/stc/DataDownload/chemparcels_12.zip
3. The First Floor Plan of School Building provided by Elmira High School on 31 May 2018.

EHS Building & First Floor Plan

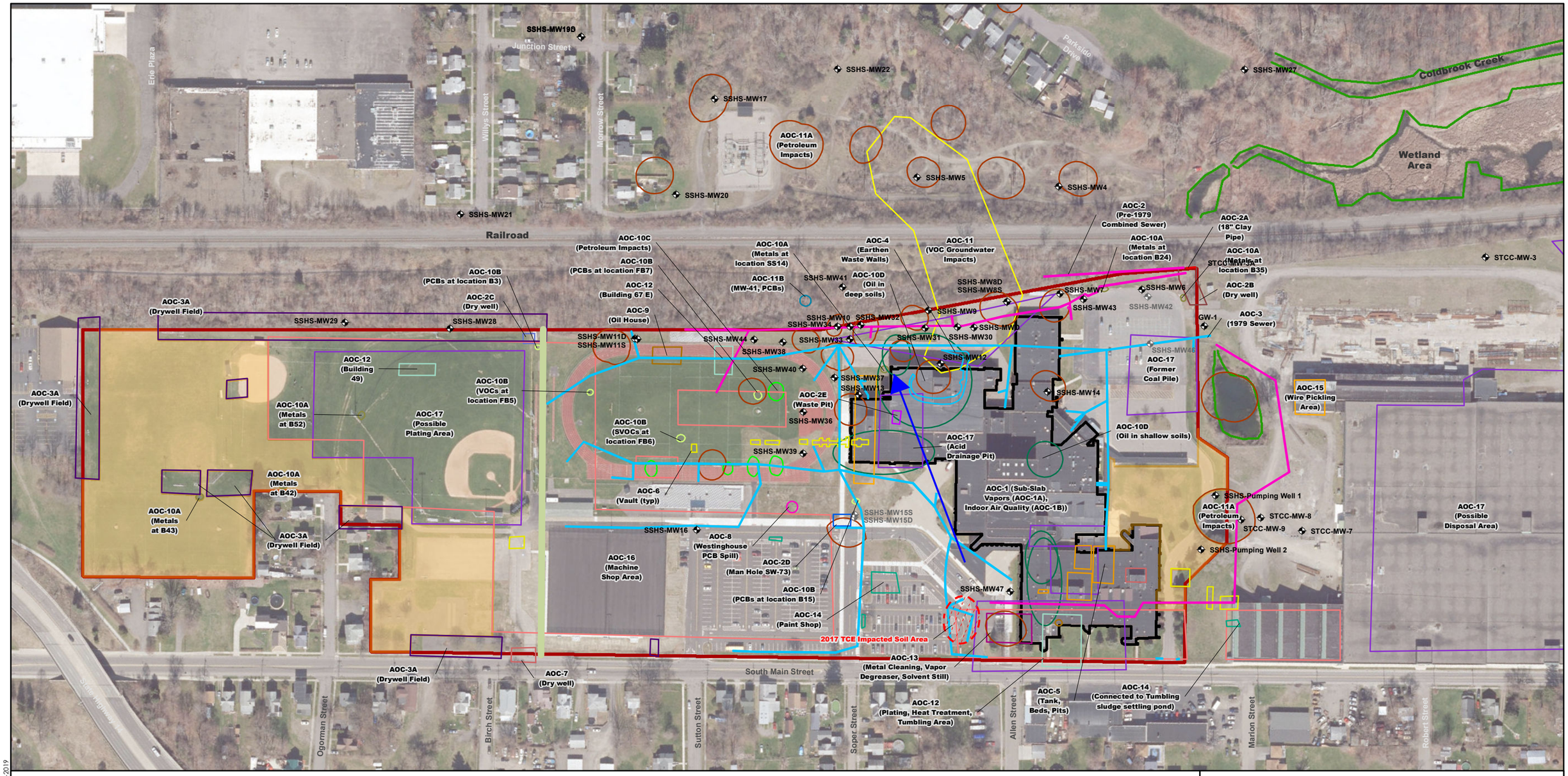
Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure 3

X:\Geosyntec\Elmira\RIWP_808022_Elmira_Fig3_EHS.mxd; 17-May-2019



Explanation

- Site Boundary
- School Building (AOC-1)
- 2017 TCE Impacted Soil Area
- Other Areas
- Sanitary Sewer
- Groundwater Flow Direction
- Permanent Monitoring Well
- Former Monitoring Well

AOC-2, AOC-2A, AOC-2B, AOC-2C, AOC-2D, AOC-2E, AOC-3, AOC-3A, AOC-4, AOC-5, AOC-6, AOC-7, AOC-8, AOC-9, AOC-10A, AOC-10B, AOC-10C, AOC-10D, AOC-11, AOC-11A, AOC-11B, AOC-12, AOC-13, AOC-14, AOC-15, AOC-16, AOC-17

Notes

1. Aerial imagery accessed via ArcGIS Online and provided by Microsoft on 29 May 2019. Image is dated 30 April 2018.
2. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
3. Former Combined Industrial Sewer (Pre-1979), site boundary, underground gas line and catch basin locations from the Site Utility Plan (Hunt, February 2017) and a topographic survey of the southern Football Field Complex

N

200 100 0 200 Feet

Areas of Concern (AOCs)

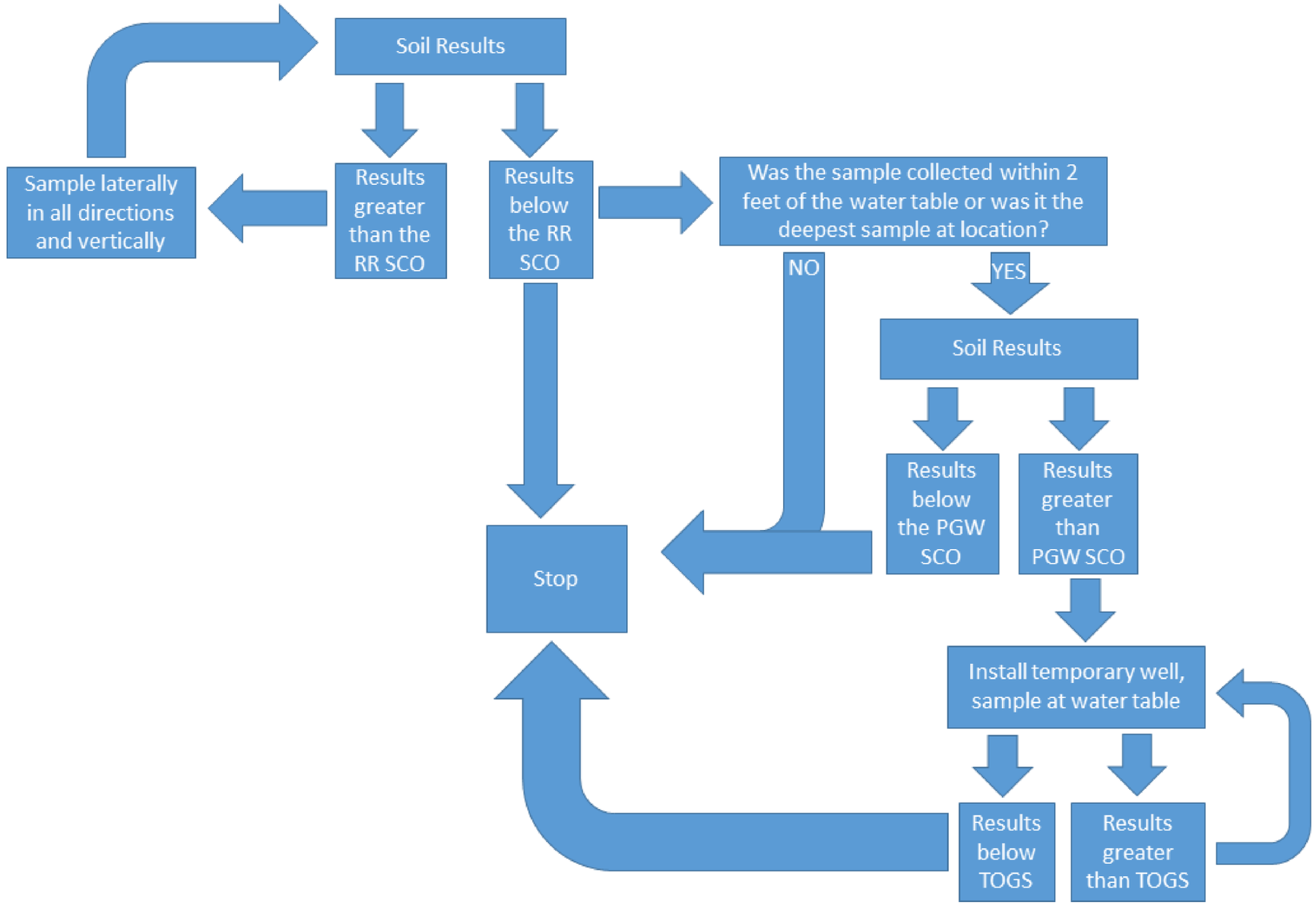
Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure 4

