PRE-DESIGN INVESTIGATION

WORK PLAN ADDENDUM

WORK ASSIGNMENT D009803-24.1

TONAWANDA FORGE SITE OPERABLE UNIT 1
SITE NO. 915274
2390 KENMORE AVE.
TOWN OF TONAWANDA
ERIE COUNTY, NY

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 Broadway, Albany, New York

Basil Seggos, Commissioner

DIVISION OF ENVIRONMENTAL REMEDIATION
Remedial Bureau E

AECOM USA, Inc.
One John James Audubon Parkway
Suite 210
Amherst, New York 14228

December 2021

Addendum to the Pre-Design Investigation Work Plan
at the Tonawanda Forge Site
Town of Tonawanda, New York 14150

Supplemental Sampling and Analyses to Address Data Gaps from the November 2020 Pre-Design Investigation at the Tonawanda Forge Site (ID #915274; Contract D009803, WA#24.1)

1.0 INTRODUCTION

This addendum to the *Pre-Design Investigation Work Plan (PDIWP) for the Tonawanda Forge Site, Tonawanda, New York 14150* (AECOM, November 2020) is designed to summarize the tasks that will be implemented during the supplemental sampling, analyses and reporting that will fill data gaps from the November 2020 Pre-Design Investigation. This PDIWP addendum will follow the companion Generic Field Activities Plan (FAP), Generic Quality Assurance Project Plan (QAPP), which are included as Appendices A and B of the original PDIWP, respectively. A revised site specific Health and Safety Plan (HASP) will also be followed. This revised HASP is presented as Appendix C.

2.0 SCOPE OF WORK

AECOM and our subcontractor team will complete a supplemental field investigation. This task includes an assessment and evaluation of additional environmental sampling and data requirements to complete the design and polychlorinated biphenyl (PCB) Cleanup Plan. The following work elements are included in this Task:

- Soil contamination delineation and environmental sampling of surface soils and impervious materials;
- Review of environmental sampling of concrete/bricks/non-porous surfaces impacted by former spills;
- Soil borings and soil sampling to refine the delineation of soil contamination per the United States Environmental Protection Agency's (USEPA) request;
- Sampling groundwater from all existing site monitoring wells and piezometers; and,
- Survey of new sampling locations.

2.1 Fieldwork

The locations of the solid samples are shown in Figure 1. The rationale for sampling solids (i.e., soils, impervious surfaces, etc.) is shown in Table 1.

The fieldwork will include the following subtasks.

<u>Impervious Surface Sampling</u>

- Collect 19 samples of concrete chip and brick chips exhibiting staining on surfaces not previously sampled around the site and analyze for PCBs by Method 8082A.

Groundwater Sampling

- Complete a synoptic round of groundwater levels from all monitoring wells and piezometers shown in Figure 2.
- All groundwater monitoring wells (49) and piezometers (14) will be sampled utilizing low flow procedures for PCB analysis by USEPA Method 608.3. Samples will be collected after purging a minimum of one well volume and the water quality parameters have stabilized. An unfiltered and a filtered (using a 0.45 micron filter) aliquot will be collected from each well. An additional filtered aliquot will be collected from each well for potential PCB homolog analysis. The PCB homolog aliquot will be held by the laboratory, pending results of the filtered sample analysis. Samples with dissolved PCB concentrations exceeding groundwater standards, criteria and guidance (SCG) will be analyzed for PCB homologs by USEPA Method 680.

Subsurface Soil Contamination Delineation

- Direct-push sample probes will be advanced to depths of up to 12 feet below ground surface (bgs) or the native clay interface at approximately 23 locations where further delineation is needed; and
- Up to four subsurface soil samples including one from the native clay interface in the western (industrial) portion will be collected from each sample probe for a total of approximately 46 primary samples. Every soil sample will be analyzed for TCL PCBs by Method 8082A. Representative samples collected from nine locations in and near AOC-01 will also be analyzed for TCL SVOCs by Method 8270D and arsenic by Method 6010D.

Surface Soil Contamination Delineation

- Surface soil samples be collected to depths of up to 0.5 feet bgs at approximately nine locations where further delineation is needed; and
- Every soil sample will be analyzed for TCL PCBs by Method 8082A. Representative samples collected from two locations in and near AOC-01 will also be analyzed for TCL SVOCs by Method 8270D and arsenic by Method 6010D.

Table 2 summarizes the sample analytical program and associated quality control samples. The bottles, volumes, preservatives and holding times for each sample is summarized in Table 3. New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) Category B (or equivalent) data deliverables will be provided by the laboratory for all analytical data. Analytical data will be validated and a Data Usability Summary Report (DUSR) will be included in AECOM's report deliverable (Section 2.2). Analytical services will be provided by a NYSDEC call-out laboratory.

All investigation-derived waste (IDW), including purge and decontamination water and soil spoils, will be drummed for disposal. Drums will be removed from the site after analytical results from the environmental sampling are received from the laboratory.

Engineering Survey

The location of all new impervious surface, direct-push probe, surface soil, and other environmental sample locations will be surveyed by a licensed surveyor. The survey will tie into the existing site survey and basemap.

2.2 Final Report

The July 2021 Pre-Design Report and August 2021 PCB Cleanup Plan will be modified to incorporate the additional investigation data and will be submitted as a draft report within 75 days after analytical data are received from the laboratory. A final version of the report will be submitted within 4 weeks after the NYSDEC's and USEPA's comments on the draft reports are received by AECOM. The report for this task will include the following:

- A description of field activities conducted on the site;
- Site maps depicting relevant site features;
- Figure(s) depicting soil probe borings, surface soil and impervious sample locations, and key site features;
- Figures depicting sample locations and NYS SCG non-compliance values from the soil and groundwater analytical data collected during site work;
- Data summary tables of detected compounds with NYS SCGs listed, and non-compliance values highlighted;
- A discussion of analytical results;
- Field notes and daily activity logs;
- Photographs taken at the site during field activities;
- Manifests and bills of lading signed by the disposal facility documenting the proper disposal of IDW;
- Survey field notes, site sketches, and drawings;
- The site basemap will be revised and will be used for the plans and specifications; and
- A DUSR containing only data from the additional fieldwork discussed above.

FIGURES

N

Legend

- Proposed Concrete Chip (PCBs Only)
- Proposed Soil Boring (PCBs and SVOCs)
- Proposed Surface Soil (PCBs and SVOCs)
- Brick
- Concrete Chip
- Wood Core
- Monitoring Well
- Geoprobe
- Soil Boring
- Surface Soil
- Test Trench
- Area of Concern

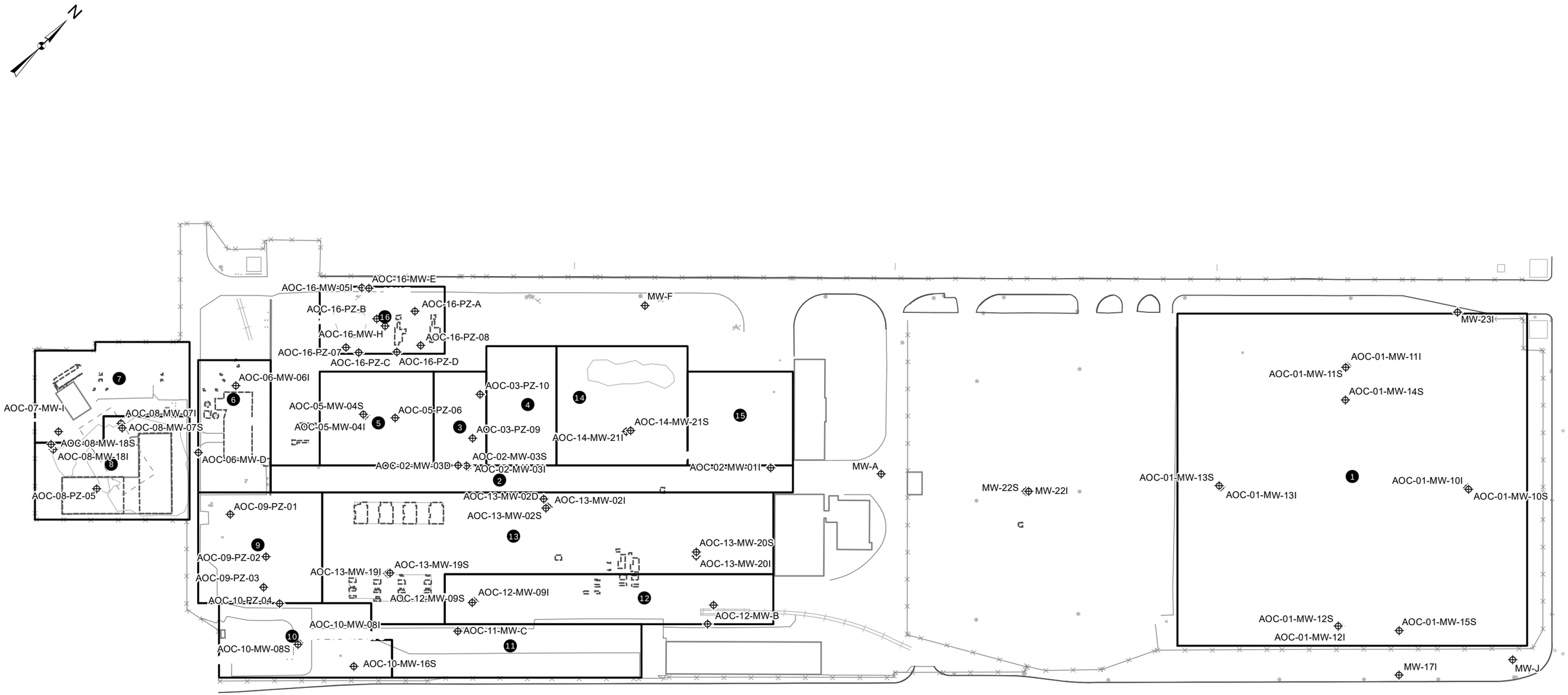
160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
PROPOSED PHASE II
PDI SAMPLE LOCATIONS

AECOM

FIGURE 1

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Legend

- Monitoring Well
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
MONITORING WELL LOCATIONS

AECOM

FIGURE 2

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TABLES

TABLE 1
TONAWANDA FORGE, SITE No. 915274
PRE-DESIGN INVESTIGATION WORK PLAN
NYSDEC WA D009803-24.1
PROPOSED PHASE II SAMPLING RATIONALE FOR SOLIDS

AOC	Name of AOC	Potential Sources / Releases	Most Likely Potential Mechanisms of Release	Evidence of PCB Release	Data Gap Assessment (PCBs)	Data Gap Assessment (SVOCs/Metals)	Proposed Soil Sample Locations	Default Soil Boring Sample Depths (feet bgs)	Rationale
A0C-1	ECM Area (Front Forty)	Industrial Landfill and vegetated areas north and south of parking area impacted with fill.	Contaminated fill	Elevated PCBs in fill materials within landfill and elevated arsenic and benzo(a)pyrene north and south of parking area.	Additional surface and subsurface soil data needed to determine horizontal and vertical extent of both surface and subsurface soils in vegetated areas north and south of parking areas.	Concentrations of arsenic and benzo(a)pyrene above industrial SCOs. Additional surface soil samples needed near SS-12 and additional subsurface soil samples in the vegetated areas north and south of parking lot.	9 soil borings, 2 Surface samples	0-0.5, 1-2, 2-3	Characterize soil beneath surface cover to better delineate extent of concentrations of PCBs, arsenic and benzo(a)pyrene above industrial SCOs.
A0C-2	Former PCB Spill Area	Damaged electrical transformer	Surface PCB spill from damaged electrical box	25 ppm PCBs at 3-4 feet bgs in central area. Impervious surface impacted with PCBs.	Three borings previously completed in the spill area with limited impacts and a couple other clean samples. Additional concrete samples needed to delineate extent of PCBs in impervious cover.	Delineation appears adequate.	2 surface samples. 7 additional concrete samples.	0 - 0.5 * See below for concrete	No likely sources outside of spill area and impacts in spill area are limited. Surface sample in area of spill to assess utility of surface cover as part of cap material.
A0C-3	Relay Rod Area	Oil pits, relay rod area, trenches	Surface contamination from trenches and oil pits.	PCB concentrations >25 in impervious cover.	Additional concrete samples needed to delineate extent of PCBs in impervious cover.	Delineation appears adequate.	1 concrete sample	* See below for concrete	Additional concrete sample needed to delineate extent of PCBs in impervious cover.
A0C-4	Machine Repair Area	Drains in machine and truck repair areas with oil	Surface spills, except possibly in sump in truck repair area	PCB concentrations >25 in impervious cover.	Additional concrete samples needed to delineate extent of PCBs in impervious cover.	Delineation appears adequate.	2 concrete samples	* See below for concrete	Additional concrete samples needed to delineate extent of PCBs in impervious cover.
A0C-5	Basement & Quench Oil Pump Pits	Backfilled oil pump pits.	Subsurface spill from oil pump pits and potentially contaminated backfill	PCB concentrations >25 in impervious cover.	Additional concrete samples needed to delineate extent of PCBs in impervious cover.	Delineation appears adequate.	1 concrete sample	* See below for concrete	Additional concrete samples needed to delineate extent of PCBs in impervious cover.
A0C-6	Waste Treatment Area, Sewer Lift Station & Waste Storage Area	Waste disposal AST	Surface spill from AST	PCBs detected in 2 of 12 samples at a maximum concentration of 3.2 ppm.	Limited evidence of PCB impacts in shallow samples. No evidence of deeper impacts.	Delineation appears adequate.	NA	NA	NA
A0C-7	Environmental Building (Former oil Pump)	Oil pump house UST and hazardous waste storage area	Surface spills from waste storage area.	PCBs detected in 8 of 10 samples with 5 results > 1 ppm. 17 ppm PCBs found at 4-4.5 feet bgs All other detections below 5 ppm.	No additional delineation needed.	Delineation appears adequate.	NA	NA	NA
A0C-8	Oil USTs / C&D Pile	UST and C&D debris pile	Surface from C&D material pile or subsurface spill from UST.	25 ppm PCBs found at 3'-4' depth	No additional delineation needed.	Delineation appears adequate.	NA	NA	NA
A0C-9	Railroad Spur & Soil Waste Accumulation Area	Railroad & soil waste accumulation area	Surface contamination from waste accumulation area. Surface release from railroad.	PCBs detected at concentrations greater than 1 ppm in 7 of 26 samples, all at depths of 1 to 5 feet bgs with a maximum concentration of 13 ppm. NAPL observed at northeast end of area with >100 ppm PCBs.	No additional delineation needed.	Delineation appears adequate.	NA	NA	NA

TABLE 1
TONAWANDA FORGE, SITE No. 915274
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NYSDEC WA D009803-24.1
PROPOSED PHASE II SAMPLING RATIONALE FOR SOLIDS

AOC	Name of AOC	Potential Sources / Releases	Most Likely Potential Mechanisms of Release	Evidence of PCB Release	Data Gap Assessment (PCBs)	Data Gap Assessment (SVOCs/Metals)	Proposed Soil Sample Locations	Default Soil Boring Sample Depths (feet bgs)	Rationale
A0C-10	Berm Area	Used oil AST, cutting-oil covered swarf materials	Surface spill, release from adjacent railroad spur to the northeast	Previous investigation and remediation of PCB-impacted soils. 48 ppm PCBs present from 1 to 1.5 feet bgs along southeastern edge of berm area.	No additional delineation needed.	Delineation appears adequate.	NA	NA	NA
A0C-11	Railroad Spur	Railroad equipment and materials	Surface spills/lateral migration from MH-59	PCBs detected in soil adjacent to MH-59.	Additional assessment of soil around MH-59 needed to ensure 25 ppm cleanup criterion met.	Additional delineation is needed near TP-08.	3 soil borings 3 surface samples	0-0.5, 1-1.5, 3-4, 11-12 (or native clay)	Delineate horizontal and vertical extent of PCB concentrations around TP-08 area.
A0C-12	Steel Yard	Steel yard, storage of swarf material.	Surface contamination from residual cutting oils on swarf.	PCBs detected in soil at SB-51-20 and SB-53-20.	Additional assessment of soil around SB-51-20 and SB-53-20 needed to ensure 25 ppm cleanup criterion met.	Additional delineation is needed.	2 soil borings	1-1.5, 2-3, 3-4, 11-12 (or native clay)	Delineate horizontal and vertical extent of PCB concentrations around SB-51-20 and SB-53-20.
A0C-13	Front Forge / Hot Formers	Substation, shears and presses and drains.	Surface releases from transformers, surface and subsurface releases from shears and presses.	PCBs detected in soil at 3.3-3.5 in TP-02. Elevated PCBs in concrete.	Additional assessment of soil around TP-02 needed to ensure 25 ppm cleanup criterion met. Additional concrete samples needed to delineate extent of PCBs in impervious cover.	Additional delineation is needed near TP-02, and surface impacts near central portion of the AOC.	5 Soil borings and 2 surface samples at boring locations. 5 additional surface soil samples to better delineate and characterize surface impacts. 7 additional concrete samples.	0-0.5, 1-1.5, 3.5-4, 4-5 and 11-12 (or native clay). *See below for concrete	Delineate horizontal and vertical extent of PCB concentrations around TP-02 area. Delineate extent of PCB surface soil impacts in central area of the AOC.
A0C-14	Former Die Room / C&D Pile	C&D pile Subsurface utilities	Surface spill, subsurface spill	Oily C&D pile removed in 2016. NAPL containing PCBs at 270 ppm identified in subsurface. PCBs > 25 ppm in impervious cover	Additional concrete samples needed to delineate extent of PCBs in impervious cover.	Delineation appears adequate.	Delineation appears adequate.	NA	NA
A0C-15	General Stores / Metal Lab Area	Laboratory, drill presses	Surface spill/subsurface spill from drill press sumps	PCB-containing wood block with black staining was observed within this area. Detection of 260 ppm PCBs along northwestern edge of area. PCBs > 25 ppm in impervious cover.	Additional concrete samples needed to delineate extent of PCBs in impervious cover.	Delineation appears adequate.	1 concrete sample	* See below for concrete	Additional concrete sample needed to delineate extent of PCBs in impervious cover.
Other	Loading Docks	Hydraulic lifts	Subsurface release of hydraulic oil possible.	No data exist.	No data exist.	Delineation appears adequate.	NA	NA	NA
Other	Net Gear Warehouse Area	Spills	Surface spill/subsurface spill	High PCBs detected at SF-16-20 beneath asphalt	Need additional data to delineate horizontal and vertical extent of PCB detection.	Delineation appears adequate.	4 soil borings	1-1.5, 3-4, 4-5, 11-12 (or native clay)	Delineate around PCB sample collected beneath asphalt that contained >100 ppm PCBs.
A0C-16	300 Ton Press & Cold Headers Area / C&D	Pile of C&D material, press	Surface spill from C&D pile. Release from press.	40 ppm detected in boring near former press.	No additional delineation needed.	Delineation appears adequate.	NA	NA	NA

Notes: ppm = Parts per million bgs = Below ground surface NA = Not applicable

* Surface samples for PCBs to be collected from 0 to 0.5 feet bgs in soil and 0 to 0.25 inches deep in concrete. Aliquots for SVOCs, TAL Metals, and Mercury to be collected between 0 and 2 feet. VOC aliquots to be collected at discrete 1 foot intervals.

All borings in the western (industrial) portion will be advanced to 12 feet below ground surface or native clay.

TABLE 2
TONAWANDA FORGE, SITE No. 915274
PRE-DESIGN INVESTIGATION WORK PLAN
NYSDEC WA D009803-24.1
PHASE II ANALYTICAL PROGRAM

Analysis	Number of Samples	Field Dup	MS	MSD	Total number of analyses
SURFACE SOILS					
Target Compound List (TCL) PCB by SW846 Method 8082	14	1	1	1	17
TCL SVOCs by SW846 Method 8270 (AOC-01)	2	0	0	0	2
Arsenic by SW846 Method 6010 (AOC-01)	2	0	0	0	2
SOIL BORINGS					
TCL PCB by SW846 Method 8082	71	3	3	3	80
TCL SVOCs by SW846 Method 8270 (AOC-01)	27	2	2	2	33
Arsenic by SW846 Method 6010 (AOC-01)	27	2	2	2	33
IMPERVIOUS SURFACE					
TCL PCB by SW846 Method 8082	19	1	1	1	22
GROUNDWATER					
TCL PCB by USEPA Method 608.3	62	3	3	3	71
Dissolved (filtered) TCL PCBs by USEPA Method 608.3	62	3	3	3	71
PCB Homologs by USEPA Method 680*	20	1	1	1	23

*The number of samples is estimated. Analysis will be performed only on dissolved phase samples exceeding groundwater SCGs.