X:\Geosyntec\Elmira\RIWP_808022_Elmira_Fig4_AOC.mxd: 29-May-2019



Notes

SCO – Soil Cleanup Objective
RR – Restricted Residential (6 NYCRR PART 375)
PGW – Protection of Groundwater (6 NYCRR PART 375)
TOGS – Technical & Operational Guidance Series (NYSDEC TOGS 1.1.1)

RI Sampling Flow Chart

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure 5

C:\Users\eanderson\Desktop\Elmira ArcGIS\RI Sampling flow chart.mxd 5/29/2019 4:40:31 PM

CB-24	
Date	9/1/2016
Lead	1,600 mg/kg
Chromium	520 mg/kg
Copper	3,100 mg/kg
Nickel	1,100 mg/kg
Silver	5.3 mg/kg
Zinc	3,800 mg/kg
PCBs	2,400 mg/kg

CB-01	
Date	9/1/2016
Lead	310 mg/kg
Nickel	170 mg/kg
PCBs	160 mg/kg

CB-02	
Date	9/1/2016
PCBs	18 mg/kg

CB-06	
Date	5/28/2015
PAHs	156.9 mg/kg

CB-07	
Date	5/28/2015
PCBs	1.785 mg/kg

CB-03	
Date	5/28/2015
Lead	860 mg/kg
Chromium	120 mg/kg
Copper	450 mg/kg
Nickel	200 mg/kg
Silver	790 mg/kg
Zinc	41.73 mg/kg
PCBs	26.4 mg/kg

CB-15		
	CB-15-0-0.17	CB-15-0.17-0.83
Date	11/16/2017	11/16/2017
PCBs	36 mg/kg	190 mg/kg
Chromium (III+VI)	44 mg/kg	200 mg/kg
Copper	180F2 mg/kg	610 mg/kg
Mercury	0.2 mg/kg	11 mg/kg
Nickel	100F1 mg/kg	420 mg/kg
Silver	1.3 mg/kg	6.7 mg/kg
Zinc	510 mg/kg	1,000 mg/kg
PAHs	41.95 mg/kg	526.7 mg/kg

Bottom Invert 838.86

Breach and Obstruction Invert Depth of 7 ft.

Obstruction

Breach and Obstruction

Breach and Obstruction Invert Depth of 7 ft.

Silted Invert - 839.16@bottom

Bulkheaded

Breach and Obstruction Invert Depth of 14 ft.

Bulkheaded

12" Sanitary Sewer

CB-15, CB-24, CB-01, CB-02, CB-03, CB-04, CB-05, CB-06, CB-07, CB-08, CB-09, CB-11, CB-12, CB-13, CB-14, CB-16, CB-17, CB-18, CB-19, CB-20, CB-21, CB-22, CB-23, CB-25, CB-26, CB-27, CB-28, CB-29, CB-30, CB-31, CB-32, CB-33, CB-34, CB-35, CB-36, CB-37, CB-38

SSHS-MW41, SSHS-MW32, SSHS-MW9, SSHS-MW8S, SSHS-MW8D, SSHS-MW7, SSHS-MW43, SSHS-MW6, SSHS-MW42, SSHS-MW11D, SSHS-MW11S, SSHS-MW44, SSHS-MW38, SSHS-MW34, SSHS-MW10, SSHS-MW33, SSHS-MW31, SSHS-MW30, SSHS-MWD, GW-1, SSHS-MW46, SSHS-MW12, SSHS-MW40, SSHS-MW37, SSHS-MW13, SSHS-MW14, SSHS-MW36, SSHS-MW39, SSHS-MW15S, SSHS-MW15D, SSHS-MW16, SSHS-MW47, SSHS-Pumping Well 1, SSHS-Pumping Well 2, STCC-MW-8, STCC-MW-9

MH-1

Explanation

- Site Boundary
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Groundwater Flow Direction
- Direction of Stormwater Flow
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Former Combined Industrial Sewer (Pre-1979), estimated
- Current EHS Storm Water Sewer (Post-1979)
- Sanitary Sewer
- Former Sperry Remington Site (#808043) Investigation (Geosyntec 2013)

Notes
1. Aerial imagery accessed via ArcGIS Online and provided by Microsoft on 28 May 2019. Image is dated 30 April 2018.
2. Former Combined Industrial Sewer (Pre-1979), site boundary, underground gas line and catch basin locations from the Site Utility Plan (Hunt, February 2017) and a topographic survey of the southern Football Field Complex
3. Invert elevations (INV) in feet mean sea level are from the Site Utility Plan (Hunt, February 2017), survey conducted by Fagan at Football Field Complex in August 2018, and topographic survey of former Remington Rand Site (Weiler Associates, April 2011).

120 60 0 120 Feet

Former Combined Industrial Sewer and Current EHS Storm Water Sewer

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure 6

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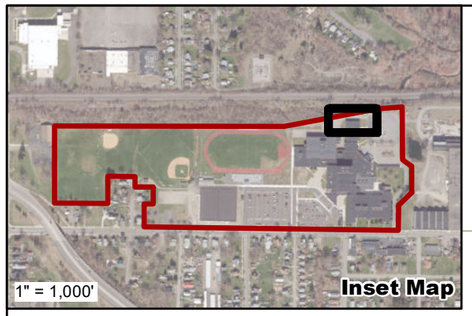

Text box refers to exceedances of SCOs

Test Pit + Camera
Geophysical Survey

AOC-2
(Former Industrial Sewer)

AOC-10A
(Metals at location B24)

SSHS-B3082

SHIPPING CONTAINER

SSHS-MW7

SSHS-MW43

SSHS-B3081

SSHS-MW8S

SSHS-MW8D

TOGS exceedances of PCBs and SVOCs at SSHS-B510

Test Pit + Camera

CB-03

Silted Invert - 839.16@bottom

Test Pit + Camera

SSHS-B3002

Breach and Obstruction
Invert Depth of 7 ft.

Breach and Obstruction
Invert Depth of ~14 ft.
Bulkheaded

INV841.99

AOC-17
(Possible Disposal Area)

SSHS-MWD

CB-04

AOC-3
1979 Sewer)

INV838.67

MULCH

WOOD REMAINING IN PLACE

ASPHALT

GRAVEL

CONCRETE

RAMP

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-2
- AOC-3
- AOC-10A
- AOC-10D
- AOC-17

Notes

1. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
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3. Football Field Complex RI was completed between July 23 and July 28, 2018.
4. Invert elevations (INV) in feet mean sea level are from the Site Utility Plan (Hunt, February 2017), survey conducted by Fagan at Football Field Complex in August 2018, and topographic survey of former Remington Rand Site (Weiler Associates, April 2011).

Abbreviations

RI = Remedial Investigation
IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
East of Gymnasium - South

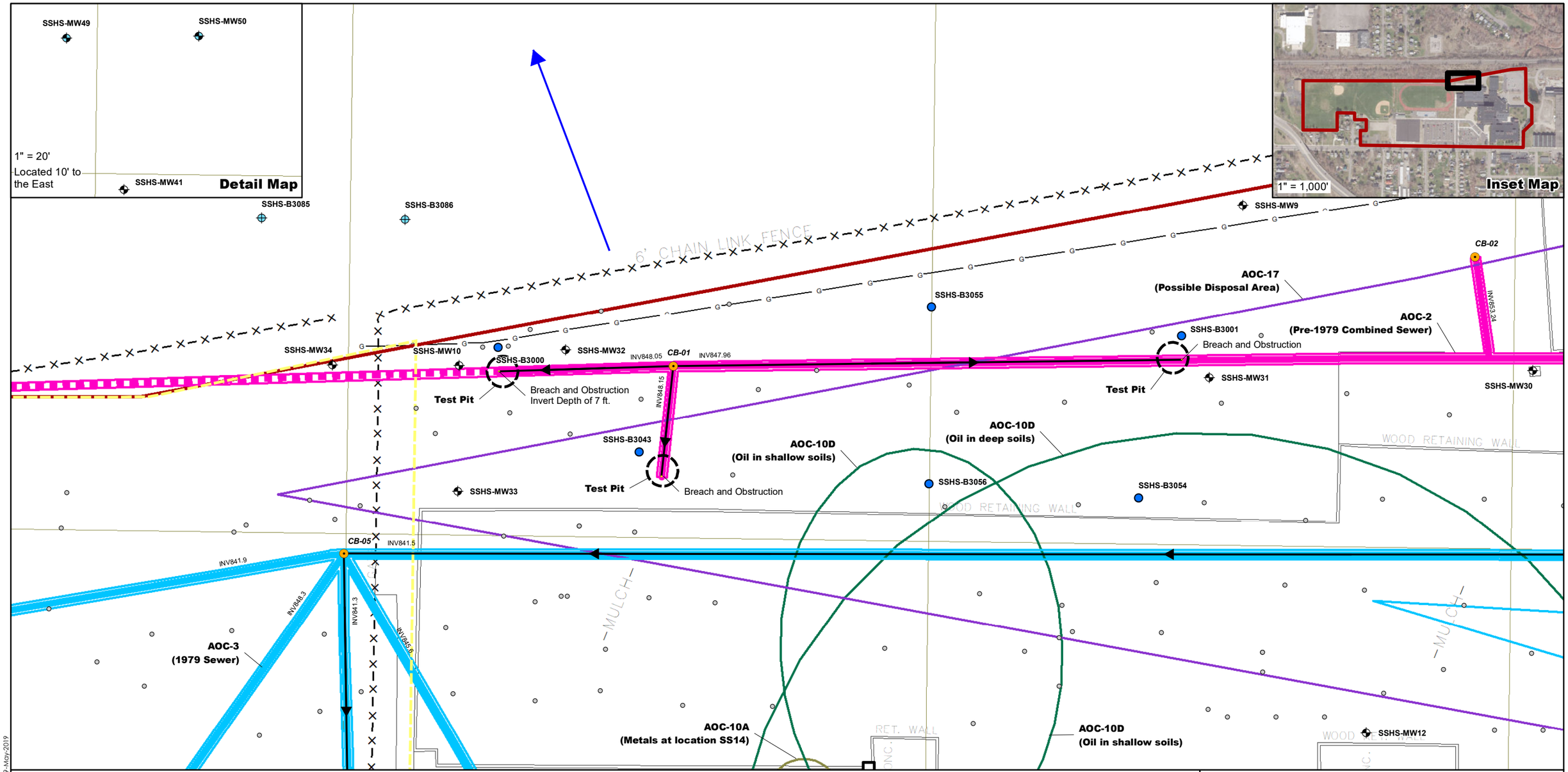
Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure
7A

X:\Geosyntec\ Elmira\RIWP_808022_Elmira_DDP_RI\SampLoc.mxd: 29-May-2019



Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-2
- AOC-3
- AOC-4
- AOC-10A
- AOC-10D
- AOC-17

Notes

1. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
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3. Football Field Complex RI was completed between July 23 and July 28, 2018.
4. Invert elevations (INV) in feet mean sea level are from the Site Utility Plan (Hunt, February 2017), survey conducted by Fagan at Football Field Complex in August 2018, and topographic survey of former Remington Rand Site (Weiler Associates, April 2011).

Abbreviations

RI = Remedial Investigation
SC = Site Charaterization
IRM = Interim Remedial Measure
PDI = Pre-design Investigation

20 10 0 20 Feet

Investigation Plan
East of Gymnasium - North

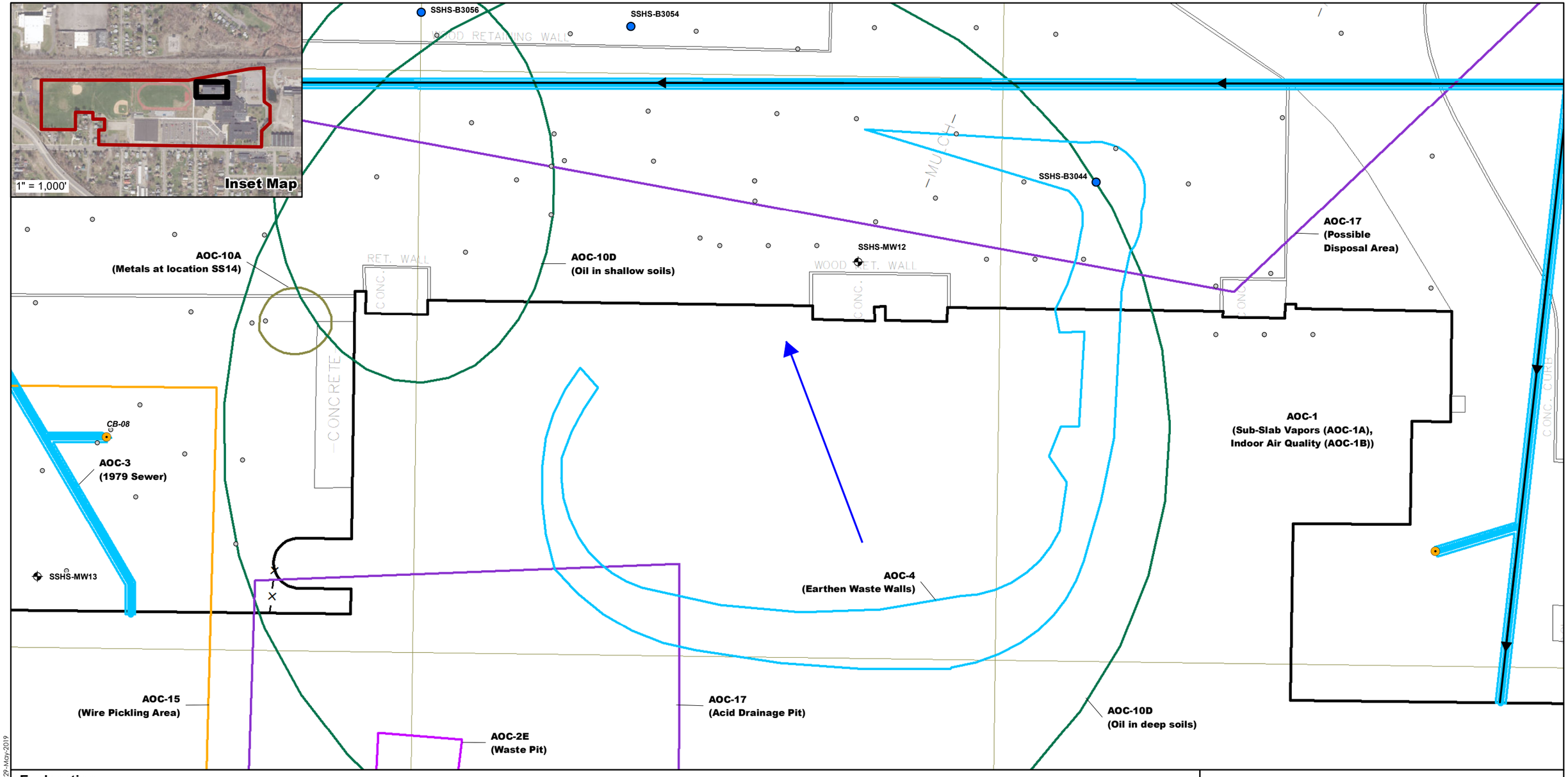
Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure 7B

X:\Geosyntec\Elmira\RIWP_808022_Elmira_DDP_RI\SampleLoc.mxd: 29-May-2019



Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-2
- AOC-2E
- AOC-3
- AOC-4
- AOC-10A
- AOC-10D
- AOC-15
- AOC-17

Notes

1. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
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3. Football Field Complex RI was completed between July 23 and July 28, 2018.
4. Invert elevations (INV) in feet mean sea level are from the Site Utility Plan (Hunt, February 2017), survey conducted by Fagan at Football Field Complex in August 2018, and topographic survey of former Remington Rand Site (Weiler Associates, April 2011).