MS/MSD - Matrix Spike/Matrix Spike Duplicate

TABLE 3
TONAWANDA FORGE, SITE No. 915274
PRE-DESIGN INVESTIGATION WORK PLAN
NYSDEC WA D009803-24.1
SAMPLE BOTTLE, VOLUME, PRESERVATION, AND HOLDING TIME SUMMARY

MATRIX/ANALYSIS	Analytical Method[1]	Sample Bottles				Minimum Vol Req'd	Preservation [2]	Holding Time [3]		Comment
		Material	Size	Qty	Source			Extraction	Analysis	
Soil Samples										
TCL PCBs	SW 846 8082A	G	4 oz	1	Lab	30 grams	None	14 days	40 days	
TCL SVOCs	SW 846 8270D	G	4 oz	1	Lab	30 grams	None	14 days	40 days	
Metals (Arsenic)	SW 846 6010D	G or HDPE	4 oz	1	Lab	10 grams	None	6 months	6 months	
Impervious Surface Samples										
TCL PCBs	SW 846 8082A	G	4 oz	1	Lab	30 grams	None	14 days	40 days	
Aqueous Samples										
TCL PCBs (total)	USEPA 608.3	G	1L	2	Lab	1L	None	7 days	40 days	
TCL PCBs (dissolved)	USEPA 608.3	G	1L	2	Lab	1L	None	7 days	40 days	filtered at collection with 0.45 micron in-line filter
PCBs Homologs (dissolved)	USEPA 680	G	1L	2	Lab	1L	pH 2-3, H_2SO_4	1 year	1 year	filtered at collection with 0.45 micron in-line filter

(1) More recent versions of analytical methods may be used subject to NYSDEC ELAP certification and approval.

(2) All samples for chemical analysis should be held at 4 degrees C in addition to any chemical preservation required.

(3) Holding time calculated from day of collection, unless noted as being from time of extraction. Holding time for analysis is from the date of extraction. It should be noted that the extraction holding time for Method 680 is 7 days from collection. However, due to the persistent nature of PCBs, the holding time requirements from USEPA Method 1668A - Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by HRGC/HRMS and Method 1628 - Polychlorinated Biphenyl (PCB) Congeners in Water, Soil, Sediment, Biosolids, and Tissue by Low-resolution GC/MS using Selected Ion Monitoring is being applied.

G = Amber Glass HDPE = High-density polyethylene

SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. USEPA SW-846. Complete through Update IV, March 2009.

APPENDIX C
Site Specific Health and Safety Plan
December 2021 Update

Avalable Upon Request

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

PRE-DESIGN INVESTIGATION

WORK PLAN

WORK ASSIGNMENT D009803-24

TONAWANDA FORGE SITE OPERABLE UNIT 1 NO. 915274
2390 KENMORE AVE.
TONAWANDA (T), ERIE COUNTY, NY

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 Broadway, Albany, New York

Basil Seggos, Commissioner

DIVISION OF ENVIRONMENTAL REMEDIATION
Remedial Bureau E

AECOM USA, Inc.
257 West Genesee Street
Suite 400
Buffalo, New York 14202

November 2020

TONAWANDA FORGE SITE
OPERABLE UNIT 1
SITE NO. 915274
ERIE COUNTY, NEW YORK

PRE-DESIGN INVESTIGATION WORK PLAN
WORK ASSIGNMENT D009803-24

Prepared for

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION
625 BROADWAY, 12th FLOOR
ALBANY, NEW YORK 12233-7017

Prepared by

AECOM USA, INC.
257 WEST GENESEE STREET
SUITE 400
BUFFALO, NY 14202-2657

NOVEMBER 2020

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Plate 2	RI Sampling Locations

APPENDICES

Appendix A	Generic Field Activities Plan
Appendix B	Generic Quality Assurance Project Plan
Appendix C	Site Specific Health and Safety Plan
Appendix D	Immunoassay Results

LIST OF ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
AECOM	AECOM USA, Inc.
AHERA	Asbestos Hazard Emergency Response Act
AAM	American Axle & Manufacturing
AOC	Area of Concern
AST	Aboveground Storage Tank
BB&L	Blasland, Bouck, & Lee, Inc.
bgs	below ground surface
C&D	construction and demolition
CB	catch basins
CFR	Code of Federal Regulations
cm	centimeters
cm^2	square centimeters
CRA	Conestoga-Rovers & Associates
cy	cubic yards
DER	Division of Environmental Remediation
DO	dissolved oxygen
Drawings	Remedial Construction Contract Drawings
DUSR	Data Usability Summary Report
ECM	Erosion Control Measure
ESA	Environmental Site Assessment
ELAP	Environmental Laboratory Approval Program
FS	Feasibility Study
GES	Groundwater Environmental Services)
g/kg	grams per kilogram
GM	General Motors
GM ER & IES	GM Worldwide Facilities Group, Environmental Remediation and International Environmental Support
gpm	gallons per minute
IDW	investigation-derived waste
IRM	Interim Remedial Measure
IW	industrial waste
IWTP	Industrial Waste Treatment Plant
mg/kg	milligrams per kilograms
µg/L	micrograms per liter
mg/L	milligrams per liter
LNAPL	Light Non Aqueous Phase Liquid
MH	manhole
MS4	Municipal Separate Storm Sewer System
NYCRR	New York Codes, Rules and Regulations,
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOL	New York State Department of Labor
OSHA	Occupational Safety and Health Administration
OD	outside diameter
OM&M	Operation, Maintenance and Monitoring

ORP	oxidation reduction potential
OU	operable unit
PCB	polychlorinated biphenyl
PDIWP	Pre-Design Investigation Work Plan
PLM	polarized light microcopy
POTW	publicly owned treatment works
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
ROD	Record of Decision
ROI	radius of influence
ROW	rights-of-way
SACM	Suspect Asbestos Containing Materials
SCG	standards, criteria, and guidance value)
SCO	Soil Cleanup Objective
SGV	Sediment Guidance Values
SPDES	State Pollution Discharge Elimination System
SSAs	storm sewer areas
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristics Leaching Procedure
TEM	transmission electron microscopy
TOGS	Technical and Operational Guidance Series
TSCA	Toxic Substances Control Act
TSS	total suspended solids
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION

This Pre-Design Investigation Work Plan (PDIWP) presents the design rationale, criteria, and analysis for a remedial design at Operable Unit Number 1 (OU1) of the Tonawanda Forge Site (Site No. 915274) located in Tonawanda, New York (Figure 1). This document presents the scope, site background, approach, and description of the remedial alternative selected for remediation of OU1 in accordance with the New York State Department of Environmental Conservation (NYSDEC) Amended Record of Decision (ROD) dated March 2020. This PDIWP includes a companion Generic Field Activities Plan (FAP), Generic Quality Assurance Project Plan (QAPP), and a site specific Health and Safety Plan (HASP), which are included as Appendices A through C, respectively.

1.1 Site History and Background

The Tonawanda Forge Site (Site) is located in Tonawanda, Erie County, New York (Figure 1). The Site is listed as a Class 2 Inactive hazardous waste site; Site No. 915274 in the New York State Registry of Hazardous Waste Sites. The 34.8 acre Site is zoned for industrial use and is approximately 2,300 feet southeast of the intersection of Kenmore Avenue and Sheridan Drive. The site contains 2 parcels. Parcel 1 is 33.2 acres. Parcel 2 (AOC-7 and AOC-8) is 1.6 acres. The Site is relatively flat and primarily covered with asphalt, concrete and former building foundations and four buildings. The eastern portion of the Site, identified as (Area of Concern) AOC 1, is a grass covered landfill with an elevation approximately 6 feet above the surrounding grade. AOC-1 is also referred to as the "Front Forty".

The Site has areas of standing water following precipitation and snow melt. The standing water is the result of previous plugging of the storm sewer system at downgradient locations to inhibit the flow of contamination offsite. As part of previous work activities, a number of manholes, catch basins, and some sewer line sections have been plugged at several locations across the Site. As a result, water ponds in several areas following rain events or snow melt.

The property was originally part of the GM-Tonawanda Engine Plant (GM-Tonawanda) facility that borders the Site to the north, west, and south. The property originally consisted of four separate on-site buildings: 1) Forge building; 2) Heat Treating building; 3) Maintenance/Die Shop building; and 4) Office building. Over time, the Forge building, Heat Treating building, and Maintenance/Die Shop building were combined under a common roof into one building where the manufacturing operations were performed. Over the operational history of the facility, additional buildings were added at the Site, including an Oil Pump House (aka: Environmental Building), Cafeteria/Locker room, Air Compressor building, Maintenance Storage Facility, and Net Shape Gear Warehouse. A historical site plan is shown on Figure 2.

In 1994, GM sold the Site to American Axle & Manufacturing (AAM) who performed the forging and manufacturing of automotive parts at the Site. In 2008, AAM sold the Site to the current owner, Lewis Brothers, LLC (Lewis), of Richmond, Virginia. Upon sale of the Site, Lewis began the demolition of the Site buildings that formerly housed the manufacturing operations, starting with the removal of the interior equipment and ending with the removal of the buildings' entire superstructure.

Upon the owner's refusal to address petroleum contamination on the Site in violation of a stipulation agreement with the NYSDEC, the NYSDEC proceeded with remediation of contamination under Spill Site number 0944809. During demolition there was a release of polychlorinated biphenyls (PCBs) from two transformers on December 19, 2011. Upon the Owner's refusal to address the spill the NYSDEC instituted clean-up procedures under Spill Site number 1112690.

Currently, the only structures remaining on the Site are the Office building, Cafeteria/Locker room, Environmental Building, and Net Shape Gear Warehouse. The majority of the western portion of the Site consists of former building floor slabs, parking lots, and driveways. A large grassed area in the eastern part of the Site, bordered by Kenmore Avenue, is a former fill and disposal area that was re-graded and capped. This area, commonly known as the "Front Forty", was designated as AOC-1 during the Remedial Investigation.

1.1.1 Areas of Concern Descriptions

Based upon a review of historic documents, drawings, and previous investigations, sixteen potential Areas of Concern (AOCs) were identified at the Site (see Figure 3A). The sewer network (Plate 1), which includes storm water, sanitary, and industrial waste (IW) lines and ducting, was also investigated. Each AOC and the sewer network were investigated to determine if historic activities at the Site and/or releases of PCBs during Site demolition activities by the property owner have adversely impacted the environment. A description and rationale for each AOC and the sewer network is given below.

AOC-1: ECM Area (i.e., Front Forty)

AOC-1 consists of the Front Forty located between Kenmore Avenue and the main parking lot and originally contained railroad spurs. Aerial photographs indicate that dumping/grading activity appears to have been performed in the vicinity of the railroad spurs. Between 1998 and 2000, GM installed sewer bulkheads and instituted an Erosion Control Measures (ECM) to prevent PCB-impacted soils and sediment from entering the storm sewer system. The ECM activities included regrading and capping PCB-impacted soils. The presence of PCB-impacted soils in the Front Forty has been documented by BB&L (BB&L, December 1998) and GES (GES, October 2012). Remedial investigation (RI) field activities were conducted in AOC-1 to determine the potential sources of the PCBs detected in the soils and to investigate the potential impacts of PCBs to groundwater beneath the AOC.

AOC-2: Former PCB Spill and Affected Area

AOC-2 consists of the main corridor that runs the length of the former Forge building. The surface of AOC-2 was impacted by a PCB oil spill from damaged electrical transformers during the demolition of the building. RI field activities were conducted in AOC-2 to investigate the potential impacts of the PCB oil spill and historic activities to the brick and concrete surface, soils, and groundwater within/beneath the AOC.

AOC-3: Relay Rod Area

AOC-3 consists of the former relay rod area that had oil pits and trenches throughout the area. Manholes and piping in the relay rod area historically had PCB detections prior to the PCB transformer spill in December 2011. RI field activities were conducted in AOC-3 to investigate the potential impacts of historic activities to the concrete surface, soils, and groundwater within/beneath the AOC.

AOC-4: Truck Repair/Maintenance

AOC-4 consists of the former truck repair/maintenance area (formerly the Electrical Crib). Previous maintenance activities performed in AOC-4, when it was used as the Electrical Crib, may be the source of detections of PCBs in oil, sludge, and water samples collected by AAM in July 1998. A sample collected by GES from a sump in the truck repair/maintenance area contained concentrations of PCBs greater than 50 mg/kg. RI field activities were conducted in AOC-4 to investigate the potential impacts of historic activities to the concrete surface, soils, and groundwater within and beneath the AOC.

AOC-5: Basement & Quench Oil Pump Pits

The AOC-5 consists of an area that was used as the heat treatment area and formerly contained a basement and quench oil pump pits. Due to the heat treating operations that were performed in AOC-5, there is a potential for petroleum impacts to the soils and groundwater underneath the AOC. The former basement and quench oil pump pits were backfilled and covered with concrete at some time during the operation of the Site by GM or AAM, prior to the demolition of the Forge building. It is unknown if the basement and quench oil pump pits were cleaned prior to backfilling or the type of the material used for backfilling. RI field activities were conducted in AOC-5 to investigate the potential impacts of historic activities to the concrete surface, soils, and groundwater within/beneath the AOC.

AOC-6: Waste Treatment Area, Lift Station, & Waste Storage Area

AOC-6 contains the waste treatment area, sanitary sewer lift station, and a waste storage area. The waste treatment area was used to treat the IW collected in various trenches and pits and conveyed to the waste treatment area via overhead piping. IW was discharged from the overhead piping into an oil/water separator containing two basins. The north basin was the first chamber where oil/graphite was skimmed off; the south basin was the second chamber that went to the sanitary sewer lift station. An active skimmer was used to remove oil/graphite (the skimmer is still present) which was then transferred to the two, approximately 1,500 gallon aboveground storage tank (ASTs) located to the south of the second chamber. After exiting the second chamber, the effluent entered the lift station and was then conveyed to the sanitary sewer system. The ASTs and associated piping are covered with potential asbestos-containing material (ACM). The area south of the ASTs contains a concrete pad equipped with drains and was used to store drums of oil and other wastes. RI field activities were conducted in AOC-6 to investigate the potential impacts of historic activities to the concrete surface, soils, and groundwater within/beneath the AOC. An inspection and sampling of the two ASTs within AOC-6 was also performed.

AOC-7: Environmental Building (Former Oil Pump House)

AOC-7 consists of the Environmental building. This building was the former oil pump house associated with the underground storage tank (UST) farm located in AOC-8. The building later housed hazardous waste and includes exterior areas located to the east, west, and north of the building where drum storage took place. A spill pad/bermed area is located on the northwest side of building. RI field activities were conducted in AOC-7 to investigate the potential impacts of historic activities to the soils and groundwater within and beneath the AOC.

AOC-8: Oil USTs/C&D Pile

AOC-8 consists of the area that formerly contained up to 18 25,000-gallon USTs. At the time of the Phase I RI, most of the area was covered by a 4,000 cubic yard (cy) pile of construction and demolition (C&D) debris up to 15 feet high. An aerial photograph shows the former presence of an Air Compressor building and a Maintenance Storage Facility building over portions of the former tank farm area. A review of the EDR Radius Search indicated that 13 24,722-gallon USTs were decommissioned and removed from the Site in February 1991. It is likely that these 13 USTs were located in AOC-8.

RI field activities were conducted in AOC-8 to investigate the potential impacts of historic activities to the soils and groundwater within and beneath the AOC. The Phase I RI field activities during were limited due to the presence of the 4,000 cy pile of C&D debris. The C&D debris pile was removed between October 12, 2015 and February 9, 2016 as part of the interim remedial measure (IRM) performed by The Environmental Services Group (NY), Inc. (ESG) under New York State Contract No.D009634.

AOC-9: Railroad Spur & Solid Waste Accumulation Area

AOC-9 consists of the area that formerly contained a railroad spur and used to store equipment. Investigations in this area by CRA and AAM (CRA, November 2000) indicated the presence of PCBs in subsurface soils. RI field activities were conducted in AOC-9 to investigate the extent of known PCB impacts to the soils and groundwater within/beneath the AOC.

AOC-10: Berm Area

AOC-10 consists of a berm area that contained two sloped concrete berms with a barrier wall, drain, pump house, and a used oil AST. The purpose of the berm area was to facilitate the collection of oil from machinery and swarf. After oil was collected, it was pumped into the AST pending disposal.

GM performed an excavation of this area in 1998 (BB&L, December 1998) to remove PCB-impacted soils. In addition, an investigation by CRA of the former railroad lines and railroad spurs located to the south and north of AOC-10, respectively, indicated the presence of PCBs in subsurface soil down to 12 feet below ground surface (bgs) (CRA, November 2000). RI field activities were conducted in AOC-10 to investigate the extent of known PCB impacts to the soils and the potential impacts to groundwater within and beneath the AOC.

AOC-11: Railroad Spur

AOC-11 consists of the location of a former railroad spur located along the southern property line. Investigations in this area by CRA and AAM (CRA, November 2000) indicated the presence of PCBs in surface and subsurface soils. RI field activities were conducted in AOC-11 to investigate the extent of known PCB impacts to the soils within and beneath the AOC.

AOC-12: Steel Yard

AOC-12 consists of the former steel yard where steel was unloaded and stored prior to being used in the forging process. Previous investigations indicated that the presence of PCBs in subsurface soils (BB&L, December 1998) was attributed to the historic storage of swarf material in the area in the vicinity of MH-52. RI field activities were conducted in AOC-12 to investigate the extent of known PCB impacts to the soils and potential impacts to groundwater within and beneath the AOC.

AOC-13: Front Forge/ Hot Formers

AOC-13 consists of the area that formerly contained the front Forge area and hot former pit. Samples of oil collected by GES from this area indicated the presence of PCBs (GES, October 2012). PCBs were detected in samples collected from the IW lines, hot former pits, and catch basins during sampling conducted in July of 1998 (BB&L, June 1999). RI field activities were conducted in AOC-13 to investigate the extent of PCB impacts to the soils and potential impacts to groundwater beneath the AOC.

AOC-14: Former Die Room/C&D Pile

AOC-14 consists of the area that formerly contained the die room. A 700 cy milled pile of C&D material was located in this AOC. URS observed a black oily substance oozing from the base of the C&D pile and a sheen was present on standing water adjacent to the black oily substance. RI field activities were conducted in AOC-14 to investigate the potential impacts of historic activities to the surface within the AOC. The Phase I RI field activities during were limited due to the presence of the 700 cy pile of C&D debris and the presence of standing water over a majority of the AOC surface. The C&D debris pile which included the

bulk solid material sampled during the Phase I RI was removed between October 12, 2015 and February 9, 2016 as part of the IRM performed by ESG under New York State Contract No.D009634.

AOC-15: General Stores/Metal Lab Area

AOC-15 consists of the area that formerly contained the metal lab and a general storage area. During a URS visit to the property on July 30, 2013, suspected PCB-containing wood block was observed within this area, as was a black oily substance on the surface. RI field activities were conducted in AOC-15 to investigate the potential impacts of historic activities to the surface and soils within and beneath the AOC.

AOC-16: 300 Ton Press & Cold Headers Area/C&D Pile

AOC-16 consists of the area that formerly contained the 300 ton press and cold headers. A 200 cy pile of C&D material occupied the northwest corner of AOC-16. Soil samples collected by GES from within AOC-16 contained concentrations of PCBs greater than 50 mg/kg (GES, October 2012). During a URS visit to the property on July 30, 2013, four piezometers (PZs) and one monitoring well were noted in AOC-16. These piezometers were not previously identified by GES.

During the July 2013 Site visit, significant staining was noted on the concrete surface. RI field activities were conducted in AOC-16 to investigate the extent of known PCB impacts to the soils and potential impacts to the concrete and groundwater within/beneath the AOC. The Phase I RI field activities in the AOC were limited due to the presence of the 200 cy pile of C&D debris in the northern/northwestern portion of the AOC. The C&D debris pile was removed between October 12, 2015 and February 9, 2016 as part of the IRM performed by ESG under New York State Contract No.D009634.

1.2 Previous Site Work and Investigations

1.2.1 Blasland, Bouck, & Lee, Inc. – December 1998

In December 1998, Blasland, Bouck, & Lee, Inc. (BB&L) submitted the Interim Corrective Measures Letter Report - Addendum I, American Axle & Manufacturing (AAM) Tonawanda, NY Forge Plant (BB&L, December 1998) to the NYSDEC – Region 9 on behalf of General Motors (GM) Worldwide Facilities Group, Environmental Remediation and International Environmental Support, of Detroit, Michigan (GM ER & IES). The report summarized the results of an investigation and the corrective actions taken to address possible sources of PCBs in the AAM storm sewer system. Sewer system manhole locations can be found on Plate 1.

The following activities were performed at the Site as part of the investigations and corrective actions: historical records were reviewed in an attempt to determine potential sources of PCBs in the storm water; a soil investigation conducted in the vicinity of portions of the storm sewer system and manholes (MH); storm sewer cleaning was performed; portions of the sewer system were retrofitted; a storm sewer video inspection was performed; and storm sewer sampling events were conducted during the months of October, November, and December 1998. Results of these activities are discussed below.

An October 1998 storm sewer sampling indicated that PCB concentrations in storm water were not related to non-contact cooling water but were possibly the result of sediment and residue present in the piping.

A soil investigation was performed along the previously identified compromised storm sewer lines beneath the Forge area (i.e., manholes MH-51, MH-52, and MH-53) and beneath the southern access road (i.e., manholes MH-58, MH-59, and MH-60). The area in the vicinity of MH-52 had historically been used for the storage of swarf materials (i.e., metal turnings, cuttings, grindings, and chips, usually covered with cutting oil). The investigation indicated the presence of PCBs in subsurface soils.