Abbreviations

RI = Remedial Investigation
IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
East of Gymnasium - West

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure
7C

X:\Geosyntec\Elmira\RIWP_808022_Elmira_DDP_RI\SampLoc.mxd; 29-May-2019

A

A'

MW-11S/D

SSHS-MW44

SSHS-MW32

SSHS-MW31

SSHS-MW30

MW-D

SSHS-MW43

SSHS-B101

SSHS-B64

SSHS-MW42

SSHS-B65

BROWN FILL SAND AND GRAVEL AND TRACE MISC. DEBRIS

BLACK FILL SAND WITH GRAVEL AND ASHY LIKE MATERIAL

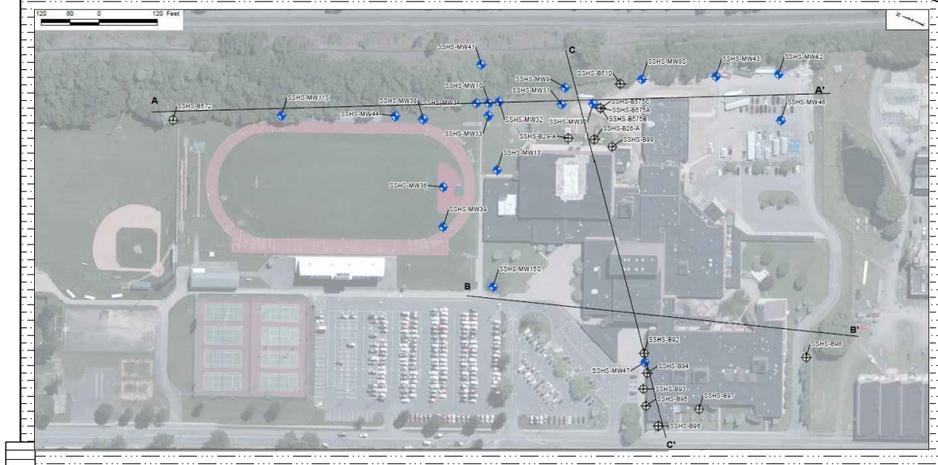
GRAVEL WITH SILT AND SAND

SILTY CLAY

WEATHERED SHALE BEDROCK

ELEVATION - FEET, MEAN SEA LEVEL

855
850
840
830
820
810
800
790
780
770



LEGEND

- GRAVEL WITH SILT AND SAND
- BROWN FILL SAND AND GRAVEL AND TRACE MISC. DEBRIS
- BLACK FILL SAND WITH GRAVEL AND ASHY LIKE MATERIAL
- SILTY CLAY
- WEATHERED SHALE BEDROCK
- APPROXIMATE GROUNDWATER ELEVATION
- APPROXIMATE CONTACT
- KNOWN CONTACT

0 100'

HORIZONTAL SCALE: 1" = 100'

0 10'

VERTICAL SCALE: 1" = 10'

NOTES:

1. GEOLOGIC CONDITIONS INTERPRETED FROM BORING LOGS PRESENTED IN VARIOUS HISTORICAL REPORTS AND OBSERVATIONS MADE DURING THIS INVESTIGATION.
2. GEOLOGIC CONDITIONS MAY VARY FROM THAT SHOWN.
3. MW-11 S/D ARE SEPARATE COMPLETIONS IN SEPARATE BOREHOLES BUT SHOWN ON ONE WELL SYMBOL FOR CLARITY.

CROSS SECTION, NORTH TO SOUTH, EAST OF GYMNASIUM

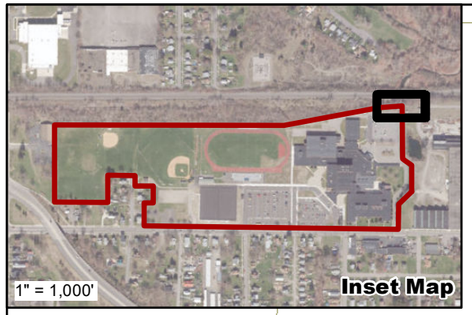
FORMER SPERRY REMINGTON - NORTH PORTION #808022
ELMIRA, NEW YORK

Geosyntec consultants

COLUMBIA, MD | MAY 2019

FIGURE 8

P:\CADD\GEO-MINNEAPOLIS\0832 ELMIRA\0832F000\0832F004-1 - Last Saved by: bferrick on 5/17/19



Steep Sloping Area

Steep Sloping Area

Steep Sloping Area

Geophysical Survey

AOC-2
(Pre-1979 Combined Sewer)

AOC-2A
(18" Clay Pipe)

Bottom Invert 838.86

Test Pit

CB-15

SSHS-B3003

Sample to 18ft Depth

SSHS-B3053

SSHS-B3087

Approximate Location of Gas Line

AOC-2
(Former Industrial Sewer)

STCC-MW-3A

Site Culvert

SSHS-B3078

SSHS-MW6

SSHS-MW42

AOC-10A
(Metals at location B35)

AOC-2B
(Dry well)

5-ft Box Culvert

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-2
- AOC-2A
- AOC-2B
- AOC-10A

Notes

1. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
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Abbreviations

RI = Remedial Investigation
IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
CB-15/AOC-2A/2B

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure 9

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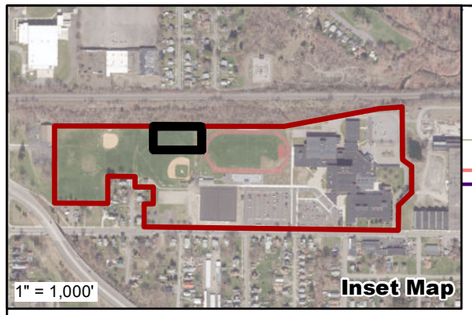

SSHS-B3010

SSHS-B3011

Test Pit

AOC-16
(Machine Shop Area)

AOC-2C
(Dry well)

AOC-10B
(PCBs at location B3)

AOC-3A
(Drywell Field)

AOC-17
(Possible Plating Area)

AOC-12
(Building 49)

SSHS-B3018

SSHS-B3061

SSHS-B3019

AOC-3
(1979 Sewer)

CB-25

FENCE

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-2C
- AOC-3
- AOC-3A
- AOC-10B
- AOC-12
- AOC-16
- AOC-17

Notes
1. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
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Abbreviations
RI = Remedial Investigation
IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, Southeast

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure
10A

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SSHS-B3007

SSHS-B3008

SSHS-B3009

AOC-3A
(Drywell Field)

-DUGOUT-

AOC-16
(Machine Shop Area)

SSHS-B3057

SSHS-B3058

AOC-17
(Possible Plating Area)

SSHS-B3059

SSHS-B3060

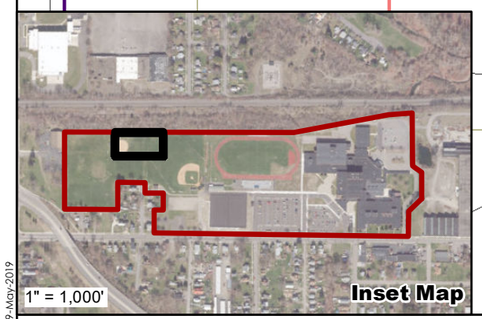
AOC-12
(Building 49)

AOC-3A
(Drywell Field)

-OUTFIELD GRASS-

SSHS-B3016

SSHS-B3017



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Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3A
- AOC-16
- AOC-12
- AOC-17

Notes
1. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
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Abbreviations
RI = Remedial Investigation
SC = Site Charaterization
IRM = Interim Remedial Measure
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, East

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure
10B

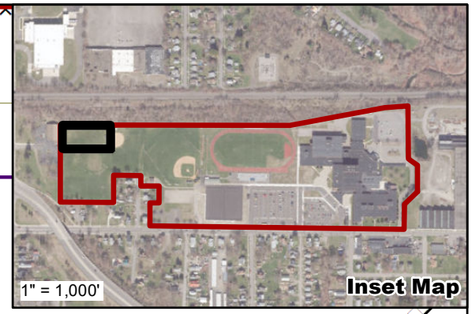
SSHS-B3004

SSHS-B3089

SSHS-B3005

SSHS-B3006

AOC-3A
(Drywell Field)



PUGOUT

SSHS-B3012

SSHS-B3013

SSHS-B3014

SSHS-B3015

AOC-3A
(Drywell Field)

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
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- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
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- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3A

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Abbreviations
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IRM = Interim Remedial Measure
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, Northeast

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Figure
10C

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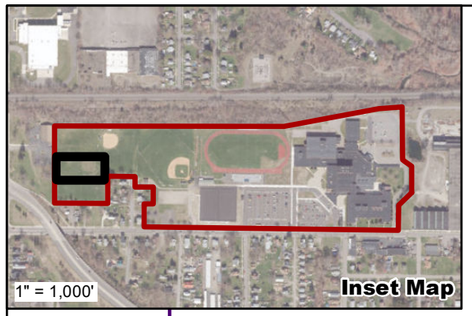

SSHS-B3020

SSHS-B3021

SSHS-B3022

SSHS-B3030

SSHS-B3023

AOC-3A
(Drywell Field)

AOC-3A
(Drywell Field)

SCO exceedances for lead at SSHS-B43 (0.5 to 2.5 ft bgs)

AOC-10A
(Metals at B43)

Text box refers to exceedances of SCOs

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
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- Sanitary Sewer, Solid
- Catch Basins
- Manhole
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- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3A
- AOC-10A

Notes

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Abbreviations

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IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, North

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure
10D

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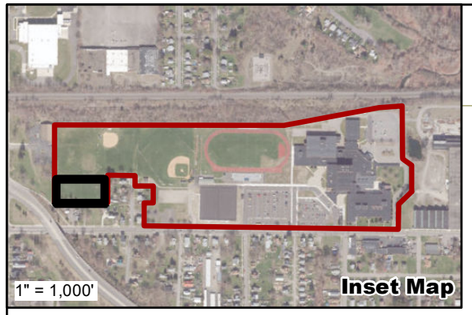

SSHS-B3088
SSHS-B3029
SSHS-B3035
SSHS-B3036

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
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- 2017 TCE Impacted Soil Area
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Notes
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Abbreviations
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SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, Northwest

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure **10E**

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SCO exceedances for lead, arsenic, copper and nickel at SSHS-B42 (0.5 to 2.5 ft bgs)

AOC-10A
(Metals at B42)

12' CHAIN LINK FENCE

6' CHAIN LINK

AOC-16
(Machine Shop Area)

SSHS-B3028

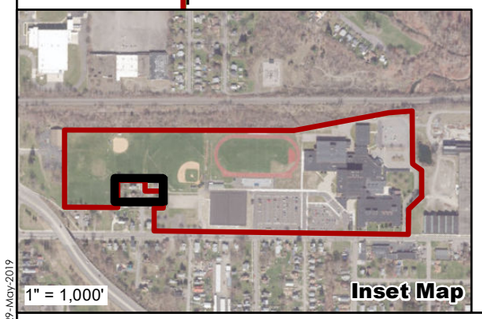
BUILDING

CONCRETE

ASPHALT

6' CH LINK FENCE

AOC-3A
(Drywell Field)



Text box refers to exceedances of SCOs

Explanation

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- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
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- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3A
- AOC-16
- AOC-10A

Notes

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Abbreviations

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IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, West

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure
10F

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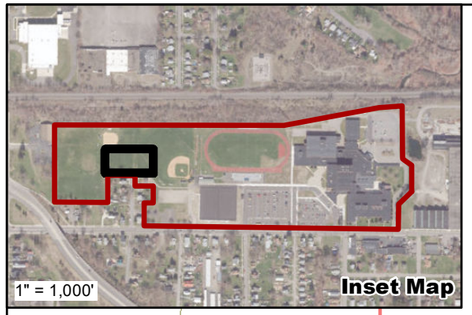

SSHS-B3062

SSHS-B3063

SSHS-B3064

AOC-10A
(Metals at B52)

SSHS-B3065

AOC-16
(Machine Shop Area)

AOC-17
(Possible Plating Area)

SSHS-B3024

SSHS-B3025

AOC-17
(Possible Plating Area)

8' TALL WOOD WALL

AOC-3A
(Drywell Field)

-BATTING CAGE-

Explanation

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- School Building (AOC-1)
- 120' x 120' Grid
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- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3A
- AOC-10A
- AOC-16
- AOC-17

Notes
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N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, Central

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure
10G

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SSHS-B3066

SSHS-B3067

AOC-16
(Machine Shop Area)

SSHS-B3068

AOC-17
(Possible Plating Area)

OUTFIELD GRASS

DIRT INFIELD

SSHS-B3070

SSHS-B3026

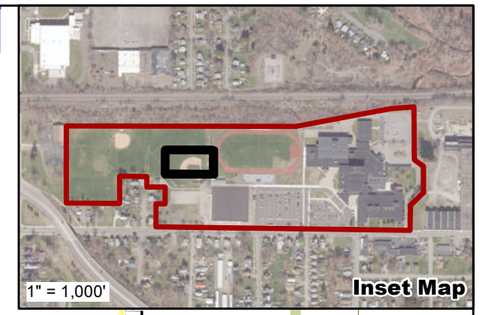
SSHS-B3027

AOC-17
(Possible Plating Area)

INFIELD GRASS

SSHS-B3069

MH-1



Explanation

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- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
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- Excavated Areas for IRM#2
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- Current EHS Storm Water Sewer (Post-1979), Solid
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- Catch Basins
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- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-16
- AOC-17

Notes
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SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
Athletic Fields, South

Former Sperry Remington - North Portion #808022
Elmira, New York

DRAFT

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Columbia, Maryland | May 2019

Figure
10H

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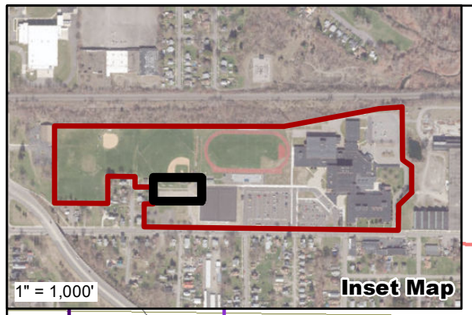

AOC-16
(Machine Shop Area)

AOC-17
(Possible Plating Area)

AOC-3A
(Drywell Field)

AOC-6
(Vault (typ))

SSHS-B3031

SSHS-B3032

SSHS-B3051

-ASPHALT-

-ASPHALT PARKING LOT-

ASPHALT CURB

TREE LINE

-B A-

Explanation

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- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3A
- AOC-16
- AOC-6
- AOC-17

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Abbreviations
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PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
North Parking Lot, East

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure
11A

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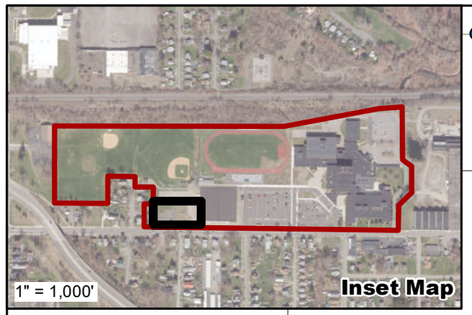

Text box refers to exceedances of SCOs

Restricted Residential SCO exceedance of PCBs at NE SIDEWALL S1

SSHS-B3050

SSHS-B3079

SSHS-B3080

AOC-16
(Machine Shop Area)

AOC-3A
(Drywell Field)

SSHS-B3052

SSHS-B3038

CONC. CURB

ASPH

ASPHALT

CONCRETE

VOLLEYBALL NET

SAND VOLLEYBALL COURT

Detail Map 1" = 20' Located 100' to the South

SSHS-B3039

AOC-16
(Machine Shop Area)

Detail Map 1" = 20' Located 200' to the South

SSHS-B3040

AOC-3A
(Drywell Field)

Explanation

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- AOC-16

Notes
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3. Football Field Complex RI was completed between July 23 and July 28, 2018.
4. Invert elevations (INV) in feet mean sea level are from the Site Utility Plan (Hunt, February 2017), survey conducted by Fagan at Football Field Complex in August 2018, and topographic survey of former Remington Rand Site (Weiler Associates, April 2011).