A November 1998 sewer pre-cleaning sampling event was performed. Results indicated the primary areas of concern appeared to be at manhole locations MH-53-2, MH-53-3, MH-56, and MH-64. Storm sewer cleaning was performed between November 12 and 25, 1998 along 37 sewer intervals. A post-cleaning video inspection was made and several cracks and collapsed sections of piping were identified.

Between November 12 and 25, 1998, sewer lines deemed unnecessary were removed from the storm sewer system by installing bulkheads. The majority of the bulkheads installed were within the catch basins (CBs) located in the "Front Forty", which is the term for the approximately 7.5 acres of undeveloped area that was located between Kenmore Avenue and the main parking lot. A post-cleaning sewer sampling event was performed in December 1998 and indicated that concentrations of PCBs in the AAM storm sewer system had been significantly decreased.

1.2.2 American Axle & Manufacturing – April 15, 1999

On April 15, 1999, AAM submitted a letter titled AAM Industrial Waste System (AAM, April 15, 1999) to the NYSDEC – Region 9. The letter indicated that AAM had performed cleaning and inspections of two IW lines running the length of the Forge building. The cleaning included associated manholes, the hot former pits, and catch basins.

The results of a March 1999 sampling event indicated two sample locations from the IW lines, associated manholes, hot former pits, and catch basins with elevated PCBs (CB @ S-23 and IWP-HF#4).

1.2.3 Blasland, Bouck, & Lee, Inc. – June 1999

In June 1999, BB&L submitted the Interim Corrective Measures Letter Report - Addendum II, American Axle & Manufacturing Tonawanda, Tonawanda Forge Plant, Tonawanda, New York (BB&L, June 1999). The report summarized the storm sewer and industrial cleaning activities, storm sewer sampling, bulkhead installation, and inspection and repairs recommended and performed since the Addendum I report was submitted by BB&L in December 1998. The report covers the time period of December 1998 through March 1999.

In December 1998, storm sewer lines between manholes MH-58, MH-59, and MH-60 and MH-83 and MH-84 were cleaned and video inspected following the cleaning. Previous sampling events had detected PCBs in these manholes and video inspections had shown compromises to the storm sewer lines.

Additional bulkheads were installed in manholes and sewer lines within both the Forge area and the Front Forty between December 1998 and February 1999.

A storm sewer sampling event was performed in February 1999 to evaluate the results of the December 1998 cleaning event. Post-cleaning sampling indicated that PCBs were present in water from storm sewer lines between manholes MH-51 through MH-53 and MH 58 through MH-60. The source of the PCBs was suspected to be from damaged sewer lines being impacted by surrounding PCB-containing soils. In addition, a review of plant drawings by BB&L indicated that some manholes were connected to laterals

from roof conductors used to convey rainwater from the roof to the storm sewer system. PCB-containing transformers and electrical substations located on the roof in the vicinity of the roof conductors were identified as potential sources of PCBs.

The results of repeated cleaning, video inspection, and storm sewer sampling events identified six storm sewer areas (SSAs) as potential sources of PCBs.

BB&L performed an engineering study to determine potential repair/replacement methods for some of the impacted sewer lines. Additional investigations were proposed for the remaining sewer lines.

In the report, BB&L summarized the following remedial activities performed at the Site by AAM:

- During December 1998, AAM performed cleaning and inspections of two IW lines, the hot former pits, and catch basins (currently identified as AOC-13) which had been used to collect industrial waste generated during the forging process. The cleaning performed in December 1998 was in response to PCBs being detected in samples collected from the IW lines, hot former pits, and catch basins during sampling conducted by AAM in July of 1998. Although the IW lines, hot former pits, and catch basins were not suspected as potential sources of PCBs to the storm sewer, they were cleaned to eliminate possible PCB sources to AAM's Industrial Waste Treatment Plant (IWTP) because the IW lines were connected with overhead piping within the Forge to the IWTP.

- Three IW catch basins located in the truck repair area (formerly the Electrical Crib, currently identified as AOC-5) were used to contain used motor oils and lubricants. The three IW catch basins were connected with overhead piping within the Forge to the AAM IWTP. BB&L concluded that previous maintenance activities performed in the Electrical Crib may have led to detections of PCBs in oils, sludges, and wastewater samples collected by AAM in July 1998. The cleaning activities performed on the IW lines, hot former pits, and catch basins reduced PCB-containing oils and sludges from the IW system.

1.2.4 Conestoga-Rovers & Associates – November 2000

In November 2000, Conestoga-Rovers & Associates (CRA) submitted a report to GM ER & IES titled the *Historic and Active Railroad Drainage Line Subsurface Investigation,* Powertrain Group, Tonawanda Engine Plant, Tonawanda, New York (CRA, November 2000). The report summarized an investigation of the railroad drainage lines at the GM-Tonawanda facility that was performed to determine if they were a contributing source of PCBs to the storm water discharge to State Pollution Discharge Elimination System (SPDES)-permitted Outfall 001. The railroad drainage lines are tied into the storm water sewer system. The report also provided a summary of the site background with regard to railroad drainage lines and past site activities which included the Site.

Between March 8, 1999, and April 6, 1999, 296 direct push soil borings were advanced along existing and historical railroad tracks. Soil samples were collected from the ground surface to 12 feet bgs and screened for PCBs using EnviroGard® Immunoassay PCB in Soil Test Kits. The PCB screening consisted of a comparison between the samples and the PCB standards at concentrations of 1 part per million (ppm), 5 ppm, 10 ppm, and 50 ppm. Approximately 5 percent of the samples collected were sent off-site for confirmation analytical testing for PCBs by USEPA Method 8082. Immunoassay results shown in Appendix D.

Soil sample results indicated the presence of PCBs with concentrations greater than 50 ppm in soils at depths down to 12 feet bgs along the property line in the southwest corner of the Site. The maximum concentration of PCBs in samples sent off-site for confirmation analytical testing was 180 ppm.

Soil sample results also indicated the presence of PCBs with concentrations greater than 50 ppm in areas of compromised sewer system lines in the Forge area, southern access road, and along the former railroad spur located along the Site's southern property line.

1.2.5 Blasland, Bouck, & Lee, Inc. – October 2001

In October 2001, BB&L submitted a report titled Interim Corrective Measures Letter Report - Addendum III, American Axle & Manufacturing, Tonawanda Forge Plant, Tonawanda, New York (BB&L, October 2001) to the GM ER & IES. The report summarizes the results of an additional storm sewer assessment, an investigation of the Front Forty area, and the implementation of ECMs in the Front Forty area.

Various investigations related to the presence of PCBs in the storm sewers were performed in 1999. PCB-containing transformers were known to be present on the roof of the AAM facility. Sampling was performed on the roof of the AAM facility to determine if the roof was a source of PCBs that were being carried by rainwater via roof conductors, to the storm sewer. Analytical results indicated the presence of PCB concentrations ranging from 0.14 micrograms per liter (µg/L or parts per billion [ppb]) to 1.09 µg/L. It was determined that the roof was a contributing source of PCBs to the storm sewers.

In February, August, and September 1999, sampling was conducted to determine if the Front Forty was a potential source of PCB-impacted sediment-laden runoff. Analytical results indicated a contribution of PCBs to the storm sewer system from runoff originating from the Front Forty.

In October 1999, a PCB/suspended solids study was performed to identify potential sources of the PCBs observed in storm water in relation to suspended solids, oil and grease, and changes in weather. BB&L concluded that PCB detections were associated with PCBs adsorbed to suspended solids and not dissolved PCBs in the water or in oil and grease. Also, BB&L concluded that rainfall and wind conditions may have impacted the total suspended solids (TSS) and turbidity resulting in elevated PCBs detections in storm water.

An ECM was implemented in the Front Forty between March and October 2000 to reduce PCB storm water issues in SSA-3 and SSA-4, which are located along the northern Site boundary and in the main parking lot, respectively. In May 2000, six percolation test pits were excavated in the Front Forty to assess the potential for the subsurface soils to percolate or retain water. A 1- to 2-foot thick fill layer was encountered over a clay layer and no water was encountered. It was determined that the soils below the fill layer had minimal percolation capacity. In May and June 2000, 57 direct push soil borings were advanced. Soil samples were collected until native material was encountered. The fill was encountered down to 8 feet bgs. Soil samples of the fill material were field screened with EnviroGard® Immunoassay PCB in Soil Test Kits. Results indicated the presence of PCBs in the fill material at concentrations greater than 50 ppm at depths down to 6 feet bgs. Soil samples were not collected from the native material found below the fill material. Immunoassay results are shown in Appendix D.

The implementation of the Front Forty ECM was performed between March and October 2000. The ECM activities included:

- A pre-construction topographic survey and two subsequent construction surveys to establish grade control for earthwork activities.
- The leveling of existing on-site soil and C&D debris piles. The C&D piles were consolidated and buried below final grade.
- An area of slag was excavated, crushed and re-graded within the Front Forty.
- Approximately 3,413 cubic yards (cy) of Type S1 common fill was imported, placed and compacted to achieve necessary design elevations. The Type S1 consisted of a dark brown sandy silty clay soil.
- A perimeter berm was constructed using a combination of on-site soil and imported Type S1 fill.
- A stone-lined low area was constructed. On-site excavated soils from the stone-lined low area were used to construct the eastern berm on the Front Forty.
- An earthen spillway was constructed along the northern berm to allow for drainage of storm water runoff from the Front Forty into manhole MH-85. The spillway invert and side slopes were lined with erosion control matting and the surfaces downstream of the invert were lined with riprap underlain with geotextile fabric.
- Approximately 5,650 cy of topsoil was imported, and a 4-inch thick lift was placed over the Front Forty area.
- A maintenance access road and turn around were constructed in the northwest corner of the Front Forty.
- The topsoil was hydro seeded.
- Erosion control matting was installed on the side slopes of the perimeter berm and along the centerline of the drainage swales.

Between August and October 2000, storm sewer cleaning was performed in SSA-3 and SSA- 4 to address sediments and debris related to the Front Forty. In addition, select storm sewer lines and the inlet formerly associated with the Front Forty were abandoned in-place. Post-ECM storm sewer sampling indicated that the ECM implemented in the Front Forty was successful in reducing PCB impacts to the storm sewer.

1.2.6 Blasland, Bouck, & Lee, Inc. – November 2004

In November 2004, BB&L submitted a report titled *2002 Investigation and Response Activities Summary Report, American Axle & Manufacturing Tonawanda, NY Forge Plant* (BB&L, November 2004) to the GM ER & IES. The report summarized the results of an additional storm sewer investigation and storm sewer response activities completed in 2002.

A storm water sampling program was conducted during May 2002. Between May 10 and May 17, 2002, 144 samples were collected from seven locations. Storm water sampling results indicated that the average concentration of PCBs was 0.040 µg/L, with a maximum PCB concentration of 0.32 µg/L at manhole MH-55.

As part of the storm sewer response activities, an 8-foot section of collapsed pipe located near manhole MH-52 was repaired. This repair was made to reduce the amount of PCB-impacted soil surrounding the pipe entering the storm sewer system. In addition, the manhole was raised by approximately 4 inches and a solid manhole cover installed to reduce any PCB-impacted soil from entering the manhole. Due to the observation of oil in manhole MH-58, in June 2002 manhole MH-58 was cleaned, select laterals were abandoned, and a sealant was applied to the inside of the manhole. The purpose of the sealant was to mitigate the seepage of oil into the manhole from surrounding soils.

Storm sewer cleaning and videotaping was performed in July 2003. The purpose was to remove potentially PCB-impacted sediments and debris from the storm sewer lines. During the video inspection the following observations were made:

- Some production-related material entered MH-57 from an extruder machine;
- Several cracks in pipe sections were noted between MH-51 to MH-52, MH-58 to MH-59, and MH-59 to MH-60;
- Moderate staining was noted between MH-59 and MH-60;
- Hardened debris was present in pipe sections from MH-56 to MH-55 and MH-55 to MH-54; and
- Black sludge/tar like material was observed throughout pipe sections from MH-54 to MH-78 and MH-78 to MH-77.

1.2.7 Conestoga-Rovers & Associates – August 2003

In August 2003, CRA submitted a report titled *Re-Routing and Abandonment Certification Report, Storm Sewer Segment from Manholes MH-54 and MH-76*, General Motors Powertrain Group, Tonawanda Engine Plant, Tonawanda, New York (CRA, August 2003) to GM ER & IES.

The report summarizes the sampling, investigations, replacement and abandonment of pipe sections from MH-54 to MH-78 and MH-78 to MH-77. In the pipe sections from MH-54 to MH-78 and MH-78 to MH-77, swarf material (material produced by machining operations) and a black sludge/tar like material were identified during a July 2003 storm sewer cleaning and videotaping. Analytical results of the swarf and black sludge/tar indicated both materials were impacted by PCBs ranging in concentrations from 1.47 ppm to 4,000 ppm. Subsequent cleanings were able to remove the swarf material by dry vacuuming, but the tar-like material could not be removed. Following the cleaning, GM experienced three consecutive water quality exceedances for PCBs at SPDES permitted Outfall 001. As a result of the exceedances, a bypass pumping system was set up at manhole locations (MH-54, MH-78, and MH-77) to eliminate flow through the pipe sections containing the tar-like materials. Based on an engineering evaluation, it was determined that the most effective solution was to re-route the sewer system upstream of the impacted areas by installing new sewer lines and abandoning in-place the impacted lines.

A direct-push investigation was performed in September 2002. The purpose of the investigation was to determine if PCB-impacted materials had migrated to the exterior of the existing sewer lines, and to pre-characterize soil in the areas where the new sewer lines would be installed for off-site disposal. Analytical results indicated that PCB-containing material located within the storm sewer pipes had not migrated to the exterior of the pipes.

An analysis was performed on the tar-like material and results did not exceed any of the leachable guidelines in 40 Code of Federal Regulation (CFR) Part 761 or 40 CFR Part 260. Based upon the results, the USEPA and NYSDEC concurred that abandonment of the PCB-containing material in-place using a non-erodible cement grout was an acceptable alternative to removal.

Between August 19, 2002, and September 7, 2002, the bypass at MH-54 was installed, connecting MH-54 to the GM Plant #4 mainline storm sewer. Between September 9, 2002, and September 23, 2002, the bypass at MH-78 was installed, connecting MH-78 to drop inlet DI-LH. Between September 11, 2002, and October 2, 2002, the bypass at MH-77 was installed, connecting MH-77 to MH-76.

On October 2, 2002, the storm sewer lines that ran from MH-54 to MH-76 were abandoned by backfilling with cement bentonite grout.

1.2.8 Groundwater & Environmental Services, Inc. – October 2012

In October 2012, Groundwater Environmental Services (GES) submitted a report titled *Limited Environmental Site Assessment and Site Activities Summary Report*, Tonawanda Forge, 2309 Kenmore Avenue, Tonawanda, New York 14207, NYSDEC Spill #0911809, NYSDEC Spill #1112690 (GES, October 2012) to the NYSDEC. The purpose of the limited Environmental Site Assessment (ESA) was to assess potential environmental conditions identified during numerous field visits, sampling events, and site investigations performed by GES at the Site. In addition to the ESA, GES was tasked by the NYSDEC with documenting various remedial activities being performed at the Site by Lewis' demolition contractor and other NYSDEC contractors.

The GES ESA was performed from August 2011 through September 2012. Based on the activities that were performed and documented during the ESA, the following observations and conclusions were made by GES:

Solid Samples

PCBs have impacted various solid materials at the Site which include concrete/brick found on the floor of the Forge building and wooden brick portions of the floor of the Forge building. Wipe and bulk samples from concrete/brick found on the floor of the Forge building indicated the presence of PCBs at concentrations ranging from non-detect (ND) to 280 milligrams per kilogram (mg/kg or ppm). Bulk samples from the wooden brick flooring material, indicated the presence of PCBs at concentrations ranging from 0.56 to 29 mg/kg. Because of these detections, the wooden brick flooring was removed from the Site. The bulk sample locations were later removed via milling of the concrete.

Subsurface Soils

PCBs were detected in subsurface soil beneath the former Forge building and in the Front Forty. PCBs in the subsurface soils beneath the former Forge building ranged from ND to 290 mg/kg at depths from 1 foot to 12 feet bgs, with the highest concentrations being detected in the fill material which was on average approximately 3 feet thick. PCB impacts were generally not detected in the native clay till underlying the fill material and if they were detected in the clay, they were two to three orders of magnitude lower than the concentrations found in the fill material. The highest concentrations of PCBs in the subsurface soils beneath the former Forge building occurred in the vicinity of the 300 ton presses (i.e., Tie Rod Socket area).

PCB-impacted soils were detected in subsurface soil beneath the Front Forty. PCBs in the subsurface soils at depths from 2 feet to 8 feet bgs ranged from ND to 69 mg/kg detected in the fill material, which was on average approximately 6 feet thick. PCBs were not detected in the native clay till underlying the fill material.

Groundwater

Groundwater samples collected from six new and one existing monitoring well indicated the presence of only common laboratory contaminants [acetone and bis(2-ethylhexyl)phthalate] in three of the seven monitoring wells. Semi-volatile organic compounds (SVOCs), metals, and PCBs were not detected in the groundwater samples collected.

Surface Water

Surface water samples were collected from the Front Forty ponded area and the flooded driveway/parking area. The surface water sample collected from the Front Forty ponded area indicated

concentrations below applicable NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for surface waters, with the exception of acetone. Surface water samples collected from the flooded driveway/parking area by both Titan and GES exceeded NYSDEC TOGS 1.1.1 values for PCBs and ranged from 3.9 to 350 µg/L.

Manhole Water

Water samples were collected from two manholes (MH-1 and MH-2) adjacent to the PCB oil spill area. Analytical data showed concentrations of PCBs that ranged from 7.99 to 1,254 µg/L.

PCB Oil Spill Cleanup

A total of 37 wipe and seven bulk samples were collected prior to remedial activities in the PCB spill area and surrounding areas. Wipe sample results from the concrete and brick surfaces indicated the presence of total PCBs ranging from 16.6 to 18,000 micrograms per 100 square centimeters (µg/100 cm^2). Bulk samples from the concrete and brick surfaces indicated the presence of total PCBs ranging from 2.7 to 280 mg/kg.

Following remedial activities in the PCB spill area, four milled concrete and brick bulk samples were collected from the milled concrete and brick. The results indicated the presence of total PCBs ranging from 0.48 to 28.1 mg/kg, which was below target threshold of 50 mg/kg as outlined in 40 CFR 761.125.

1.2.9 Remedial Investigation - URS Corporation – October 2012-2018

The Remedial Investigation report prepared by URS and dated January 2018 is summarized below.

1.2.9.1 Site Conditions

Subsurface information indicates that the following textural units underlie the Site, from the surface downward: Fill, Silty Clay Till, Lacustrine Clay, and bedrock. Bedrock was not encountered in the on-site borings, which were advanced to a maximum depth of 30 feet.

The primary hydrogeologic units at the Site are a discontinuous perched water table in the Fill and the water table in the Silty Clay Till. The depth to the fill unit groundwater ranged from about 1 to 6 feet bgs and groundwater in the Silty Clay Till was encountered from about 2 to 15 feet bgs.

Overall groundwater flow in the fill unit groundwater is toward the west with a horizontal hydraulic gradient that ranges from 0.0001 to 0.0336 foot per foot (ft/ft). Horizontal hydraulic conductivity obtained from field testing indicates values ranging from 3.73×10^{-5} cm/sec to 8.07×10^{-3} cm/sec.

A relative high in the groundwater surface occurs in the eastern portion of the Site and is likely due to groundwater recharge through the fill in AOC-1. Groundwater flow in the Silty Clay Till across the western portion of the Site is generally toward the west. The horizontal hydraulic gradients in the Silty Clay Till range from 0.0037 to 0.0226 ft/ft. Horizontal hydraulic conductivity values for the Silty Clay Till range from 7.11×10^{-8} cm/sec to 5.47×10^{-3} cm/sec with the higher hydraulic conductivity associated with sand lenses within the unit.

The surface of the Site is almost entirely covered by buildings, concrete, brick, wood blocks and/or pavement, with the exception of AOC-1 which is covered with grass. The sewers previously flowed into the GM-Tonawanda facility storm water system and ultimately discharged through GM's SPDES permitted Outfall 001. Several sewers, manholes and catch basins were re-routed, abandoned and plugged by GM

during remedial activities. After Lewis took ownership of the property and began demolition, GM installed bulkheads in their manholes to keep storm water which contained PCBs from entering their storm water system. As a result, surface water does not drain from the Site and ponds on the surface across the Site. The ponded surface water slowly disappears by either evaporation and\or downward percolation through cracks in the surface material and into the Fill water-bearing zone. Also, runoff water has been observed flowing from the ponded area on the east side of AOC-1 across the sidewalk onto Kenmore Avenue.

1.2.9.2 Summary of RI Analytical Results

No background samples were collected. Therefore, the analytical results were only compared to promulgated and non-promulgated standards, criteria, and guidance values. Locations of samples collected during the RI are shown on Plate 2.

The groundwater analytical results are compared to Class GA groundwater standards, criteria, and guidance values (SCGs) presented in TOGS 1.1.1 and the surface water analytical results are compared to Class A surface water SCGs also presented in TOGS 1.1.1.

Soil and sediment analytical results were compared to three 6 New York Codes, Rules and Regulations (NYCRR) Part 375 Soil Cleanup Objective (SCO) categories:

- Unrestricted Use
- Protection of Groundwater
- Industrial Use

The Unrestricted Use category is required by DER-10 Section 4.4 (b) 3 ii. The level and extent of contamination found at the Site makes it unsuitable for unrestricted use without remediation .and will not be included in this summary.

The Protection of Groundwater category is used to address the potential for residual soil contamination to leach and act as a long-term source of groundwater contamination. For organics, the Protection of Groundwater criteria are based on the ability of organic matter in soil to adsorb organic chemicals and prevent them from leaching out of the soil. The criteria are calculated using a default fraction of organic carbon value and published soil-water partition coefficients. For inorganics, published soil-water distribution coefficients are used. As such, the Protection of Groundwater criteria were developed using generic site conditions and may not accurately reflect actual Site conditions. As a result, it is prudent to evaluate exceedances of Protection of Groundwater criteria in comparison to actual contaminant concentrations in groundwater. The following presents a broad summary of contaminant conditions at the Site. Because contaminant concentrations exceed Unrestricted Use criteria across most of the Site, the Unrestricted Use category is not included in this summary.

Wipe samples were compared to 100 ug/100 cm^2 for non-porous surfaces given in 40 CFR Part 761.125 for low-occupancy.

1.2.9.2.1 Asbestos Containing Materials Impacts

Asbestos containing material (ACM) is present on the ground surface in every AOC except for AOC-1. These materials are primarily roofing material left over from the demolition, and sealant used between concrete sections.

1.2.9.2.2 Surface Cover Impacts

The site is primarily covered by concrete and asphalt. Areas formerly inside the buildings exposed after demolition also include surface cover with brick, and tile. All except one wipe samples collected exceeded the 40 CFR 761.79 decontamination standard of ≤10 µg/100 cm^2 for PCBs. However, only one brick chip sample exceeded the threshold of 50 mg/kg that requires disposal as a hazardous waste.

1.2.9.2.3 Soil Impacts

No volatile organic compounds (VOCs) were detected in the soils at concentrations exceeding Industrial Use criteria. Acetone exceeded Unrestricted Use and Protection of Groundwater criteria in AOC-01, AOC-02, AOC-06, AOC-09, AOC-10, AOC-13, AOC-14, AOC-16 and North of AOC-14; and methylene chloride exceeded Unrestricted Use and Protection of Groundwater criteria in AOC-13 and the parking lot.

SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs), were detected in AST/manhole/catch basin sediments, surface soils, and subsurface soils at concentrations exceeding Unrestricted Use, Protection of Groundwater and Industrial Use criteria. In general, SVOC concentrations were relatively low, within one order of magnitude of the SCOs. The Site is located in an industrial area and it is possible that PAHs detected at the Site may reflect, in part, background conditions.

PCBs were detected in AST/manhole/catch basin sediments, surface soils, and subsurface soils at concentrations exceeding Unrestricted Use, Protection of Groundwater, and Industrial Use criteria. The highest PCB levels in soils were found in AOC-8, AOC-12, AOC-13, and AOC-15. PCBs were also detected in stained concrete.

The presence of arsenic in soils at concentrations exceeding its Industrial Use criterion was found at several locations in AOC-1 and AOC-5 and at one location in AOC-8 and AOC-12. Mercury was detected in one location in AOC-1 at a concentration exceeding the Industrial Use criterion.

1.2.9.2.4 Groundwater Impacts

Two groundwater sampling events were conducted during the RI (January 2014 and November 2016). With the exception of acetone and methylene chloride in the first event only, no VOCs were detected in groundwater at concentrations exceeding NYSDEC TOGS (1.1.1) Class GA groundwater standards. Acetone and methylene chloride are common laboratory contaminants and the sporadic detections of these two VOCs suggests that they are not Site contaminants.

With few exceptions, SVOCs were not detected in groundwater at concentrations exceeding criteria. Exceptions included six detections of phenolic isomers (i.e., phenol, cresols), one detection of bis(2-ethylhexyl)phthalate (in the first event only), and one detection of PAHs.

PCBs were detected in groundwater at concentrations exceeding criteria at numerous locations across the Site. In general, PCB impacts are relatively low. However, PCB impacts in AOC-13 are considerably higher than at other locations across the Site. As noted above, some of the highest PCB in soil impacts were detected in AOC-13, and adjacent AOC-12 and AOC-15.

Arsenic, chromium, lead, selenium and/or thallium were detected above groundwater criteria in only AOC-1, AOC-5, AOC-12, AOC-13, and AOC-16. Iron, magnesium, manganese, and sodium were also detected above their relevant criteria at numerous locations across the Site.

1.2.9.2.5 Light Non-Aqueous Phase Liquid Impacts

Eight light non aqueous phase liquid (LNAPL) samples were collected: two from ASTs, one from a standpipe, four from manholes and one from a monitoring well. With the exception of the monitoring well, LNAPL thicknesses in seven of the eight samples ranged from 1/8-inch to 1-inch. The LNAPL present in the monitoring well (AOC-14-MW-21I) was measured at 96 inches. Three LNAPL samples were identified as motor oil, one sample (AOC-14-MW-21I) as diesel fuel, and the remaining four samples were unknown petroleum hydrocarbons. Four of the samples (AOC-14-MW-21I, MH-59, MH-108 and MH-120) contained PCBs at concentrations greater than 50 mg/kg and are considered PCB liquid waste per 40 CFR Part 761. The location of all manholes can be found on Plate 1. Periodic removal of the LNAPL in AOC-14-MW-21I has been completed. The source of the LNAPL in AOC-14-MW-21I was the subject of further investigation through an IRM and is discussed in Section 1.2.10.

1.2.9.2.6 Sewer System Impacts

A complex network of utilities underlies the Site. Available information indicates the presence of electrical lines, storm sewers, sanitary sewers, non-contact cooling water, perforated pipe, industrial waste lines, fire protection, and mill water lines. Surface expressions of these systems consist of manholes, catch basins, and current and former roof drains. The available information indicates that storm and sanitary sewers ran from the eastern, upgradient portion of the Site to the former industrial waste treatment plant on the western side of the Site. Discharge from the treatment plant would have been to the west via a storm sewer. As previously stated, sewers leading off Site have been plugged.

Accessible manholes and catch basins were opened and inspected. Sediment samples were collected from those manholes that contained a recoverable volume of sediment. Also, LNAPL samples were collected from four manholes; sediment sampling at these four locations was not attempted.

The catch basins and the majority of manholes sampled were associated with the storm sewer system; manholes MH-119 and MH-120 appear to be associated with the IW line, and manholes MH-117, MH-126, and MH-137 were associated with the sanitary sewer.

LNAPL

LNAPL was present in manholes MH-59, MH-108, MH-119, and MH-120. As mentioned above, manholes MH-119 and MH-120 appear to be associated with the IW line. Manhole MH-108 might be associated with the IW line. The sample from MH-108 was identified as motor oil, the sample from MH-119 as an unknown petroleum hydrocarbon, and the sample from MH-120 as motor oil.

Manhole MH-59, located on the southern side of the Site, is associated with the storm sewer system. The analytical results were inconclusive, identifying the sample as an unknown hydrocarbon.

LNAPL, identified as No. 2 fuel oil, was found in monitoring well AOC-14-MW-21I. It was initially suspected that during drilling, the drill rig might have punctured a fuel pipeline, resulting in a release of the product into the formation. A subsequent test trench excavation encircling the well on November 12-15, 2018 did not reveal piping or an obvious LNAPL source.

Sewer Sediments

Sewer sediment samples were collected from 34 catch basins and 11 manholes. There are no cleanup standards specific to sewer sediments. Because the sediments are located at depth and could be encountered by a construction worker during future development, the analytical results were compared to

Part 375 Industrial Use SCGs for soil. The results were also compared to Unrestricted Use and Protection of Groundwater SCGs, however, because Industrial Use is the most applicable category for the sewers, the following discussion focuses on the evaluation of the sediment results with respect to the Industrial Use SCGs.

Sediment samples from 10 manholes and 28 catch basins contained at least one PAH, PCB, or metal at a concentration exceeding the Industrial Use SCGs. Benzo(a)pyrene, which has a very low Industrial Use SCO, was the predominant PAH exceeding criteria. In general, PAH concentrations were relatively low, within one order of magnitude of the Industrial Use criteria. However, the highest PAH concentrations detected in AOC-12 manhole MH-51 had PAH levels more than two orders on magnitude above the Industrial Use criteria.

PCBs were detected at concentrations above the Industrial Use criteria at 15 locations. The predominance of PCBs in manholes and catch basins on the west side of the Site suggests possible impacts along the sewer lines in that area (i.e., not just in the manholes and catch basins). PCB concentrations in the western manholes/catch basins ranged from 32 to 880 mg/kg.

In the southern portion of the Site, PCBs were detected above the Industrial Use SCG in manholes MH-128, and MH-132. These manholes appear to be associated with the industrial waste sewer line.

Also in the southern portion of the Site, PCBs were detected above the Industrial Use SCG in catch basin CB-33, which appears to be an isolated location of PCB impacts in the southern side catch basins.

Sewer system drawings are incomplete; the exact pipeline sizes and routing are unknown. As a result, the volume of impacted sediments in the sewers cannot be determined.

1.2.9.2.7 Surface Water Impacts

One surface water sample was collected from the drainage swale adjacent to Kenmore Avenue (AOC-1-LF-SW-01) during the RI Phase I sampling event. A second surface water sample was collected from the parking lot during the RI Phase II sampling event (Parking Lot Water).

No VOCs or PCBs were detected above Class A surface water SCGs in either sample. PAHs were detected above Class A surface water SCGs in the AOC-1-LF-SW-01 sample. No SVOCs were detected in the parking lot standing water sample.

Metals exceeding Class A SCGs in the AOC-1-LF-SW-01 surface water sample were aluminum, iron, lead, and zinc. No metals exceeded Class A criteria in the parking lot standing water sample.

1.2.9.2.8 Contaminant Fate and Transport

The Site and vicinity is mostly covered with asphalt and concrete. Also, the majority of contaminants detected in soil and groundwater are not readily volatile. As a result, the migration of contaminants in the gas phase is likely minimal, if any.

Contaminants of concern in groundwater are primarily limited to PCBs, arsenic and some phenolic isomers. Overall groundwater flow is to the west for both the Fill and Silty Clay Till water-bearing zones.

In the surface water sample collected from the Site parking lot, no compounds were detected at concentrations exceeding surface water criteria. The surface water sample collected from the east side of

AOC-1, was collected from a drainage swale. The sample contained several PAHs and metals at concentrations above the surface water criteria. However, as no background or upgradient samples were collected, it is unknown whether the results reflect Site impacts or background conditions. It is likely that the PAHs and metals will sorb to sediments and are unlikely to degrade or otherwise be transformed. Consequently, contaminant transport may occur through physical transport of the surface water and sediment particles.

Many of the contaminants detected above SCGs in the sewer sediment samples were not detected above SCGs in either the soil or groundwater. This absence of groundwater impacts, along with the observed surface water ponding at the Site, suggests that the contaminants in the sewer systems are contained and not migrating.

1.2.10 Interim Remedial Measures – January 2016 to May 2019

The NYSDEC initiated the first IRM at the Site in 2015. The remedial measure involved the removal of construction and demolition debris from the Site. The main goal of this IRM was to remove contaminated surficial debris that was hindering investigations required to properly complete the ongoing RI. Specifically, the IRM included the removal, transportation, and off-site disposal of three large surficial piles containing approximately 6,000 tons of construction and demolition debris contaminated with asbestos and/or PCBs. The IRM was completed in January 2016 and the Construction Completion Report (CCR) was approved in August 2016.

In November 2016, 15.5 feet of oil was observed in groundwater monitoring well AOC-14-MW-21I. The LNAPL was found to contain a PCB concentration of 270 parts per million (ppm). An additional investigation in November 2018 was conducted to locate and remove the source of the PCB LNAPL that appeared in monitoring well AOC-14-MW- 21I. A ground penetrating radar (GPR) survey identified a pipeline adjacent to AOC-14-MW-21I that extends approximately 260 feet to the southeast, ending at a vault in AOC-02, approximately 100 feet west of the Administration Building. However, the source was not found. The NYSDEC recovered approximately 155 gallons of LNAPL in AOC-14-MW-21I from November 2016 to May 2019.

1.3 Overall Nature and Extent of Contamination Summary

This section summarizes NYSDEC's ROD and describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described above, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the Site in the media and compares the data with the applicable SCGs for the Site. The contaminants are arranged into VOCs, SVOCs, PCBs, and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified above are also presented.

1.3.1 Waste/Source Areas

As described in the RI report, waste/source materials were identified at the Site and are impacting groundwater, soil, sewer sediments, and surface water.

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and Source areas were identified at the Site include:

1.3.1.1 Waste/Source Areas – Asbestos

A total of 123 bulk samples for asbestos analysis were collected across the Site. The majority of the Site has ACM present at the surface. Along the southern edge of the property and the western edge of the asbestos survey area there is an approximate 100-foot wide area zone where no ACM was identified.

1.3.1.2 Waste/Source Areas – LNAPL

Eight LNAPL samples were collected from ASTs, manholes, one standpipe, and one monitoring well. A summary of the PCB detected results and properties of all LNAPL samples is shown on Figure 3A.

VOCs were detected at low concentrations (less than 1.1 part per million (ppm)) in all but one LNAPL sample. Petroleum-related compounds (i.e., benzene, toluene, ethylbenzene, isopropylbenzene, and/or xylene) were found in two samples. Other VOCs detected in one or more of the LNAPL samples include 1,1-dichloroethane, 1,1-dichloroethene, 1,2,4-trichlorobenzene, methyl acetate, and methylene chloride. SVOCs bis(2-ethylhexyl)phthalate and caprolactam, along with several polycyclic aromatic hydrocarbons (PAHs), were detected in the standpipe, manhole, and one monitoring well sample.

PCBs were detected in the LNAPL samples collected from each of the four manholes sampled, and in the monitoring well AOC-14-MW-21I with a total PCB concentration of 270 ppm. Soil or waste containing PCB concentrations greater than 50 ppm is a hazardous waste in New York State.

Results for the identification of specific petroleum products in the LNAPL samples were inconclusive.

1.3.1.3 Waste/Source Areas – Surface Materials

Twenty-four concrete chip samples, fifteen brick chip samples, two asphalt samples, two bulk solids samples, and six wipe samples were collected for PCB analysis and compared to the Toxic Substances Control Act (TSCA) definition of PCB remediation waste (50 ppm).

Concrete chip samples: none of the results exceeded the 50 ppm for total PCBs.

Brick chip samples: PCBs were detected in 12 of the 15 samples. Brick chip sample results exceeded 50 ppm total PCBs at one location.

Bulk Solids Samples: PCBs were detected in both samples. Bulk solid sample results exceeded 50 ppm total PCBs at one location.

Asphalt Samples: No PCBs were detected in either of the two samples.

Wipe Samples: PCBs were detected in five of the six samples from various non-porous surfaces. Five of the samples had total concentrations greater than the SCG criterion of 10 micrograms per 100 square

centimeters (µg/100 $cm^{2)}$, or microgram per wipe (µg/wipe). Two of those wipe samples contained PCB concentrations greater than 100 µg/100 cm^2.

A summary of the detected results and properties of all surface material samples where results exceed PCB SCGs are shown on Figure 3B.

1.3.1.4 Waste/Source Areas – Sewer Sediments

Forty-eight sediment samples were collected from 11 manholes, 34 catch basins, two ASTs, and one 8-inch diameter pipe connecting the two ASTs. Although there are no cleanup standards specific to sewer sediments, sediments are located at depth and could be encountered by a construction worker during future development. Therefore, analytical results, presented in Figure 3C, are compared to Part 375 Industrial Use SCOs. The manholes and catch basins are not connected to public owned treatment works sewers or outfalls.

Of the 48 samples, none exceeded the Industrial Use SCO for VOCs. However, 36 samples exceeded Industrial Use criteria for SVOCs, including PAHs.

PCBs exceeded Industrial Use criteria in ten catch basin and five manhole locations. Six catch basins and three manholes had a total PCB concentration between 50 and 500 ppm and require management as hazardous wastes. PCB concentrations in the western manholes/catch basins ranged from 32 to 380 ppm. The maximum total PCB concentration was 880 ppm.

Metals exceeding Industrial Use criteria include arsenic at eight locations and copper at one location. Certain waste/source areas identified at the Site were addressed by the IRM(s) described in Section 1.2. The remaining waste/source area(s) identified during the RI will be addressed in the remedy selection process.

1.3.2 Soil

Surface and subsurface soil samples were collected at the Site during the RI. A total of 48 surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. In addition, 272 subsurface soil samples were collected from a depth of 2 - 30 feet to assess soil contamination impacts to groundwater. As shown in Table 1, the results indicate that soils at the Site exceed the unrestricted SCOs for volatile and semi-volatile organics, PCBs and metals. Several metals, PAHs, and PCBs were present above industrial SCOs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, arsenic, mercury, and PCBs.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene, arsenic, mercury, and PCBs.

1.3.3 Surface Water

One surface water sample was collected from the drainage swale adjacent to Kenmore Avenue (AOC-1-LFSW-01) during the RI Phase I sampling event. Due to inadequate drainage, ponding occurs across the Site. A second surface water sample was collected from such an area in the parking lot during the RI

Phase II sampling event (Parking Lot Water). A summary of detected analytical results for the surface water samples compared to Class A surface water SCGs is presented in Table 2.

Neither sample contained VOCs or PCBs with concentrations above Class A surface water SCGs. Furthermore, the parking lot standing water sample did not exceed Class A surface water SCGs for SVOCs and metals. However, SVOCs (i.e. PAHs) and metals (aluminum, iron, lead, and zinc) were detected above Class A surface water SCGs in the AOC-1-LFSW-01 sample.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of surface water. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of surface water to be addressed by the remedy selection process are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, pyrene, aluminum, iron, lead, and zinc.

1.4 Summary of the Selected Remedy: OU1 – On-Site Soil, Sewer Sediment and Surface Water Contamination

The NYSDEC issued a ROD for the Tonawanda Forge Site for OU1 in March 2020. While the storm water sewer system remains in place, the outlets have been blocked at the property boundaries by the adjacent property owner, GM, in order to prevent contaminated surface water from entering their property. This has resulted in storm water ponding across the Site. Neither VOCs nor PCBs were detected above Class A Ambient Water Quality Standards and Guidance Values. However, PAHs and metals (aluminum, iron, lead, and zinc) were present above the Class A standards (generally between 0.0012 and 0.002 ppb, 100 ppb, 300 ppb, 7 ppb, and 134 ppb, respectively).

No VOCs exceed SCOs for Industrial Use. SVOCs, PCBs, and metals were found in surface and subsurface soil samples across the Site. As groundwater is present at shallow depths (1-2 feet bgs), the majority of the subsurface soils are present in the saturated zone. Of the SVOCs analyzed, six constituents (primarily PAHs) had maximum concentrations that exceeded SCOs: benzo(a)anthracene (190 parts per million [ppm]; SCO 11 ppm), benzo(a)pyrene (170 ppm; SCO 1.1 ppm), benzo(b)fluoranthene (240 ppm; SCO 11 ppm), chrysene (200 ppm; SCO 110 ppm), dibenz(a,h)anthracene (10 ppm; SCO 1.1 ppm), and indeno(1,2,3-c,d)pyrene (32 ppm; SCO 11 ppm). Concentrations of PCB and PAH results obtained from all investigations to date at depth intervals between 0-2 feet, 2-4 feet, 4-6 feet, 6-8 feet, 8-10 feet 10-12 feet and 12-28 feet bgs are provided in Figures 4 through 17. Metals (arsenic and mercury) exceeded industrial use SCOs of 16 ppm and 5.7 ppm with maximum concentrations of 93.2 ppm and 6.6 ppm, respectively.

Although no specific criteria exist for sewer sediment contaminant concentrations, they have been compared to the Class A Sediment Guidance Values (SGV). Aside from two exceedances of 1,1-dichloroethene (maximum concentration of 1.2 ppm with an SGV of 0.52 ppm) and toluene (maximum concentration of 6.9 ppm with an SGV of 0.93 ppm), there are no exceedances of VOCs or SVOCs. Metals and PCBs are present in the vast majority of the sediment samples. Exceedances of total PCBs were found in 43 of 48 samples and range from 0.59 to 880 ppm (SGV of 0.1 ppm).