Abbreviations
RI = Remedial Investigation
SC = Site Charaterization
IRM = Interim Remedial Measure
PDI = Pre-design Investigation

20 10 0 20 Feet

Investigation Plan
North Parking Lot, West

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure 11B

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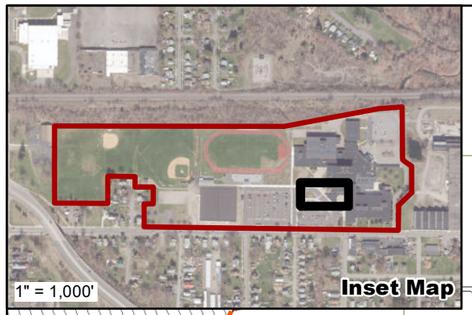

AOC-1
(Sub-Slab Vapors (AOC-1A),
Indoor Air Quality (AOC-1B))

CB-17

AOC-3
(1979 Sewer)

SSHS-B3083

SSHS-B3071

AOC-14
(Paint Shop)

SSHS-B3076

SSHS-B3074

CB-18

SSHS-B3037

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3
- AOC-14

Notes
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Abbreviations
RI = Remedial Investigation IRM = Interim Remedial Measure
SC = Site Charaterization PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
TCE Investigation Area, East

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure
12A

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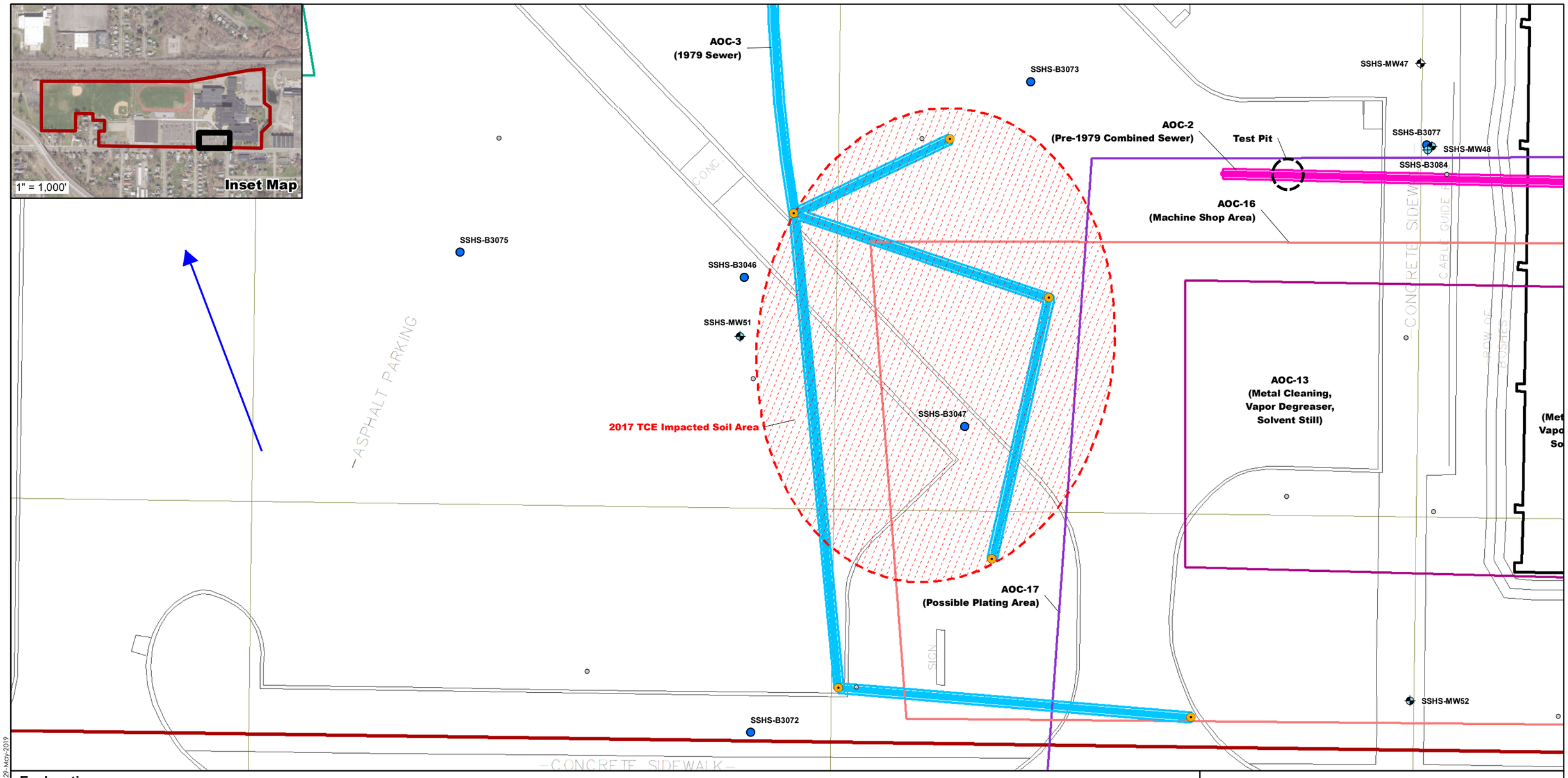

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-2
- AOC-3
- AOC-13
- AOC-14
- AOC-16
- AOC-17

Notes

1. Areas of concern (AOC) georeferenced from PDF drawings provided by New York State Department of Environmental Conservation (NYSDEC). Georeferenced items may include: historical site features, hand-drawn features, features that were not to scale, or features that were originally on a map that contained a different projection. Inherently, georeferencing introduces slight distortortions and inaccuracies in spatial data, but these distortions and inaccuracies may be exacerbated by the factors listed above. All reasonable efforts were made to accurately reflect the data provided.
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Abbreviations

RI = Remedial Investigation
IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
TCE Investigation Soil Area, West

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure **12B**

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B

B'

MW-15S/D

SSHS-B92

SCHOOL BUILDING

SSHS-B98

PRODUCTION WELL

FILL SAND AND GRAVEL AND TRACE MISC. DEBRIS

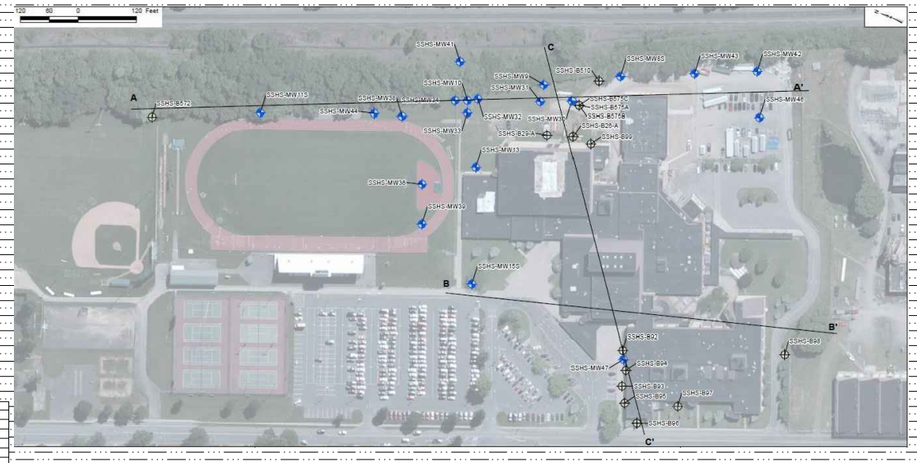
GRAVEL WITH SILT AND SAND

SILTY CLAY

WEATHERED SHALE BEDROCK

ELEVATION - FEET, MEAN SEA LEVEL

855
850
840
830
820
810
800
790
780



LEGEND

- GRAVEL WITH SILT AND SAND
- FILL SAND AND GRAVEL AND TRACE MISC. DEBRIS
- SILTY CLAY
- WEATHERED SHALE BEDROCK
- APPROXIMATE GROUNDWATER ELEVATION
- APPROXIMATE CONTACT
- KNOWN CONTACT

0 100’

HORIZONTAL SCALE: 1” = 100’

0 10’

VERTICAL SCALE: 1” = 10’

NOTES:

1. GEOLOGIC CONDITIONS INTERPRETED FROM BORING LOGS PRESENTED IN VARIOUS HISTORICAL REPORTS AND OBSERVATIONS MADE DURING THIS INVESTIGATION.
2. GEOLOGIC CONDITIONS MAY VARY FROM THAT SHOWN.
3. MW-15 S/D ARE SEPARATE COMPLETIONS IN SEPARATE BOREHOLES BUT SHOWN ON ONE WELL SYMBOL FOR CLARITY.