The elements of the selected remedy for OU1 as presented in the ROD are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design,

implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling, and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including surface and subsurface soils:

- grossly contaminated soil, as defined in NYSDEC New York Code of Rules and Regulation (6 NYCRR) Part 375-1.2(u);
- soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- non-aqueous phase liquids;
- soil with visual waste material or non-aqueous phase liquid; and
- subsurface soil containing total SVOCs exceeding 500 ppm.

Excavation and off-site disposal of all on-site soils which exceed Industrial Use SCOs, as defined by 6 NYCRR Part 375-6.8, except in the landfill area at the east end of the Site (AOC-1). This includes soils containing PCBs above 25 parts per million, as defined in 40 CFR Part 761.61(a)(4)(B)(1) and disposed of according to 40 CFR Part 761.61(a)(5)(i)(B).

Approximately 2,400 cubic yards of contaminated soil will be removed from the Site. Excavation and removal of any USTs, fuel dispensers, underground piping, or other structures associated with a source of contamination will be completed. It is anticipated that a significant amount of piping will be encountered during the surface and subsurface excavation.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the Site.

4. Cover System

A site cover will be required to allow for industrial use of the Site in areas where the upper one foot of exposed surface soil will exceed the applicable SCOs. Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper 6 inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the Site, will meet the SCOs for cover material for the use of the Site as set forth in 6 NYCRR Part 375-6.7(d). Substitution

of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs. This excludes approximately 200 cubic feet of PCB contaminated concrete that will be demolished, removed, and properly disposed as PCB contaminated waste.

5. Contaminated Sewer Cleaning and Grouting

Approximately 19,000 linear feet of contaminated on-site sewer lines will be cleaned using jetting or a similar, practical sewer cleaning technology. Liquid and solid spoils from the cleaning will be collected, sampled, and either treated on-site or transported and disposed of off-site as appropriate. Sewer cleaning will immediately be followed by the sealing of sewers with flowable fill, pumped, or tremied, as appropriate.

6. Surface Water Control

A series of new, clean catch basins and storm water collection systems will be constructed to connect to the existing Town of Tonawanda municipal separate storm sewer system (MS4). The new catch basins and collection system will drain ponded water from the Parking Lot area, the ponded area between AOC-1 and Kenmore Avenue, along with other areas of ponding on-site (Figure 18). Detention of the storm water collected, if necessary, to meet peak flow criteria established by the Town of Tonawanda, will be achieved within the collection system. Samples will be collected prior to initial discharge and as required by the Town of Tonawanda and must meet discharge limits.

7. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or Site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for low occupancy, industrial use as defined by Part 375-1.8(g) and 40 CFR 761.3, although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or Erie County Department of Health; and
- require compliance with the Department approved Site Management Plan.

8. Site Management Plan

A Site Management Plan is required, which includes the following:

1. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the Site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.

Engineering Controls: The soil cover discussed in Paragraph 4 and the Surface Water Control discussed in Paragraph 6 above.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement, including any land use, and groundwater;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the Site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision requiring a risk-based approval from the United States Environmental Protection Agency prior to any change of use to high occupancy, industrial use as defined by 40 CFR 761.3 and 40 CFR 761.61 (a)(4)(i)(B)(3)(v);
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 4 above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable SCOs;
- provisions for the management and inspection of the identified engineering controls; maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2. Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for any buildings on the Site.

2.0 PRE-DESIGN INVESTIGATION

AECOM and our subcontractor team will complete a Pre-Design Investigation (PDI) to refine remedial extents and requirements and to generate data to support the development of a PCB remedial plan for submittal to USEPA following completion of the Pre-Design Investigation. All activities will be supervised by AECOM personnel. The following work elements will be performed as part of the PDI:

- Review the Asbestos Survey and environmental sampling and assess whether ACM has migrated into the storm sewer network;
- Evaluation of storm sewer contents and sampling of sewer sediments and liquids for waste characterization;
- Soil contamination delineation and environmental sampling of surface soils;
- Review of environmental sampling of concrete/bricks/non-porous surfaces impacted by former spills;
- Soil borings and soil sampling to refine the delineation of TSCA-regulated soil;
- Test pits to assess and characterize miscellaneous sub-grade materials in areas with LNAPLs; and
- Survey sampling and test pit locations.

Investigation locations are shown in Figures 19 and 20. Table 3 provides the rationale for soil sampling program in the AOCs. Table 4 provides the rationale for sewer water, sewer sediment, surface water and LNAPL sampling program. The work will be performed in accordance with this work plan and Generic FAP, Generic QAPP and site-specific HASP are included in Appendices A, B and C, respectively.

2.1 Asbestos Survey

AECOM personnel will conduct additional asbestos sampling survey in surface water and sediments contained within the storm sewer network using protocols outlined in the United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) (40 CFR Part 763) and 12 NYCRR Part 56-5. This survey will further document suspect asbestos containing materials (SACMs) and note their appearance, condition, and approximate quantities.

Representative samples of each SACM identified will be sent to an NYSDOH Environmental Laboratory Approval Program (ELAP) certified asbestos lab, under chain-of-custody for analysis. Soil/sediment will be analyzed via polarized light microcopy (PLM) using USEPA Method 600. Surface water will be analyzed via transmission electron microscopy (TEM) using USEPA Method 100.2 (Long Fibers >10 microns only) . The survey will include no more than 40 sediment and water samples will be collected and analyzed for asbestos. For safety purposes and to increase the efficiency of the survey, AECOM will provide a team of two (2) technicians for the fieldwork.

Using the data generated during the survey activities, AECOM will prepare a survey report to supplement prior asbestos reports and will include the following:

1 A summary of the location, quantity and condition of the SACMs and ACMs encountered during the survey;
2 A photo log of the survey, showing materials and sample locations.

Based upon the results of the asbestos survey, combined with the results of previous asbestos sampling, AECOM will provide abatement specifications for the Site. These specifications will be generated in accordance NYSDEC, New York State Department of Labor (NYSDOL) and Occupational Safety and Health Administration (OSHA) requirements and include, but not be limited to, the following:

- A copy of the comprehensive asbestos survey report, showing quantities and locations of ACMs to be removed; and,
- Instructions for the abatement contractor to adhere to 12 NYCRR Part 56, where applicable with any and all variances authorized by the NYSDOL.

2.2 Storm Sewer Water and Sediment Sampling

There is approximately 19,000 linear feet of storm sewer that needs to be cleaned and closed in place with flowable fill (i.e., low strength concrete) as part of the ROD. Materials inside the storm sewer network must be characterized, removed and transported appropriately offsite for disposal. The storm sewer water may need treatment before discharge to the Tonawanda publicly owned treatment works (POTW).

As part of this Task, AECOM will collect paired water/sediment samples at approximately 15 additional locations within the on-site storm sewer network. The selected locations are accessible without the need for heavy equipment to remove obstructions. The sampling and characterization for this effort is summarized below and listed on Table 5:

- Collect 16 sludge/waste samples and analyze all samples for full Target Compound List (TCL)/Target Analyte List (TAL) parameters [Note: reference to full TCL does not include pesticides and herbicide analyses as these parameters are typically not associated with this Site. Eight of the sample locations will also be analyzed for full Toxicity Characteristics Leaching Procedure (TCLP) parameters and Resource Conservation and Recovery Act (RCRA) characteristics of ignitibility, corrosivity (pH), and reactivity.
- Collect 16 storm sewer water samples and analyze all samples for TCL/TAL parameters and RCRA characteristics. Eight of the sample locations will also be analyzed for POTW (or SPDES) discharge parameters.
- Because sediment and storm water contained within the sewer network is considered to be dynamic, sampling locations will be determined in the field after drop inlets are inspected and invert depths are measured. Sampling locations will be selected based upon proximity to former spills and observations made during the field inspections and measurements. It is anticipated that 21 locations will be sampled for sewer/surface water and 16 locations will be sampled for sediments.
- LNAPL samples will be collected from two manhole locations. The LNAPL samples will be analyzed for TCL/TAL parameters, RCRA characteristics, petroleum product ID, and physical characteristics.

2.3 Surface/Subsurface Soil Contamination Delineation

- Collect 25 samples of concrete chip and brick chips of staining on surfaces around the Site and analyze for PCBs. An additional 10 wipe samples will be collected from nonporous surfaces and analyzed for PCBs. Sampling locations will be selected based upon proximity to former spills and observations made during the field inspections and measurements.
- Advance direct-push soil probes to depths down to 20 feet bgs. Borings will be distributed at 20 to 50-foot intervals where further delineation is needed to segregate TSCA waste.
- Collect approximately 300 primary soil samples from the soil probes. Each soil sample will be analyzed for TCL PCBs. Twenty representative samples collected will be analyzed for the full TCL/TAL parameters where PAH contamination is likely co-located. In addition, two composite soil samples will be analyzed for waste characterization parameters (i.e., Full TCLP and RCRA

characteristics – Table 5). Proposed locations for soil borings are provided on Figure 19. These boring locations represent approximately 90% of the samples to be collected. Additional locations (approximately 25 samples) will be developed based on the results of the initial boring program to complete delineation of PCB impacts necessary to obtain approval of the PCB remedial plan.

- Following drilling, abandon each soil boring by backfilling with the soil removed from the borehole and/or with cement/bentonite grout. Soil spoils not returned to boreholes will be drummed for proper off-site disposal.

2.4 Test Pits

- Direct Test pits will be excavated in select locations of the Site to further assess the potential for LNAPL. Approximately, nine test pits will be excavated to approximately 6-8 feet bgs, or until the saturated conditions fill the pit, whichever is less. The length of each test pit is estimated to be no more than 15 feet.

  Immediately following the inspection of each test pit and collection of any samples, the test pit will be backfilled with the excavated soil. The soil will be replaced in the reverse order from how it was removed (i.e. last soil out will be the first soil back in) such that soil stratigraphy will remain the same as it was prior to excavation. The soil will be compacted in approximately 2-foot lifts by using the backhoe bucket. Proposed locations of test pits are provided on Figure 19.

- Up to two soil samples will be collected from each of the test pit with one of the soil samples collected from the area exhibiting the highest level of contamination based on visual inspection and/or photoionization detector (PID) readings. If contamination is detected in the test pit, the second soil sample will be collected from the clean interval below this area of contamination to define its vertical limit (e.g., until native materials or groundwater are encountered). If no contamination is observed in the test pit, one soil sample would be collected from the bottom area of the excavation. The soils samples will be collected from the backhoe bucket by an AECOM geologist. Site personnel will not enter any excavation. All samples will be analyzed for TCL PCBs, nine samples will be analyzed for full TCL/TAL parameters, and two samples for full TCLP and RCRA characteristics). If LNAPL is encountered during the test pit excavation, samples will be collected and analyzed for the same parameters as the manhole sample LNAPLs.

2.5 Laboratory Validation

Table 5 summarizes the sample analytical program and associated quality control samples. Category B data deliverables will be provided by the laboratory for all analytical data. Analytica data will be validated and a Data Usability Summary Report (DUSR) will be included in AECOM report deliverable (Section 3.0). Sample data will be submitted to the NYSDEC in the Department's EQuIS electronic data deliverable (EDD) format after the data is validated.

2.6 Investigation-Derived Waste Management

All investigation-derived waste (IDW), including purge and decontamination water and soil spoils from borings will be drummed for disposal. Drums will be categorized and removed from the Site after analytical results from the environmental sampling are received from the laboratory.

2.7 Engineering Survey

A survey will be completed including the location of direct-push sample probe locations, test pit locations, manhole inverts, and other environmental sample locations, edges of the pavement, erosional features, key grade changes, and other notable features. The survey will tie into the existing site survey and basemap. The survey cost does not include a full property survey for the Environmental Easement.

3.0 PRE-DESIGN INVESTIGATION REPORT

A Pre-Design Investigation Report will be prepared following completion of field activities. The data presented in the RI, FS, Hazardous Building Materials Survey, and information obtained as part of Section 2.0 will be summarized and included in the Pre-Design Investigation Report. The report will include the following:

- A description of field activities conducted on the Site;
- A summary of previous investigations;
- Figures depicting relevant Site features and soil probe, test pit, and ACM locations;
- Figures presenting analytical results in comparison with applicable SCGs;
- Data summary tables of detected compounds with NYS SCGs listed, and non-compliance values highlighted;
- A discussion of analytical results;
- An ACM survey report;
- Field notes;
- Daily activity/boring/test pit logs;
- Photographs taken during field activities;
- Manifests and bills of lading signed by the disposal facility documenting the proper disposal of IDW;
- Survey field notes, site sketches, and drawings;
- A DUSR (including Form 1s) containing only data from the fieldwork;
- Summary of waste materials and bid quantities; and,
- Recommendations for further actions, as warranted.

The Pre-Design Investigation Report will be submitted as a draft report after analytical data is received from the laboratory. A final version of the report will be submitted within four weeks after the NYSDEC's comments on the draft report are received by AECOM.

Category B deliverables are required for all soil and groundwater samples. IDW will be generated throughout the various tasks and will be handled in accordance with the procedures in the Generic Field Sampling Plan for this contract.

The information obtained from the Pre-Design Investigation and previous investigations will be used to complete the remedial design for the Site. The data in the Pre-Design Investigation Report will be incorporated into a PCB Remedial Plan, which serves as a notification pursuant to 40 CFR Part 761.61(a)(3), to be submitted to USEPA to obtain approval for the portions of the remedy related to excavation, disposal, and capping of PCB-impacted soils. The PCB Remedial Plan will identify the proposed cleanup objectives and detail the remedial design and procedures for post-excavation verification sampling, decontamination, materials management, field oversight and monitoring, and documentation associated with the planned remedial activities.

Field Sampling and Implementation Schedule

Activity	Dates
Surface Soil Sampling	November 2 – 12, 2020
Subsurface Soil Sampling	November 2 – 10, 2020
Concrete Chip Sampling	November 10 - 12, 2020
Sewer Sediment Sampling	December 1 - 4, 2020
Sewer Water Sampling	December 1 - 4, 2020
Test Pit Excavation/Sampling	December 7 - 10, 2020

TABLES

TABLE 1
TONAWANDA FORGE, SITE No. 915274
PRE-DESIGN INVESTIGATION WORK PLAN
NYSDEC WA D009803-24
HISTORICAL SOIL RESULTS SUMMARY

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG (ppm)[b]	Frequency Exceeding Unrestricted SCG	Industrial SCG (ppm)[c]	Frequency Exceeding Industrial SCG	Protection of Groundwater (PGW) SCG (ppm)[d]	Frequency Exceeding PGW SCG
VOCs							
Acetone	0.00480-0.370	0.05	21/317	1,000	0/317	0.05	21/317
Benzene	0.000290-0.005	0.06	0/319	89	0/319	0.06	0/319
Chlorobenzene	0.000890-0.00089	1.1	0/317	1,000	0/317	1.1	0/317
Chloroform	0.000350-0.00068	0.37	0/319	700	0/319	0.37	0/319
Ethylbenzene	0.000410-0.0022	1	0/315	780	0/315	1	0/315
Methyl Ethyl Ketone (2-Butanone)	0.00910-0.054	0.12	0/319	1,000	0/319	0.12	0/319
Methylene Chloride	0.00250-0.058	0.05	2/317	1,000	0/317	0.05	2/317
Tetrachloroethylene (PCE)	0.00660-0.026	1.3	0/317	300	0/317	1.3	0/317
Trichloroethene	0.07-0.07	0.47	0/319	400	0/319	0.47	0/319
Toluene	0.000450-0.0046	0.7	0/315	1,000	0/315	0.7	0/315
Xylenes, Total	0.000960-0.0085	0.26	0/315	1,000	0/315	1.6	0/315
SVOCs							
2-Methylphenol (O-Cresol)	0.00720-0.03	0.33	0/320	1,000	0/320	0.33	0/318
4-Methylphenol (P-Cresol)	0.0150-4.70	0.33	3/320	1,000	0/320	0.33	3/320
Acenaphthene	0.00560-29.0	20	2/318	1,000	0/318	98	0/318
Acenaphthylene	0.00870-1.80	100	0/318	1,000	0/318	107	0/318
Anthracene	0.00600-61.0	100	0/318	1,000	0/318	1,000	0/318
Benzo(A) Anthracene	0.00740-190	1	42/318	11	8/318	1	42/318
Benzo(A) Pyrene	0.00880-170	1	43/318	1.1	38/318	22	4/318
Benzo(B) Fluoranthene	0.00630-240	1	57/318	11	11/318	1.7	42/318
Benzo(G,H,I) Perylene	0.00580-30.0	100	0/318	1,000	0/318	1,000	0/318
Benzo(K) Fluoranthene	0.00230-110	0.8	32/318	110	0/318	1.7	21/318
Chrysene	0.00680-200	1	48/318	110	1/318	1	48/161
Dibenz(A,H) Anthracene	0.00530-10.0	0.33	24/318	1.1	11/318	1,000	0/318
Dibenzofuran	0.00840-16.0	7	3/318	1,000	0/318	210	0/318
Fluoranthene	0.00760-490	100	1/318	1,000	0/318	1,000	0/318
Fluorene	0.0110-28.0	30	0/318	1,000	0/318	386	0/318
Indeno(1,2,3- C,D)Pyrene	0.00550-32.0	0.5	66/318	11	4/318	8.2	8/318

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NYSDEC WA D009803-24
HISTORICAL SOIL RESULTS SUMMARY

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG (ppm)[b]	Frequency Exceeding Unrestricted SCG	Industrial SCG (ppm)[c]	Frequency Exceeding Industrial SCG	Protection of Groundwater (PGW) SCG (ppm)[d]	Frequency Exceeding PGW SCG
Naphthalene	0.0110-9.70	12	0/318	1,000	0/318	12	0/318
Phenanthrene	0.00610-290	100	1/318	1,000	0/318	1,000	0/318
Phenol	0.0450-16.0	0.33	1/318	1,000	0/318	0.33	1/318
Pyrene	0.00920-310	100	1/318	1,000	0/318	1,000	0/318
Metals							
Arsenic	0.560-93.2	13	23/318	16	17/318	16	17/318
Barium	2.50-557	350	4/320	400	0/320	820	0/320
Beryllium	0.0840-6.70	7.2	0/318	2700	0/318	47	0/318
Cadmium	0.0420-29.0	2.5	14/320	60	0/320	7.5	4/320
Chromium, Total	3.40-1,040	30	106/318	800	0/318	19	0/318
Copper	1.90-4,850	50	68/318	10,000	0/318	1,720	4/318
Lead	1.20-2,950	63	51/320	3900	0/320	450	3/320
Manganese	61.3-7,310	1,600	29/318	10,000	0/318	2,000	19/318
Mercury	0.00820-6.60	0.18	25/320	5.7	1/320	0.73	6/320
Nickel	3.40-340	30	117/318	10,000	0/318	130	15/318
Selenium	0.460-11.3	3.9	4/320	6,800	0/320	4	4/320
Silver	0.240-9.80	2	2/320	6,800	0/320	8.3	1/320
Zinc	11.5-4,000	109	75/318	10,000	0/318	2,480	2/318
Pesticides/PCBs							
Total PCBs	0.055-260	0.1	143/304	25	8/304	3.2	52/304
Endrin	0.000031-0.000031	0.014	0/2	410	0/2	0.06	0/2
gamma-BHC (Lindane)	0.001-0.001	0.1	0/2	23	0/2	0.1	0/2
Heptachlor	0.00008-0.00008	0.042	0/2	29	0/2	0.38	0/2

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Industrial Use, unless otherwise noted.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

TABLE 2
TONAWANDA FORGE, SITE No. 915274
PRE-DESIGN INVESTIGATION WORK PLAN
NYSDEC WA D009803-24
HISTORICAL SURFACE WATER RESULTS SUMMARY

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Acetone	ND-4.9	50	0/2
Carbon disulfide	ND-0.44	60	0/2
SVOCs			
Anthracene	ND-0.54	3.8	0/2
Benzo(a)anthracene	ND-3.7	0.002	1/2
Benzo(a)pyrene	ND-5.6	0.0012	1/2
Benzo(b)fluoranthene	ND-11	0.002	1/2
Benzo(k)fluoranthene	ND-4.4	0.002	1/2
Chrysene	ND-6.8	0.002	1/2
Fluoranthene	ND-9.9	50	0/2
Indeno(1,2,3-cd)pyrene	ND-3.4	0.002	1/2
Phenanthrene	ND-3.3	5	0/2
Pyrene	ND-8.3	4.6	1/2
Inorganics			
Aluminum	ND-1,200	100	1/2
Barium	27-55	1,000	0/2
Chromium	ND-0.0036	50	0/2
Cobalt	ND-0.00097	5	0/2
Copper	6-11	14.6	0/2
Iron	300-24,600	300	1/2
Lead	ND-18	7	1/2
Magnesium	9,100-12,500	35,000	0/2
Manganese	36-290	300	0/2
Nickel	0.0048-7	84	0/2
Sodium	2,200-17,600	20,000	0/2
Vanadium	ND-0.0049	14	0/2
Zinc	5.5-220	134	1/2

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b -SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards.
ND: Non-detect