CROSS SECTION, NORTH TO SOUTH,
TCE INVESTIGATION AREA

FORMER SPERRY REMINGTON -
NORTH PORTION #808022
ELMIRA, NEW YORK

Geosyntec consultants

COLUMBIA, MD | MAY 2019

FIGURE
13

P:\CADD\GEO-MINNEAPOLIS\0832 ELMIRA\0832F000\0832F004-1 - Last Saved by: bferrick on 5/17/19

C

C'

MW-D

SSHS-B99

SCHOOL BUILDING

SSHS-B92

SSHS-MW47

SSHS-B93

SSHS-B95

SSHS-B96

FILL SAND AND GRAVEL AND TRACE MISC. DEBRIS

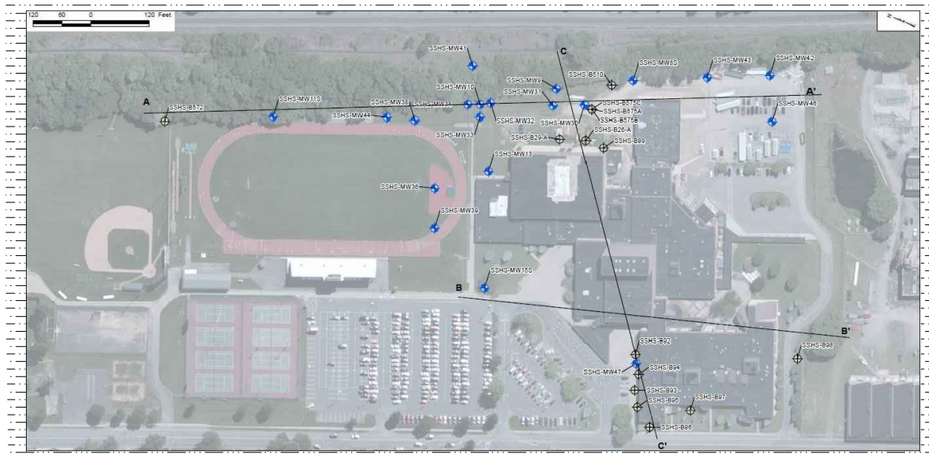
GRAVEL WITH SILT AND SAND

SILTY CLAY

WEATHERED SHALE BEDROCK

ELEVATION - FEET, MEAN SEA LEVEL

855
850
840
830
820
810
800
790
780
770



LEGEND

- GRAVEL WITH SILT AND SAND
- FILL SAND AND GRAVEL AND TRACE MISC. DEBRIS
- SILTY CLAY
- WEATHERED SHALE BEDROCK
- APPROXIMATE GROUNDWATER ELEVATION
- APPROXIMATE CONTACT
- KNOWN CONTACT
- INFERRED CONTACT

0 100’

HORIZONTAL SCALE: 1” = 100’

0 10’

VERTICAL SCALE: 1” = 10’

NOTES:

1. GEOLOGIC CONDITIONS INTERPRETED FROM BORING LOGS PRESENTED IN VARIOUS HISTORICAL REPORTS AND OBSERVATIONS MADE DURING THIS INVESTIGATION.
2. GEOLOGIC CONDITIONS MAY VARY FROM THAT SHOWN.

CROSS SECTION, EAST TO WEST,
TCE INVESTIGATION AREA

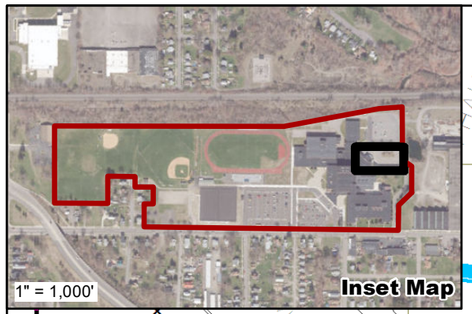
FORMER SPERRY REMINGTON - NORTH PORTION #808022
ELMIRA, NEW YORK

Geosyntec consultants

COLUMBIA, MD | MAY 2019

FIGURE 14

P:\CAD\GEO-MINNEAPOLIS\0832 ELMIRA\0832F000\0832F004-1 - Last Saved by: bferrick on 5/17/19



CB-21

AOC-3
1979 Sewer)

AOC-17
(Former Coal Pile)

AOC-10D
(Oil in shallow soils)

AOC-1
(Sub-Slab Vapors (AOC-1A),
Indoor Air Quality (AOC-1B))

SSHS-B3048

SSHS-B3049

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3
- AOC-17
- AOC-10D

Notes
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IRM = Interim Remedial Measure
SC = Site Charaterization
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan
West of Rear Parking Lot

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure
15A

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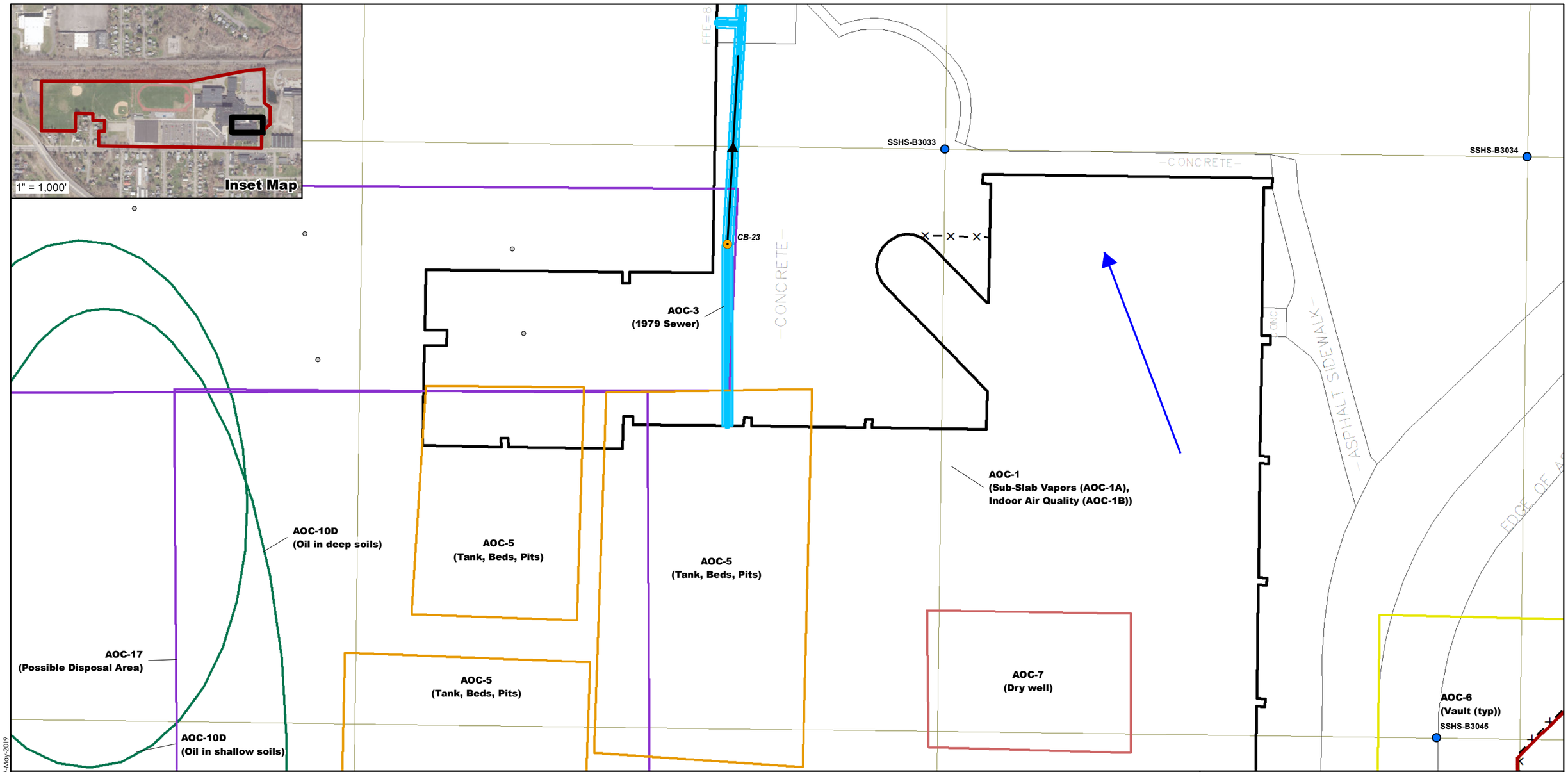

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
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- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-3
- AOC-5
- AOC-6
- AOC-7
- AOC-10D
- AOC-17

Notes
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Abbreviations
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SC = Site Charaterization
IRM = Interim Remedial Measure
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan, South

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure 15B

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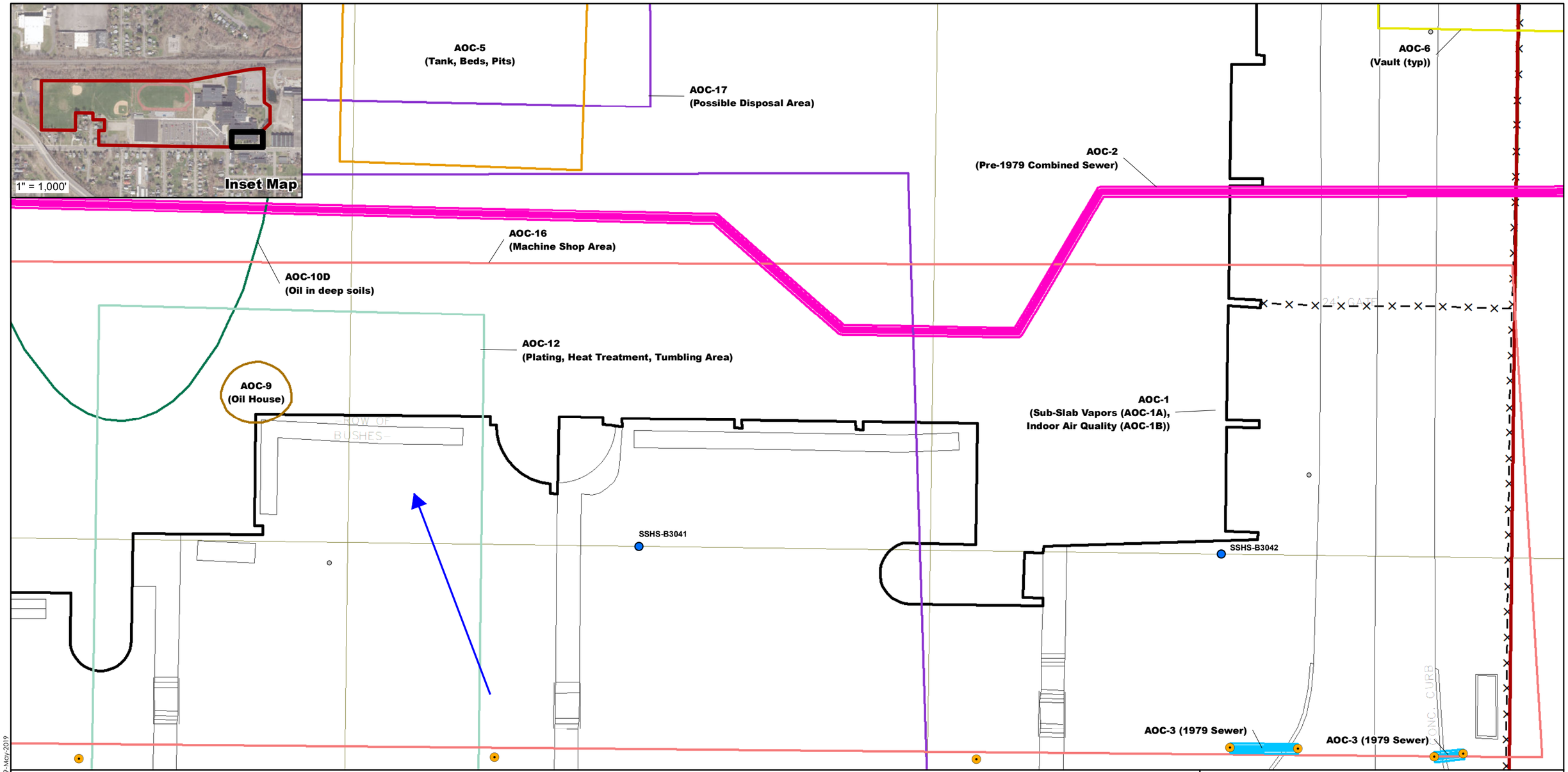

Explanation

- Site Boundary
- School Building (AOC-1)
- 120' x 120' Grid
- Football Field Complex Investigation Area
- Area Characterized during SC and IRM#1 PDI
- Area Characterized during SC and IRM#2 PDI
- Excavated Areas for IRM#1
- Excavated Areas for IRM#2
- Geosyntec Survey (2014)
- Former Combined Industrial Sewer (Pre-1979)
- Current EHS Storm Water Sewer (Post-1979)
- Former Combined Industrial Sewer (Pre-1979), Dashed
- Former Combined Industrial Sewer (Pre-1979), Solid
- Current EHS Storm Water Sewer (Post-1979), Solid
- Sanitary Sewer, Solid
- Catch Basins
- Manhole
- Permanent Monitoring Well
- Former Monitoring Well
- Historical Soil Sample
- Proposed Monitoring Well
- Proposed Temporary Well
- Proposed Site-Wide RI Sampling Location
- 2017 TCE Impacted Soil Area
- Groundwater Flow Direction
- AOC-2
- AOC-3
- AOC-5
- AOC-6
- AOC-9
- AOC-10D
- AOC-12
- AOC-16
- AOC-17

Notes

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Abbreviations

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SC = Site Charaterization
IRM = Interim Remedial Measure
PDI = Pre-design Investigation

N

20 10 0 20 Feet

Investigation Plan, Southwest

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
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Columbia, Maryland | May 2019

Figure 15C

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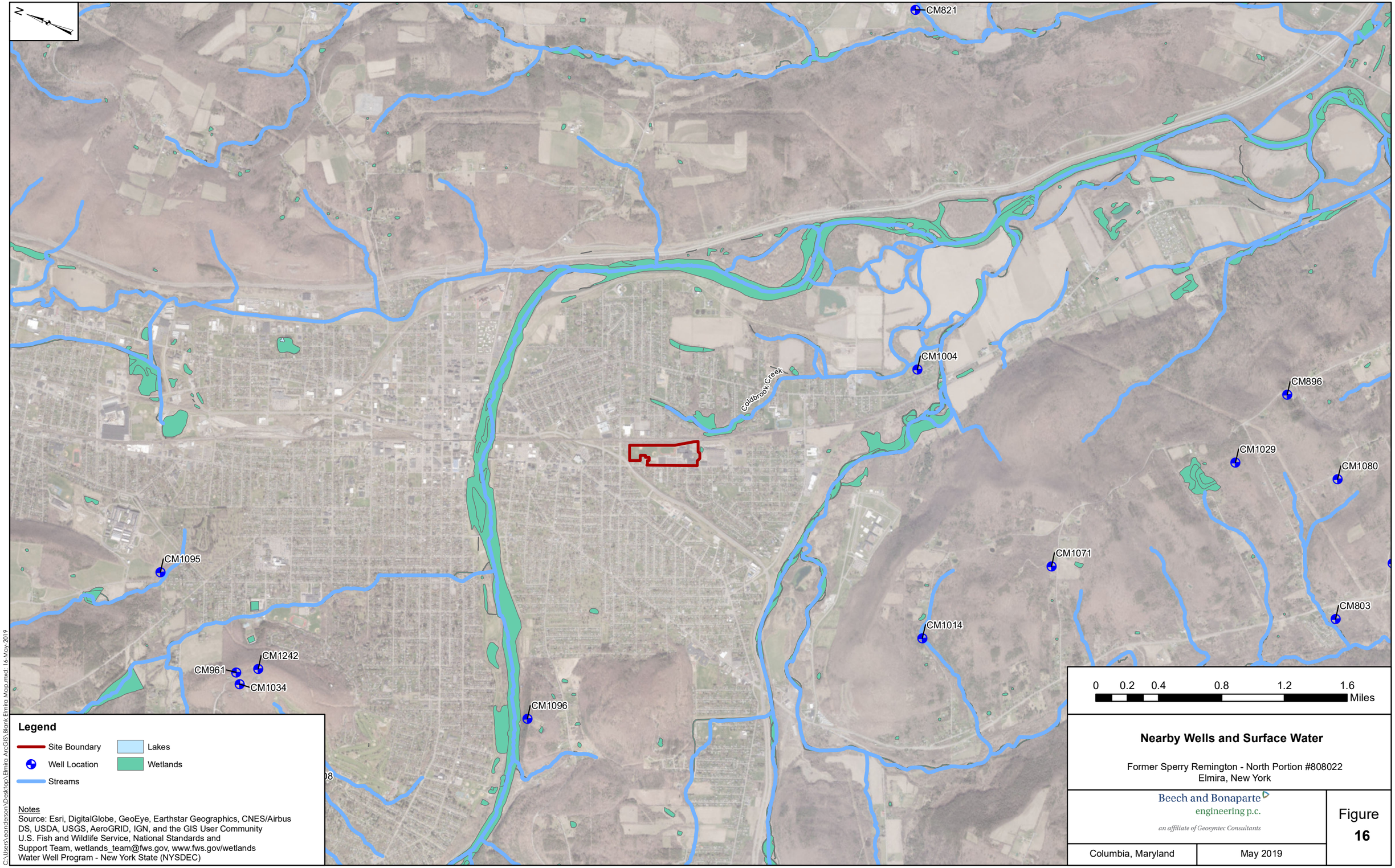

Nearby Wells and Surface Water

Former Sperry Remington - North Portion #808022
Elmira, New York

Beech and Bonaparte engineering p.c.
an affiliate of Geosyntec Consultants

Columbia, Maryland | May 2019

Figure **16**