TABLE 3
TONAWANDA FORGE, SITE No. 915274
PRE-DESIGN INVESTIGATION WORK PLAN
NYSDEC WA D009803-24
SOIL SAMPLING RATIONALE

AOC	Name of AOC	Potential Sources / Releases	Most Likely Potential Mechanisms of Release	Evidence of PCB Release	Data Gap Assessment (PCBs)	Data Gap Assessment (SVOCs/Metals)	Proposed Soil Sample Locations	Default Soil Boring Sample Depths (feet bgs)	Rationale
A0C-1	ECM Area (Front Forty)	Industrial Landfill	Contaminated fill	176.2 ppm PCBs near ground surface at southern corner of area. Several locations with PCBs >50, but <100 ppm.	Limited surface soil data to determine cleanliness of existing cap. Some larger gaps without soil borings. Need to delineate below and around high-concentration results.	Concentrations of arsenic and benzo(a)pyrene above industrial SCOs. Additional surface soil samples needed along north and south arms and east of northern building.	21 soil borings, 10 Surface samples	0-1, 2-3, 4-5	The presence of PCB concentrations near and exceeding the 100 ppm maximum self-implementing cleanup criterion requires additional delineation horizontally and vertically. Fill has a high degree of variability and requires greater sample density than other areas to adequately characterize it. Characterize surface cover to better delineate extent of concentrations of arsenic and benzo(a)pyrene above industrial SCOs.
A0C-2	Former PCB Spill Area	Damaged electrical transformer	Surface PCB spill from damaged electrical box	25 ppm PCBs at 3-4 feet bgs in central area.	Three borings previously completed in the spill area with limited impacts and a couple other clean samples.	Delineation appears adequate.	1 surface sample	* See below	No likely sources outside of spill area and impacts in spill area are limited. Surface sample in area of spill to assess utility of surface cover as part of cap material.
A0C-3	Relay Rod Area	Oil pits, relay rod area, trenches	Surface contamination from trenches and oil pits.	PCB concentrations <25 ppm throughout.	Good sample coverage with limited PCB impacts and no major PCB source identified.	Delineation appears adequate.	None	NA	AOC adequately characterized.
A0C-4	Machine Repair Area	Drains in machine and truck repair areas with oil	Surface spills, except possibly in sump in truck repair area	A sample collected in 1998 from within the sump in the truck repair area showed PCBs >50 ppm.	Soil samples were collected around the truck repair area sump and PCBs were not detected. Samples collected around one of two oil-filled machine repair area drains.	Delineation appears adequate.	2 soil borings	8-10, 10-12	Characterize the unsampled oil-filled machine repair area drain and characterize deep soils near the 9-foot deep truck repair sump.
A0C-5	Basement & Quench Oil Pump Pits	Backfilled oil pump pits.	Subsurface spill from oil pump pits and potentially contaminated backfill	PCBs detected at less than 1 ppm in 1 of 17 samples.	All the samples are all ND or below the most conservative self-implementing cleanup criteria.	Delineation appears adequate.	None	NA	Borings sufficiently cover the area of the AOC. No further sampling needed.
A0C-6	Waste Treatment Area, Sewer Lift Station & Waste Storage Area	Waste disposal AST	Surface spill from AST	PCBs detected in 2 of 12 samples at a maximum concentration of 3.2 ppm.	Limited evidence of PCB impacts in shallow samples. No evidence of deeper impacts.	Delineation appears adequate.	1 surface sample	* See below	Concrete sample to assess PCB concentrations at ground surface beneath former AST where PCBs were previously detected from 1.5 to 2 feet bgs.
A0C-7	Environmental Building (Former oil Pump)	Oil pump house UST and hazardous waste storage area	Surface spills from waste storage area.	PCBs detected in 8 of 10 samples with 5 results > 1 ppm. 17 ppm PCBs found at 4-4.5 feet bgs All other detections below 5 ppm.	No samples on east side of building near highest concentration of PCBs.	Delineation appears adequate.	2 soil borings	0-0.5, 1-1.5, 3-4, 5-6	Characterize known storage area and delineate around highest detection to verify compliance with self-implementing cleanup objectives.
A0C-8	Oil USTs / C&D Pile	UST and C&D debris pile	Surface from C&D material pile or subsurface spill from UST.	25ppm PCBs found at 3'-4' depth	Former UST farm and building in AOC-8 lack data in the southwest corner of the AOC. Data is needed to improve vertical delineation and contamination extents. Specifically AOC-08-S-TT-X01, AOC-08-GP-02, show contamination exceedances at 4'-5' and no deeper samples in the same locations.	Delineation appears adequate.	4 soil borings	0-0.5, 1-1.5, 2-3, 4-5, 6-7	Four samples on a grid of 20ft is proposed to investigate around the >50 ppm PCB result at AOC-08-GP-02.
A0C-9	Railroad Spur & Soil Waste Accumulation Area	Railroad & soil waste accumulation area	Surface contamination from waste accumulation area. Surface release from railroad.	PCBs detected at concentrations greater than 1 ppm in 7 of 26 samples, all at depths of 1 to 5 feet bgs with a maximum concentration of 13 ppm. NAPL observed at northeast end of area with >100 ppm PCBs.	Delineation appears adequate. Surface samples do not indicate the presence of PCBs over the most conservative self-implementing cleanup criteria.	Need to further delineate extent of SVOCs and metals around GP-05.	2 soil borings 3 surface samples	1 to 2 feet above and 1 to 2 feet below water table	PCB delineation sufficient, but soil concentrations for soil in contact with NAPL requires characterization and delineation.Delineate extent of SVOCs and metals around GP-05.

TABLE 3
TONAWANDA FORGE, SITE No. 915274
PRE-DESIGN INVESTIGATION WORK PLAN
NYSDEC WA D009803-24
SOIL SAMPLING RATIONALE

AOC	Name of AOC	Potential Sources / Releases	Most Likely Potential Mechanisms of Release	Evidence of PCB Release	Data Gap Assessment (PCBs)	Data Gap Assessment (SVOCs/Metals)	Proposed Soil Sample Locations	Default Soil Boring Sample Depths (feet bgs)	Rationale
A0C-10	Berm Area	Used oil AST, cutting-oil covered swarf materials	Surface spill, release from adjacent railroad spur to the northeast	Previous investigation and remediation of PCB-impacted soils. 48 ppm PCBs present from 1 to 1.5 feet bgs along southeastern edge of berm area.	Additional shallow data needed, especially around elevated detection and along eastern edge of berm area needed.	Delineation appears adequate.	6 soil borings 2 surface samples	0-0.5, 1-1.5, 3-4	Delineate around sample with elevated PCB concentrations. Improve surface soil characterization in areas of known impacts.
A0C-11	Railroad Spur	Railroad equipment and materials	Surface spills	PCBs detected in surface soil over much of this area. PCB concentrations >100 ppm detected in NAPL in this area and detected in subsurface soil sample along rail line immediately southeast of site.	Generally good coverage, although additional assessment of surficial soil desirable to ensure 25 ppm cleanup criterion met and delineation around NAPL.	Additional delineation is needed near AOC-11-GP-01.	4 soil borings 1 surface sample	1 to 2 feet above and 1 to 2 feet below water table	Evaluate PCB concentrations around area with NAPL and near areas where PCBs are observed in surface soils in steel yard. Evaluate extent of subsurface SVOC soil contamination around previous boring AOC-11-GP-01.
A0C-12	Steel Yard	Steel yard, storage of swarf material.	Surface contamination from residual cutting oils on swarf.	Previous investigations indicated that the presence of PCBs in subsurface soils (BB&L, December 1998) was attributed to the historic storage of swarf material in the area	Data is needed to delineate vertical and horizontal extent of material containing PCBs greater than 100 ppm.	Delineation is needed at several locations to better define horizontal extent of surface soil contamination.	12 soil borings 3 surface samples	0-0.5, 1-1.5, 3-4	10 soil borings to delineate around 100 mg/kg detections. 2 soil borings for better general coverage of area with potentially randomly distributed sources of PCBs. Additional data is needed to delineate the extent of SVOCs and metals at 6 locations.
A0C-13	Front Forge / Hot Formers	Substation, shears and presses and drains.	Surface releases from transformers, surface and subsurface releases from shears and presses.	Samples of oil collected by GES from this area indicated the presence of PCBs. One sample of soil contained PCBs at 54 ppm. PCB concentrations of 430 ppm detected in NAPL.	Additional soil data is needed to delineate around >50 ppm sample and around NAPL. Additional data needed near former pits and catchbasins around shears and presses.	Delineation appears adequate.	11 Soil borings 3 surface samples	0-0.5, 1-1.5, 3-4 for 9 borings and 1 to 2 feet above and below water table near NAPL well	Additional PCB data is needed in former substation and transformer yard and near the gear presses and shears. Sample locations in substation area should be adjusted based on field observations.
A0C-14	Former Die Room / C&D Pile	C&D pile Subsurface utilities	Surface spill, subsurface spill	Oily C&D pile removed in 2016. NAPL containing PCBs at 270 ppm identified in subsurface.	Soil data needed near the monitoring well to assess the extent of NAPL. Data needed in footprint of former C&D pile.	Delineation appears adequate.	2 soil borings 6 surface samples	1 to 2 feet above and 1 to 2 feet below water table	Soil borings to characterize potential C&D pile PCB residue and to characterize soil around NAPL.
A0C-15	General Stores / Metal Lab Area	Laboratory, drill presses	Surface spill/subsurface spill from drill press sumps	PCB-containing wood block with black staining was observed within this area. Detection of 260 ppm PCBs along northwestern edge of area.	Need additional data near wood block and drill press sump that contained oil. Delineation around elevated PCB detection.	Delineation appears adequate.	5 soil borings 1 surface sample	0-0.5, 1-1.5, 3-4	Delineate around PCB sample collected near floor drain at 1'-1.5' that contained >100 ppm PCBs. Characterize floor benath former stained wood brick flooor.
Other	Loading Docks	Hydraulic lifts	Subsurface release of hydraulic oil possible.	No data exist.	No data exist.	Delineation appears adequate.	6 soil borings	0-0.5, 1-1.5, 3-4, 6-8	4 borings between hydraulic lifts. 2 at hydraulic oil reservoirs.
A0C-16	300 Ton Press & Cold Headers Area / C&D	Pile of C&D material, press	Surface spill from C&D pile. Release from press.	40 ppm detected in boring near former press.	Additional borings to delineate extent of PCBs around former presses.	Delineation appears adequate.	2 soil borings 3 surface samples	0-0.5, 1-1.5, 3-4	Borings to vertically delineate detected PCBs and to assess for potential of higher concentrations. Surface samples to assess C&D pile area.

Notes:
* Surface samples for PCBs to be collected from 0 to 0.5 feet bgs in soil and 0 to 0.25 inches deep in concrete. Aliquots for SVOCs, TAL Metals, and Mercury to be collected between 0 and 2 feet. VOC aliquots to be collected at discrete 1 foot intervals.
Samples identified above represent the primary mobilization to further characterize extent of impacts. A second mobilization is anticipated to complete delineation where necessary.

TABLE 4
TONAWANDA FORGE SITE PRE-DESIGN INVESTIGATION
SEWER WATER, SEWER SEDIMENT, AND LNAPL SAMPLING RATIONALE
OCTOBER/NOVEMBER 2020 MANHOLE, CATCH BASIN, AND DRAINAGE INLET INVENTORY

Location ID	Date	Comment	DTW (inches)	Sediment Thickness (inches)	Description	Proposed Sampling Rationale
Manholes						
MH-15	11/13/2020	Accessible	18.5	3	No visible pipe. Total depth 11.5'	
MH-16	10/27/2020	Accessible	16	NA	Total depth >10.5', heavy sheen, no pipes visible	Heavy sheen present before and after disturbing sediment
MH-16A	10/23/2020	Unable to open (bolted down)	NA	NA	Allen key screws rusted/stripped	
MH-17	10/23/2020	Accessible	23	2	Total depth 114"	
MH-17A	10/23/2020	Accessible	23	0	Total depth 118", no visible pipes	
MH-18	10/23/2020	Unable to open, submerged	NA	NA	NA	
MH-23-2	10/27/2020	Could not locate	NA	NA	NA	
MH-51	10/21/2020	Accessible	17	2	Total depth 9'8", no visible pipes (historic high PCB's)	Historic high PCB's
MH-52	10/23/2020	Unable to locate	NA	NA	NA	
MH-53	10/22/2020	Accessible	21		Total depth >10'10", no visible pipes (historic high PCB's)	Historic high PCB's
MH-53-1	10/27/2020	Could not locate	NA	NA	NA	
MH-53-2	10/22/2020	Accessible	22	1	Total depth 125", 4" pipe w/ 24" invert (historic high PCB's)	Historic high PCB's
MH-53-3	10/23/2020	Unable to open (bolts rusted in place)	NA	NA	PCBs ≥100 ppm	
MH-55	10/27/2020	Accessible	26	NA	Total depth >11'2", 6" pipe, unk invert	
MH-56	10/23/2020	Accessible	25	NA	Total depth >11'2", 4" steel pipe w/ 31" invert, 6" elbow pipe	
MH-57	10/23/2020	Accessible	25	NA	Total depth >11'2", sheen, 4" steel pipe w/ 26" invert	
MH-58	10/22/2020	Accessible	29		Total depth >11'6", minor sheen (historic high PCB's)	Historic high PCB's
MH-58-1	11/18/2020	Could not locate	NA	NA	Possibly destroyed. In rubble area.	
MH-59	10/21/2020	Accessible, oil present	22	2	LNAPL, total depth 10'4", no visible pipes. 3-4' of LNAPL present	
MH-60	10/21/2020	Accessible	26	3	Total depth 9'2", 8" pipe w/ 48" invert (historic high PCB's)	Historic high PCB's
MH-62	10/22/2020	Accessible	24	NA	Total depth >11'2", 4" steel pipe w/ 31" invert	
MH-63	10/23/2020	Accessible, cracked lid, did not open	NA	NA	NA	
MH-64	10/23/2020	Accessible w/ broken lid	14.5	2	Total depth 9', oily substance on water surface	Historic high PCB's
MH-66	10/27/2020	Accessible	28	NA	Total depth >11', sheen, no visible pipes	
MH-68	10/22/2020	Unable to open	NA	NA	Silver cover seal w/ screws	
MH-78	10/27/2020	Accessible	33	2	Total depth 134", 31" pipe leads to 34" square manway w/ 12" sealed pipe	
MH-83B					middle of Back 40, need sample for spacial distribution	Spacial distribution
MH-86					north corner of back 40, need sample for spacial distribution	Spacial distribution
MH-100	10/27/2020	Accessible	40	3	No visible pipes. Total depth 70"	
MH-101	10/27/2020	Unable to open	NA	NA	NA	
MH-102	10/27/2020	Accessible	NM	NM	Total depth > 12', sheen, some sediment. Oil/water separator w/ mechanicals in vault.	Spacial distribution
MH-103	10/27/2020	Accessible	8		Total depth >10.5', raised cap; next to former waste treatment plant	
MH-104	10/27/2020	Accessible	60		Total depth >12', 6" pipe w/ invert	
MH-105	10/27/2020	Accessible/unable to open	NA	NA	40" cover opens to 6' pipe, sealed in place	
MH-106	10/27/2020	Accessible	12	3-4	Total depth 45", cover grown in w/ vegetation and fabric	
MH-107	10/27/2020	Accessible	14	4-6	Total depth 98", slight sheen, no visible ladder or pipes	Sheen on water when sediment was disturbed
MH-108	10/22/2020	Accessible	23	63.5	Total depth 78", no LNAPL seen, 4' pipe w' 28" invert (historic LNAPL)	Historic high PCB's
MH-109	11/18/2020	Unable to open, bolts wouldn't fully come out.	NA	NA	NA	
MH-110	10/23/2020	Accessible, missing lid, replaced lid on 11/15/2013	18.5	2	Total depth 102.5", no visible pipes	
MH-111	10/27/2020	Could not locate	NA	NA	NA	
MH-112	10/22/2020	Accessible	24	1	Total depth 86.5", 1 x 4" pipe w/ 28" invert, 1 x 12" pipe w/ 33" invert, 1 x 6" w/ 48" invert	
MH-113	10/23/2020	Accessible	21	2	Total depth 36", sheen/oily odor, 2 x 12" pipes w/ 30" invert	Sheen and oily odor present before and after disturbing sediment
MH-114	10/23/2020	Unable to open	NA	NA	Allen key screws rusted/stripped	
MH-115	10/27/2020	Could not locate	NA	NA	Covered by concrete or destroyed	
MH-116	10/27/2020	Could not locate	NA	NA	Covered by concrete or destroyed	
MH-117	10/23/2020	Accessible	Dry	3	Total depth 27", 6" pipe w/ 18" invert	
MH-118	10/23/2020	Unable to open, submerged	NA	NA	NA	
MH-119	10/23/2020	Accessible, oil present	18	3	87" to soft bottom, no visible pipes. About 8" of LNAPL present.	8" of LNAPL present, confirm ND for PCBs
MH-120	10/23/2020	Accessible, oil present	18	2	Brick-lined covered in product, total depth 64", no visible pipes. About 6" pf LNAPL present	6" of LNAPL present, sampled in RI, 430 ppm PCBs.

TABLE 4
TONAWANDA FORGE SITE PRE-DESIGN INVESTIGATION
SEWER WATER, SEWER SEDIMENT, AND LNAPL SAMPLING RATIONALE
OCTOBER/NOVEMBER 2020 MANHOLE, CATCH BASIN, AND DRAINAGE INLET INVENTORY

Location ID	Date	Comment	DTW (inches)	Sediment Thickness (inches)	Description	Proposed Sampling Rationale
MH-121	10/23/2020	Accessible, oil present	18	4	77" to soft bottom, no visible pipes. About 3" of LNAPL present	3" of LNAPL present
MH-122	10/22/2020	Accessible	16	1	Total depth 77", no visible pipes	
MH-123	10/22/2020	Accessible	17	2	Total depth 8'7", end of 24" depth opens to vault, sheen/bubbles	
MH-124	10/23/2020	Unable to open, bolted down	NA	NA	NA	
MH-125	10/23/2020	Accessible	16	17	total depth 62.5", 4" elbow pipe	Spacial distribution
MH-126	10/23/2020	Accessible	Dry	4	PCBs ≥100 ppm, total depth 26", 2 x 6" pipes w/ 21" invert	
MH-127	10/27/2020	Could not locate	NA	NA	NA	
MH-128	10/22/2020	Accessible	15	18	Total depth 65", 6" pipe w/ 39.5" invert (historic high PCB's)	Historic high PCB's
MH-129	10/23/2020	Accessible	24	2	Total depth 62", 2" pipe 16-18" elbow below surface, 4" pipe w/ 24" invert	
MH-130	10/23/2020	Unable to open, lid pinched shut on rim	NA	NA	NA	
MH-131	10/21/2020	Unable to open	NA	NA	NA	
MH-132	10/21/2020	Accessible	16	2	Total depth 63", slight sheen, 2" steel pipe w/ elbow (historic high PCB's)	Historic high PCB's
MH-133	10/21/2020	Accessible	16	2	2" steel pipe with elbow. Total depth : 63"	
MH-134	10/21/2020	Accessible	13	2	Total depth 24", 4" PVC pipe	
MH-135	10/21/2020	Accessible	15.5	11	No visible ladder/pipes, reddish/oily sheen	
MH-136	10/23/2020	Accessible, filled w/ concrete debris to top	NA	NA	17" to bottom	
MH-137	10/23/2020	Accessible, broken lid, replaced lid on 11/20/2013.	Dry	7	14" to sediment, 6" pipe w/ 14" invert	
MH-200	10/21/2020	Accessible	20	2	Total depth 88", no visible pipes	
MH-201	11/6/2020	NA	NA	NA	middle of main parking lot, need sample for spacial distribution	Spacial distribution
MH-1608	10/21/2020	Accessible	15	1	Total depth 66"	
MH-1629	10/22/2020	Unable to open, partially seal w/ concrete	NA	NA	NA	
Catch Basins						
CB-1	10/27/2020	Accessible	18	6	Total depth 36", 2 x 8" pipes at bottom, invert at bottom, sheen	
CB-2	10/27/2020	Accessible	18	2	Total depth 36", 2 x 6" pipes at bottom	
CB-3	10/27/2020	Accessible	14	2	Total depth 67"	
CB-4	10/27/2020	Accessible	40	2-3	Total depth 70", no visible pipes	
CB-5	10/27/2020	Accessible	36	10	Total depth 54"	
CB-6	10/27/2020	Accessible	38	5	Total depth 50", invert 50", sheen, 8" steel pipe w/ 39" invert	
CB-7	10/27/2020	Accessible	45	3-4	Invert 60", sheen, 6" PVC pipe, 3 x 10" corregated pipes, invert 60"	
CB-8	10/27/2020	Accessible	NA	8	Total depth 60", cover grown in w/ veg	
CB-9	10/27/2020	Accessible	NA	4-6	Total depth 60", cover grown in w/ veg	
CB-10	10/27/2020	Accessible	8	2-4	Total depth 24"	
CB-11	10/27/2020	Accessible	NA	NA	Filled in with vegetation/ sediment	
CB-12	10/27/2020	Accessible	Dry	>48	Total depth 54"	
CB-13	10/27/2020	Accessible	NA	NA	Filled in with vegetation/ sediment	
CB-14	11/18/2020	Accessible	19	10	6" steel pipe w/ 20" invert. Total depth: 35"	
CB-15	10/27/2020	Accessible	27	2	Total depth 43"	
CB-16	11/18/2020	Accessible	29	3	4" PVC w/ 42.5" invert. Vertical 4-6" pipe. Total depth 65"	
CB-17	10/22/2020	Accessible	19	10	1 X 6" pipe w/ 22" invert, 1 x 12" pipe w/ 33" invert	
CB-18	11/18/2020	Accessible	15	8	8" pipe w/ 19.5" invert. Total depth: 34"	
CB-19	11/18/2020	Could not locate	NA	NA	Dsestroyed/ could not locate. In rubble area	
CB-20	10/27/2020	Accessible	Dry	34"	Total depth 46", 4" pipe to 3" pipe (vertical)	
CB-21	10/22/2020	Accessible	10.5	19.5	Total depth 70.5", possible 8" pipe, bubbles and sheen	
CB-22	10/22/2020	Accessible	13.5	23	No visible pipes	
CB-23	10/27/2020	Accessible	16	8"	Total depth 64", sheen	
CB-24	10/27/2020	Could not locate	NA	NA	NA	
CB-25	10/27/2020	Accessible	15	1	Total depth 58", sheen, drain pipe 15"	
CB-26	10/21/2020	Accessible	18	21	Total depth 43", 6" steel pipe	
CB-27	10/22/2020	Accessible	22	6	Total depth 77", 8" elbow pipe w/ 24" invert, 1.5" standpipe on elbow pipe. Sheen present	
CB-28	10/21/2020	Accessible	17	9	Total depth 42", sheen, 6" steel pipe	

TABLE 4
TONAWANDA FORGE SITE PRE-DESIGN INVESTIGATION
SEWER WATER, SEWER SEDIMENT, AND LNAPL SAMPLING RATIONALE
OCTOBER/NOVEMBER 2020 MANHOLE, CATCH BASIN, AND DRAINAGE INLET INVENTORY

Location ID	Date	Comment	DTW (inches)	Sediment Thickness (inches)	Description	Proposed Sampling Rationale
CB-29	10/27/2020	Accessible	10	8	Total depth 89", sheen, possible 4-6" pipe w/32" invert	
CB-30	10/27/2020	Accessible	10	5	Total depth 86", slight sheen, possible 4-6" pipe	
CB-31	10/21/2020	Accessible	17	23	Total depth 43", sheen and bubbles on water, 6" steel pipe	
CB-32	10/27/2020	Accessible.	NA	NA	Completely filled in w/ sediment and vegetation	
CB-33	10/21/2020	Accessible	22	2	Total depth 9'2", sheen on water, bushes/vegetation grown in	
CB-34	10/21/2020	Accessible	NA	19	Total depth unk, overgrown w/ vegetation	
CB-35	10/21/2020	Accessible	NA	3	Submerged. Total depth 93"	
CB-36	10/27/2020	Accessible, filled to top with water/sediment.	NA	NA	Total depth 24"	
CB-37	10/27/2020	Accessible	NA	NA	Filled to top with sediment.	
CB-38	10/27/2020	Inaccessible	NA	NA	Completely filled in w/ sediment and vegetation	
CB-39	10/27/2020	Could not locate	NA	NA	NA	
CB-40	10/27/2020	Accessible	NA	NA	Filled to top with sediment.	
CB-41	10/27/2020	Accessible	10	8	Total depth 30", PCBs≥100 ppm	
CB unknown #	TBD	TBD	NA	NA	In front of Administration Building, west of MH-310	Spacial distribution
Drainage Inlets						
DI-1	10/21/2020	Accessible	28	5	Total depth 48", 6" PVC pipe. Sheen present	
DI-2	10/21/2020	Accessible	23	3	Total depth 47", 6" PVC pipe. Sheen present	
DI-3	10/21/2020	Accessible	24	1	Total depth 60", 6" PVC pipe. Sheen present	
DI-4	10/21/2020	Accessible	13	4	Total depth 62", no visible pipes	
DI-5	10/21/2020	Accessible	11	6	Total depth 47", 6" PVC pipe. Sheen present	
DI-6	10/21/2020	Accessible	17.5	2	Total depth 47", 6" PVC pipe w/ 30" invert. Sheen present	
DI-8	10/21/2020	Accessible	10.5	2	Total depth 47", 2 x 6" pipes. Sheen present	
DI-9	10/21/2020	Accessible	11.2	5	Total depth 60", 6" PVC pipe w/ 42" invert	

TABLE 5
TONAWANDA FORGE, REMEDIAL DESIGN, SITE No. 915274
NYSDEC WA D009803-24
SAMPLE ANALYTICAL PROGRAM

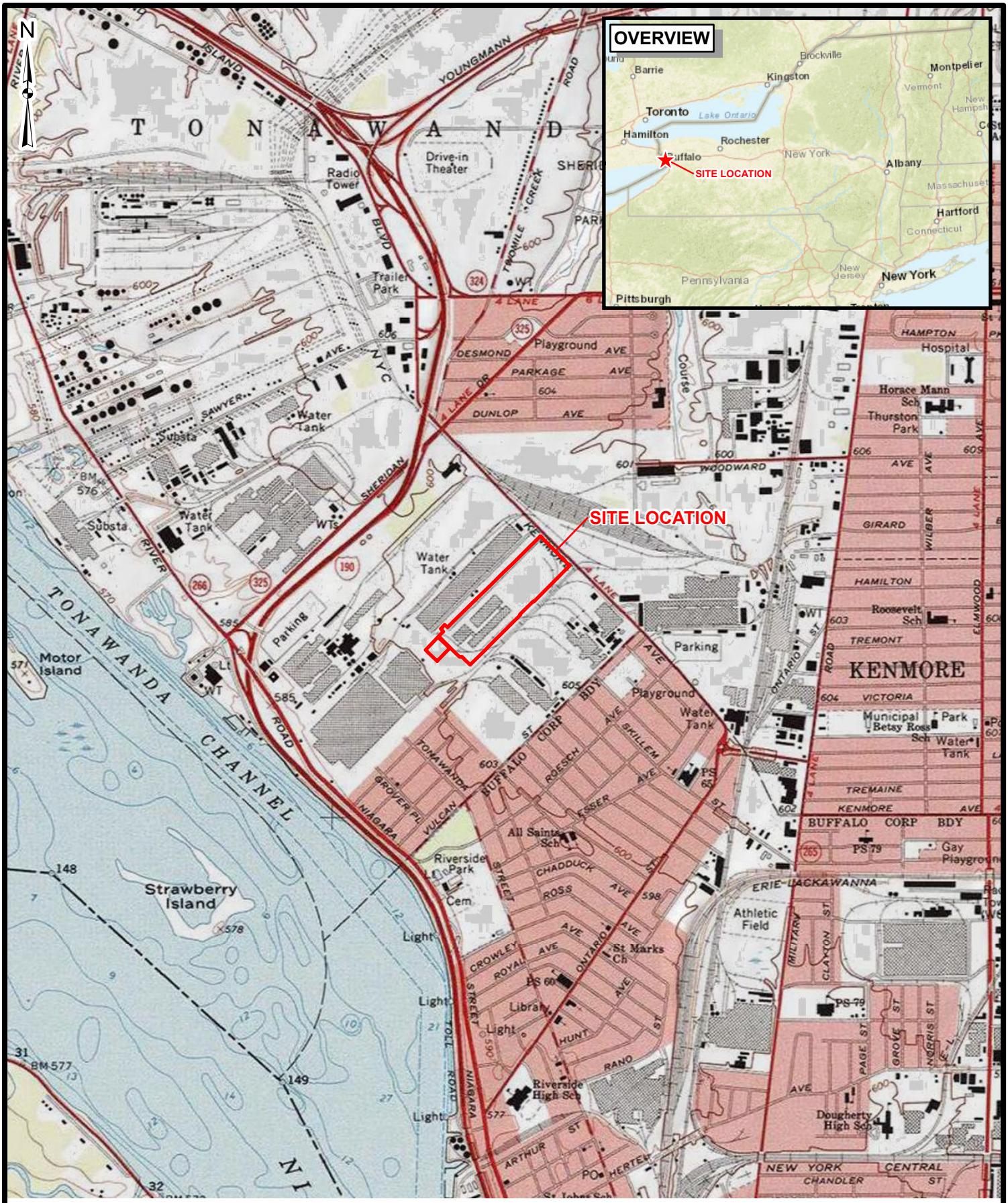
Analytical Methods*	Samples	QC				Total No of Samples
		Field Dup	MS	MSD	Trip Blank	
SOILS - Direct Push Soil Borings						
TCL Volatiles + 10 TICs by 8260C	20	1	1	1	0	23
TCL Semivolatiles + 20 TICs by 8270D	20	1	1	1	0	23
TCL PCBs by 8082A	325	16	16	16	0	373
TAL Metals by 6010C	20	1	1	1	0	23
Mercury by 7471A	20	1	1	1	0	23
Full TCLP	2	0	0	0	0	2
Ignitability by 1030	2	0	0	0	0	2
Corrosivity by 9045C	2	0	0	0	0	2
Reactivity by Chaper 7 Section 7.3	2	0	0	0	0	2
SOILS - Test Pits						
TCL Volatiles + 10 TICs by 8260C	9	1	1	1	1	13
TCL Semivolatiles + 20 TICs by 8270D	9	1	1	1	1	13
TCL PCBs by 8082A	24	1	1	1	0	27
TAL Metals by 6010C	9	1	1	1	1	13
Mercury by 7471A	9	1	1	1	1	13
Full TCLP	2	0	0	0	0	2
Ignitability by 1030	2	0	0	0	0	2
Corrosivity by 9045C	2	0	0	0	0	2
Reactivity by Chaper 7 Section 7.3	2	0	0	0	0	2
LNAPL						
TCL PCBs by 8082A	2	0	0	0	0	2
TCL VOCs + 10 TICs by 8260C	2	0	0	0	0	2
TCL Semivolatiles + 20 TICs by 8270D	2	0	0	0	0	2
TAL Metals by 6010C	2	0	0	0	0	2
Mercury by 7471A	2	0	0	0	0	2
Density by ASTM D2937	2	0	0	0	0	2
BTU by ASTM D240	2	0	0	0	0	2
Fuel Fingerprint by 310-14	2	0	0	0	0	2
Ignitability by 1010	2	0	0	0	0	2
pH by 9045C	2	0	0	0	0	2
Reactivity	2	0	0	0	0	2
Sewer Water (16) and Surface Water (5)						
PP Volatiles by 624.1	21	1	1	1	3	27
PP Semivolatiles by 625.1	21	1	1	1	0	24
PP Pesticides/PCBs by 608.3	21	1	1	1	0	24
PP Metals by 200.8	21	1	1	1	0	24
Dissolved Metals by 200.8	21	1	1	1	0	24
Mercury by 245.1	21	1	1	1	0	24
Dissolved Mercury by 245.1	21	1	1	1	0	24
Cyanide by 9012B	21	1	1	1	0	24

TABLE 5
TONAWANDA FORGE, REMEDIAL DESIGN, SITE No. 915274
NYSDEC WA D009803-24
SAMPLE ANALYTICAL PROGRAM

Analytical Methods*	Samples	QC				Total No of Samples
		Field Dup	MS	MSD	Trip Blank	
Sewer Water (16) and Surface Water (5), Continued						
Hexavalent Chromium by 218.6	9	1	0	0	0	10
Alkalinity, Total by 310.1	9	1	0	0	0	10
Biochemical Oxygen Demand (BOD) by SM5210B	9	1	0	0	0	10
Chemical Oxygen Demand (COD) by 410.4	9	1	0	0	0	10
Flash Point by 1010A	9	1	0	0	0	10
Hardness by 130.1	9	1	0	0	0	10
Oil & Grease by 1664B	9	1	0	0	0	10
Phenolics, Total Recoverable by 420.1	9	1	0	0	0	10
Total Dissolved Solids by 160.1	9	1	0	0	0	10
Total Suspended Solids by SM4500D	9	1	0	0	0	10
Nitrate by 300.0	9	1	0	0	0	10
Nitrite by 300.0	9	1	0	0	0	10
Sulfate by 375.4	9	1	0	0	0	10
Total Kjeldahl Nitrogen by 351.2	9	1	0	0	0	10
Ammonia by 350.2	9	1	0	0	0	10
pH by 150.2	9	1	0	0	0	10
Sewer Sediment (16)						
TCL Volatiles + 10 TICs by 8260C	16	1	1	1	0	19
TCL Semivolatiles + 20 TICs by 8270D	16	1	1	1	0	19
TCL PCBs by 8082A	16	1	1	1	0	19
TAL Metals by 6010C	16	1	1	1	0	19
Mercury by 7470A	16	1	1	1	0	19
Cyanide by 9012B	8	1	1	1	0	11
Full TCLP	8	0	0	0	0	8
Ignitability by 1010	8	0	0	0	0	8
Corrosivity	8	0	0	0	0	8
Reactivity	8	0	0	0	0	8
Concrete Chips, Brick Chips (25) and Wipes (10)						
TCL PCBs by 8082A	35	4	0	0	0	39

MS - Matrix Spike.
MSD - Matrix Spike Duplicate.
PCBs - Polychlorinated biphenyls.
RCRA - Resource Conservation and Recovery Act.
Full TCLP includes Volatiles, Semivolatiles, Pesticides, Herbicides and Metals.
PP - Priority Pollutant.
TAL - Target Analyte List.
TCL - Target compound List.
TCLP - Toxicity Characteristics Leaching Procedure.
TICs - Tentatively Identified Compounds.
* Unit rates based on AECOM D009803 standby rates with Eurofins TestAmerica

FIGURES



Sources: © 2013 National Geographic TOPO!
ESRI World Street Map

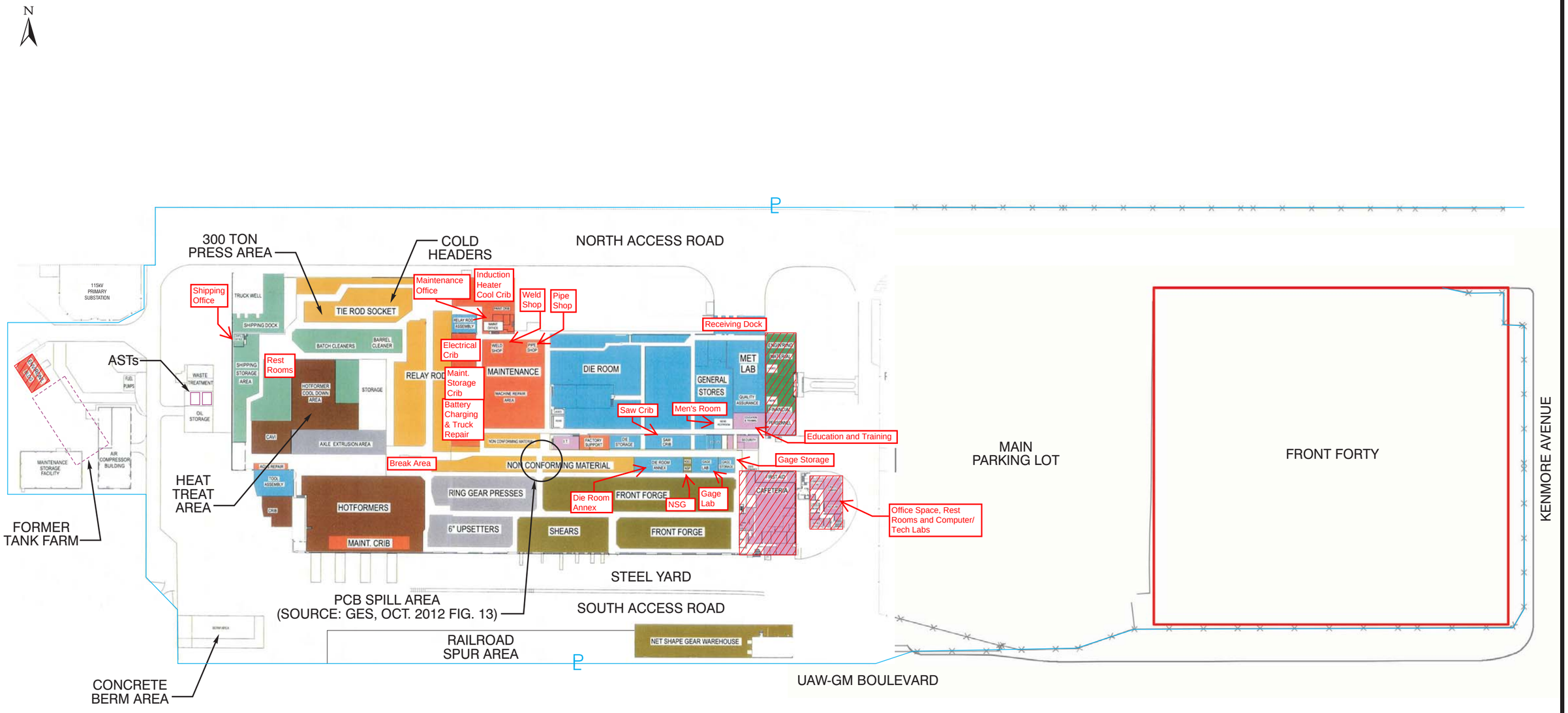
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AECOM

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
SITE LOCATION

FIGURE 1

J:\Projects\11176989\GIS\MAPS\FS\01-01 SITE LOCATION.mxd 4/17/2018



- Existing Structures

P - Approximate Property Line

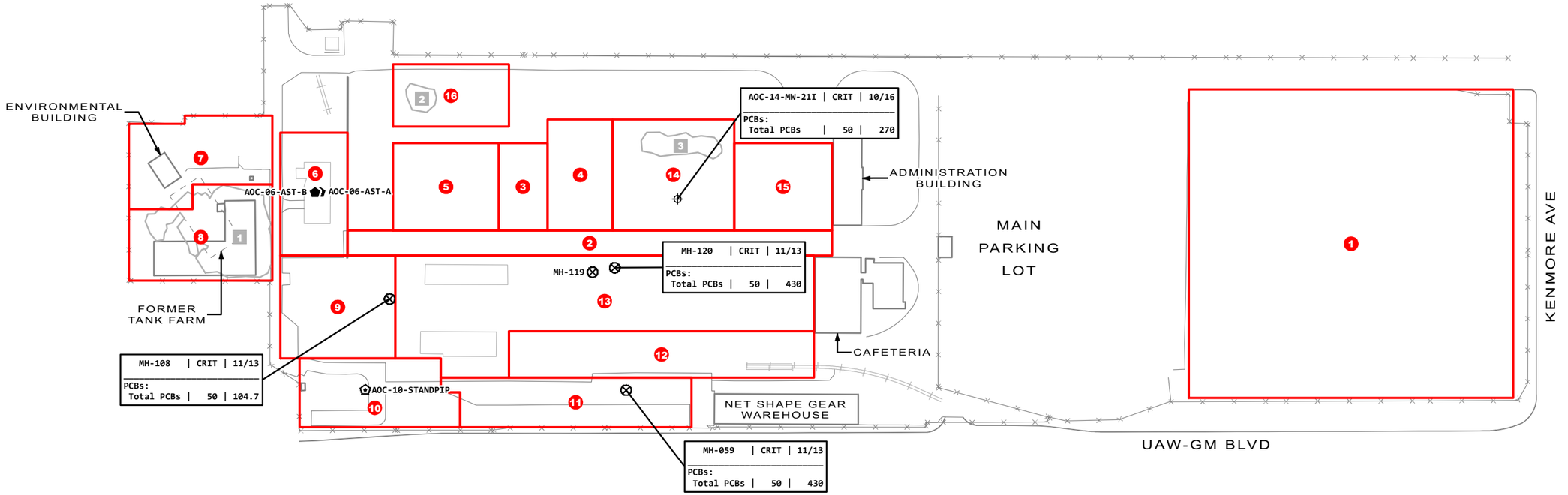
NOTES: Not to scale.
SOURCE: AAM 02/05/2001 Emergency Evacuation and Shelter Plan

AG20961-11176989-051514-GCM

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
HISTORICAL SITE PLAN

AECOM

FIGURE 2



Legend

- AST Sample
- Standpipe Sample
- Manhole
- Monitoring Well
- Area of Concern
- Debris/Waste Pile (Removed Feb. 2016)

Notes: Units are in µg/L; Locations shown without results indicate that no compounds exceeded criteria
Criteria: 40 CFR Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions, and 6 NYCRR Part 371.4 (e)

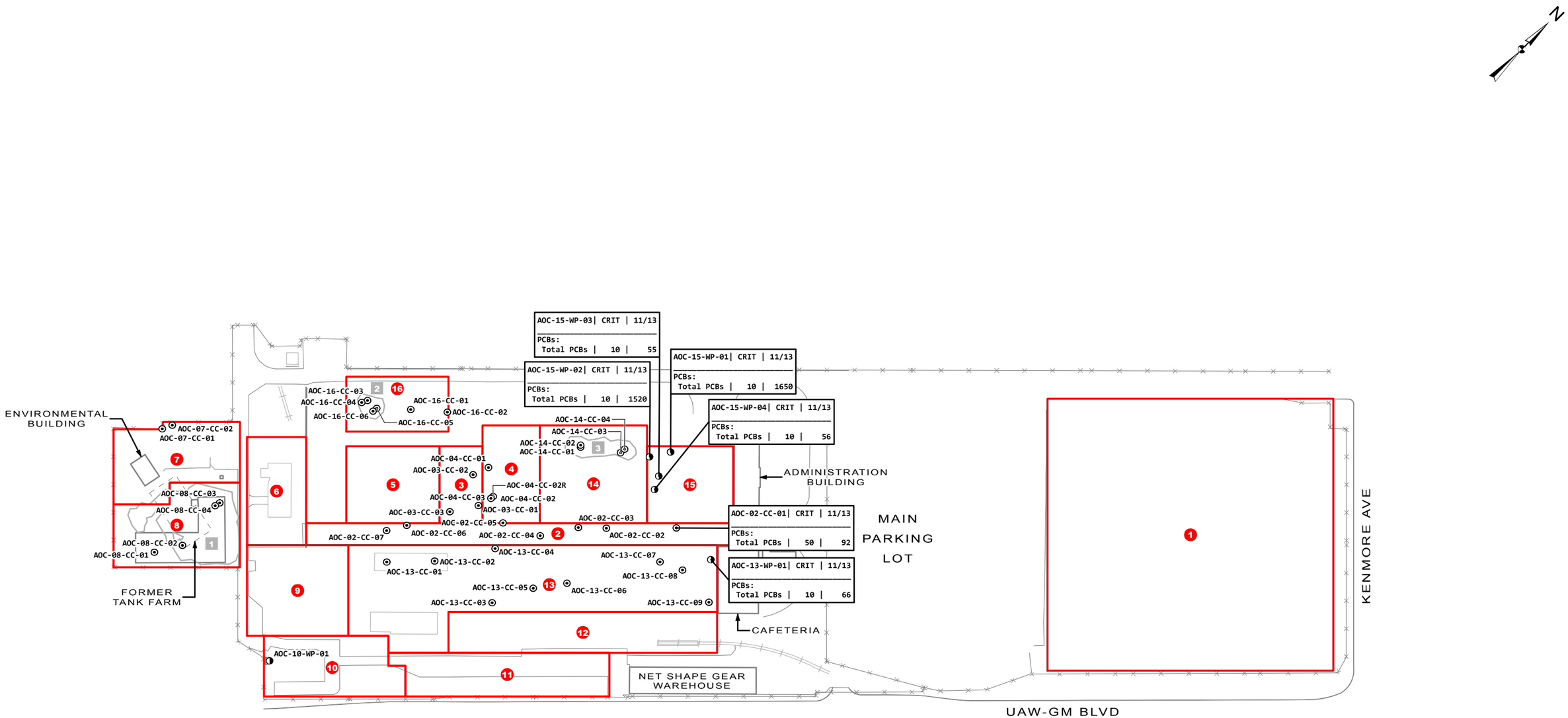
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NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
NON-AQUEOUS PHASE LIQUID
ANALYTICAL RESULTS

AECOM

FIGURE 3A

J:\Projects\11176989\GIS\MAPSIR\ PHASE 2\04-02 NAPL ANALYTICAL.mxd 5/22/2017



Legend

- Chip Sample (Concrete, Brick, & Asphalt)
- Wipe Sample
- Area of Concern
- Debris/Waste Pile (Removed Feb. 2016)

Notes: Units are in mg/kg, except for Wipe Samples, which are in µg/wipe; Locations shown without results indicate that no compounds exceeded criteria

Criteria: 40 CFR Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions, and 6 NYCRR Part 371.4 (e)

200 0 200 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
CONCRETE AND ASPHALT CHIP, BRICK, & WIPE SAMPLES PCB ANALYTICAL RESULTS

AECOM

FIGURE 3B

J:\Projects\11176989\GIS\MAPS\RI PHASE 2\04-04 MISC ANALYTICAL.mxd 6/5/2017

ENVIRONMENTAL BUILDING

FORMER TANK FARM

ADMINISTRATION BUILDING

CAFETERIA

NET SHAPE GEAR WAREHOUSE

CB-06	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	2.5
Benzo(b)fluoranthene	1	11	1.7	3.1
Chrysene	1	110	1	3.3
PCBs:				
Total PCBs	0.1	25	3.2	1.57
Metals:				
Antimony	12	--	--	17.4
Cadmium	2.5	60	7.5	3.4
Calcium	10000	--	--	68200
Chromium	30	6800	--	375
Copper	50	10000	1720	271
Iron	2000	--	--	394000
Lead	63	3900	450	918
Manganese	1600	10000	2000	1640
Nickel	30	10000	130	121
Zinc	109	10000	2480	1030

CB-04	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	2.3
Benzo(a)pyrene	1	1.1	22	1.9
Benzo(b)fluoranthene	1	11	1.7	2.2
Benzo(k)fluoranthene	0.8	110	1.7	1.5
Chrysene	1	110	1	3.1
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	1.6
PCBs:				
Total PCBs	0.1	25	3.2	45.7
Metals:				
Arsenic	13	16	16	22.7
Cadmium	2.5	60	7.5	2.6
Calcium	10000	--	--	73000
Chromium	30	6800	--	169
Copper	50	10000	1720	1160
Iron	2000	--	--	114000
Lead	63	3900	450	343
Mercury	0.18	5.7	0.73	0.6
Nickel	30	10000	130	166
Zinc	109	10000	2480	866

CB-03	CRIT 1	CRIT 2	CRIT 3	11/13
VOCs:				
Toluene	0.7	1000	0.7	1.6
SVOCs:				
4-Methylphenol (p-cresol)	0.33	1000	0.33	0.45
Benzo(a)anthracene	1	11	1	1.5
Benzo(a)pyrene	1	1.1	22	1.5
Benzo(b)fluoranthene	1	11	1.7	2.4
Benzo(k)fluoranthene	0.8	110	1.7	0.7
Chrysene	1	110	1	1.9
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	1.1
Metals:				
Calcium	10000	--	--	11600
Chromium	30	6800	--	93000
Cobalt	20	--	--	52.9
Iron	2000	--	--	31.1
Lead	63	3900	450	26600
Nickel	30	10000	130	83.4
Zinc	109	10000	2480	17.4

CB-01	CRIT 1	CRIT 2	CRIT 3	11/13
VOCs:				
Toluene	0.7	1000	0.7	6.9
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.94
Benzo(a)anthracene	1	11	1	15
Benzo(a)pyrene	1	1.1	22	12
Benzo(b)fluoranthene	1	11	1.7	19
Benzo(k)fluoranthene	0.8	110	1.7	6.4
Chrysene	1	110	1	16
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	7.7
Phenol	0.33	1000	0.33	1.8
PCBs:				
Total PCBs	0.1	25	3.2	2.3
Metals:				
Calcium	10000	--	--	105000
Chromium	30	6800	--	43.4
Copper	50	10000	1720	71.9
Iron	2000	--	--	38500
Lead	63	3900	450	80.5
Nickel	30	10000	130	76.2
Zinc	109	10000	2480	578

CB-07	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	1.5
Benzo(a)pyrene	1	1.1	22	1.2
Benzo(b)fluoranthene	1	11	1.7	2.3
Benzo(k)fluoranthene	0.8	110	1.7	0.8
Dibenz(a,h)anthracene	0.33	1.1	1000	0.34
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	1.2
PCBs:				
Total PCBs	0.1	25	3.2	6.5
Metals:				
Arsenic	13	16	16	13.2
Calcium	10000	--	--	79000
Chromium	30	6800	--	197
Copper	50	10000	1720	197
Iron	2000	--	--	31000
Lead	63	3900	450	115
Nickel	30	10000	130	151
Zinc	109	10000	2480	482

CB-08	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	2
Benzo(a)pyrene	1	1.1	22	1.7
Benzo(b)fluoranthene	1	11	1.7	2.5
Benzo(k)fluoranthene	0.8	110	1.7	1.2
Chrysene	1	110	1	2.3
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	1.3
PCBs:				
Total PCBs	0.1	25	3.2	1.4
Metals:				
Calcium	10000	--	--	178000
Chromium	30	6800	--	52.6
Copper	50	10000	1720	131
Iron	2000	--	--	26600
Lead	63	3900	450	162
Nickel	30	10000	130	49.4
Zinc	109	10000	2480	472

CB-39	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	4
Benzo(a)pyrene	1	1.1	22	3.1
Benzo(b)fluoranthene	1	11	1.7	5
Benzo(k)fluoranthene	0.8	110	1.7	1.7
Chrysene	1	110	1	5.3
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	2.5
PCBs:				
Total PCBs	0.1	25	3.2	5.8
Metals:				
Arsenic	13	16	16	15.6
Calcium	10000	--	--	90400
Chromium	30	6800	--	227
Copper	50	10000	1720	413
Iron	2000	--	--	34000
Nickel	30	10000	130	164
Zinc	109	10000	2480	184

CB-11	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	5.6
Benzo(a)pyrene	1	1.1	22	5
Benzo(b)fluoranthene	1	11	1.7	7.5
Benzo(k)fluoranthene	0.8	110	1.7	3.3
Chrysene	1	110	1	6.5
Dibenz(a,h)anthracene	0.33	1.1	1000	0.93
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	5.3
PCBs:				
Total PCBs	0.1	25	3.2	5.7
Metals:				
Calcium	10000	--	--	124000
Chromium	30	6800	--	181
Copper	50	10000	1720	288
Iron	2000	--	--	64100
Lead	63	3900	450	65.6
Nickel	30	10000	130	184
Zinc	109	10000	2480	488

CB-13	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	1.1
Benzo(a)anthracene	1	11	1	18
Benzo(a)pyrene	1	1.1	22	17
Benzo(b)fluoranthene	1	11	1.7	25
Benzo(k)fluoranthene	0.8	110	1.7	9.6
Chrysene	1	110	1	18
Dibenz(a,h)anthracene	0.33	1.1	1000	2.6
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	9.9
PCBs:				
Total PCBs	0.1	25	3.2	2.3
Metals:				
Calcium	10000	--	--	125000
Chromium	30	6800	--	116
Copper	50	10000	1720	1040
Iron	2000	--	--	71000
Lead	63	3900	450	104
Nickel	30	10000	130	101
Zinc	109	10000	2480	591

CB-17	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.58
Benzo(a)anthracene	1	11	1	8
Benzo(a)pyrene	1	1.1	22	6.7
Benzo(b)fluoranthene	1	11	1.7	9.6
Benzo(k)fluoranthene	0.8	110	1.7	3.8
Chrysene	1	110	1	8.2
Dibenz(a,h)anthracene	0.33	1.1	1000	0.89
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	4.2
PCBs:				
Total PCBs	0.1	25	3.2	1.87
Metals:				
Cadmium	2.5	60	7.5	2.6
Calcium	10000	--	--	172000
Chromium	30	6800	--	56.1
Copper	50	10000	1720	58.5
Iron	2000	--	--	19700
Nickel	30	10000	130	48.6
Zinc	109	10000	2480	275

CB-10	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	3.4
Benzo(a)pyrene	1	1.1	22	2.3
Benzo(b)fluoranthene	1	11	1.7	3.3
Benzo(k)fluoranthene	0.8	110	1.7	2.1
Chrysene	1	110	1	3
PCBs:				
Total PCBs	0.1	25	3.2	4.5
Metals:				
Antimony	12	--	--	12.6
Calcium	10000	--	--	65900
Chromium	30	6800	--	85.9
Copper	50	10000	1720	117
Iron	2000	--	--	30000
Lead	63	3900	450	227
Nickel	30	10000	130	73.3
Zinc	109	10000	2480	599

CB-15	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.98
Benzo(a)anthracene	1	11	1	11
Benzo(a)pyrene	1	1.1	22	9.5
Benzo(b)fluoranthene	1	11	1.7	14
bis(2-Ethylhexyl)phthalate	50	--	435	91
Chrysene	1	110	1	10
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	8.7
Metals:				
Antimony	12	--	--	28.3
Calcium	10000	--	--	113000
Chromium	30	6800	--	251
Copper	50	10000	1720	1250
Iron	2000	--	--	46000
Lead	63	3900	450	1230
Nickel	30	10000	130	57.9
Zinc	109	10000	2480	575

CB-12	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	4.3
Benzo(a)pyrene	1	1.1	22	4
Benzo(b)fluoranthene	1	11	1.7	5.1
Benzo(k)fluoranthene	0.8	110	1.7	2.7
Chrysene	1	110	1	5.6
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	3.7
PCBs:				
Total PCBs	0.1	25	3.2	1.9
Metals:				
Calcium	10000	--	--	82300
Chromium	30	6800	--	144
Copper	50	10000	1720	259
Iron	2000	--	--	51000
Lead	63	3900	450	261
Nickel	30	10000	130	117
Zinc	109	10000	2480	574

ADC-06-MS-ST-B	CRIT 1	CRIT 2	CRIT 3	11/13
Metals:				
Chromium	30	6800	--	294
Cobalt	20	--	--	12.5
Iron	2000	--	--	125000
Nickel	30	10000	130	566
Zinc	109	10000	2480	1130

ADC-06-PIP4-01	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	2
Metals:				
Chromium	30	6800	--	575
Cobalt	20	--	--	25.4
Copper	50	10000	1720	1230
Iron	2000	--	--	159000
Lead	63	3900	450	185
Nickel	30	10000	130	977
Zinc	109	10000	2480	698

ADC-06-AST-A	CRIT 1	CRIT 2	CRIT 3	11/13
Metals:				
Chromium	30	6800	--	399
Cobalt	20	--	--	32.5
Copper	50	10000	1720	1660
Iron	2000	--	--	164000
Nickel	30	10000	130	1330
Zinc	109	10000	2480	1440

CB-14	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.48
Benzo(a)anthracene	1	11	1	6.4
Benzo(a)pyrene	1	1.1	22	6.4
Benzo(b)fluoranthene	1	11	1.7	10
Benzo(k)fluoranthene	0.8	110	1.7	3.4
Chrysene	1	110	1	8.8
Dibenz(a,h)anthracene	0.33	1.1	1000	1.3
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	6.4
PCBs:				
Total PCBs	0.1	25	3.2	1.46
Metals:				
Calcium	10000	--	--	79000
Chromium	30	6800	--	156
Copper	50	10000	1720	258
Iron	2000	--	--	109000
Lead	63	3900	450	159
Nickel	30	10000	130	174
Zinc	109	10000	2480	728

CB-16	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.5
Benzo(a)anthracene	1	11	1	7.1
Benzo(a)pyrene	1	1.1	22	6.1
Benzo(b)fluoranthene	1	11	1.7	9.4
Benzo(k)fluoranthene	0.8	110	1.7	4.2
bis(2-Ethylhexyl)phthalate	50	--	435	82
Chrysene	1	110	1	9.2
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	5.4
PCBs:				
Total PCBs	0.1	25	3.2	32
Metals:				
Antimony	12	--	--	12.6
Calcium	10000	--	--	64000
Chromium	30	6800	--	208
Copper	50	10000	1720	188
Iron	2000	--	--	23900
Lead	63	3900	450	203
Nickel	30	10000	130	46.2
Zinc	109	10000	2480	1070

CB-20	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	6.3
Benzo(a)pyrene	1	1.1	22	5.3
Benzo(b)fluoranthene	1	11	1.7	7.2
Benzo(k)fluoranthene	0.8	110	1.7	4.1
Chrysene	1	110	1	6.7
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	5.5
PCBs:				
Total PCBs	0.1	25	3.2	81
Metals:				
Cadmium	2.5	60	7.5	3.2
Calcium	10000	--	--	266000
Chromium	30	6800	--	96.2
Copper	50	10000	1720	1130
Iron	2000	--	--	29100
Nickel	30	10000	130	33
Zinc	109	10000	2480	583

CB-23	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	6.2
Benzo(a)pyrene	1	1.1	22	5.1
Benzo(b)fluoranthene	1	11	1.7	8.3
Benzo(k)fluoranthene	0.8	110	1.7	4
Chrysene	1	110	1	7.9
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	5.6
PCBs:				
Total PCBs	0.1	25	3.2	33
Metals:				
Arsenic	13	16	16	21.7
Cadmium	2.5	60	7.5	5.5
Calcium	10000	--	--	76200
Chromium	30	6800	--	402
Cobalt	20	--	--	24.6
Copper	50	10000	1720	1240
Iron	2000	--	--	264000
Lead	63	3900	450	329
Manganese	1600	10000	2000	1860
Mercury	0.18	5.7	0.73	0.51
Nickel	30	10000	130	156
Zinc	109	10000	2480	1070

CB-25	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	5.7
Benzo(a)pyrene	1	1.1	22	4.4
Benzo(b)fluoranthene	1	11	1.7	6.9
Benzo(k)fluoranthene	0.8	110	1.7	3.8
Chrysene	1	110	1	5.3
PCBs:				
Total PCBs	0.1	25	3.2	11
Metals:				
Cadmium	2.5	60	7.5	14.3
Calcium	10000	--	--	54400
Chromium	30	6800	--	213
Copper	50	10000	1720	410
Iron	2000	--	--	86.2
Lead	63	3900	450	334
Nickel	30	10000	130	75
Zinc	109	10000	2480	1060

CB-26	CRIT 1	CRIT 2	CRIT 3	11/13
PCBs:				
Total PCBs	0.1	25	3.2	0.59
Metals:				
Calcium	10000	--	--	165000
Chromium	30	6800	--	96.2
Copper	50	10000	1720	84.8
Iron	2000	--	--	26700
Nickel	30	10000	130	75
Zinc	109	10000	2480	116

MH-055	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	1.7
Benzo(a)anthracene	1	11	1	17
Benzo(a)pyrene	1	1.1	22	14
Benzo(b)fluoranthene	1	11	1.7	20
Benzo(k)fluoranthene	0.8	110	1.7	8.8
Chrysene	1	110	1	18
Dibenz(a,h)anthracene	0.33	1.1	1000	1.5
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	13
PCBs:				
Total PCBs	0.1	25	3.2	24
Metals:				
Calcium	10000	--	--	35600
Chromium	30	6800	--	66.7
Copper	50	10000	1720	99
Iron	2000	--	--	29200
Lead	63	3900	450	84
Nickel	30	10000	130	40.6
Zinc	109	10000	2480	456

CB-22	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	2.5
Benzo(a)anthracene	1	11	1	65
Benzo(a)pyrene	1	1.1	22	58
Benzo(b)fluoranthene	1	11	1.7	75
Benzo(k)fluoranthene	0.8	110	1.7	36
Chrysene	1	110	1	68
Dibenz(a,h)anthracene	0.33	1.1	1000	5.8
Fluoranthene	100	1000	1000	150
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	49
Naphthalene	12	1000	12	36
Phenanthrene	100	1000	1000	150
Pyrene	100	1000	1000	150
PCBs:				
Total PCBs	0.1	25	3.2	21
Metals:				
Calcium	10000	--	--	13200
Chromium	30	6800	--	66.5
Copper	50	10000	1720	89.9
Iron	2000	--	--	32200
Lead	63	3900	450	166
Manganese	1600	10000	2000	1740
Nickel	30	10000	130	69.3
Zinc	109	10000	2480	245

CB-27	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.55
Benzo(a)anthracene	1	11	1	7.7
Benzo(a)pyrene	1	1.1	22	6.4
Benzo(b)fluoranthene	1	11	1.7	9.2
Benzo(k)fluoranthene	0.8	110	1.7	4.3
Chrysene	1	110	1	8.5
Dibenz(a,h)anthracene	0.33	1.1	1000	1.1
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	5.4
PCBs:				
Total PCBs	0.1	25	3.2	4.13
Metals:				
Calcium	10000	--	--	159000
Chromium	30	6800	--	42.4
Copper	50	10000	1720	149
Iron	2000	--	--	24500
Lead	63	3900	450	66.4
Nickel	30	10000	130	54.5
Zinc	109	10000	2480	228

MH-053-3	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.45
Benzo(a)anthracene	1	11	1	19
Benzo(a)pyrene	1	1.1	22	17
Benzo(b)fluoranthene	1	11	1.7	24
Benzo(k)fluoranthene	0.8	110	1.7	11
Chrysene	1	110	1	19
Dibenz(a,h)anthracene	0.33	1.1	1000	2.7
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	16
PCBs:				
Total PCBs	0.1	25	3.2	267.9
Metals:				
Arsenic	13	16	16	22
Cadmium	2.5	60	7.5	4.5
Calcium	10000	--	--	70700
Chromium	30	6800	--	158
Copper	50	10000	1720	367
Iron	2000	--	--	170000
Lead	63	3900	450	839
Mercury	0.18	5.7	0.73	0.2
Nickel	30	10000	130	154
Zinc	109	10000	2480	638

CB-21	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	2
Benzo(a)anthracene	1	11	1	37
Benzo(a)pyrene	1	1.1	22	37
Benzo(b)fluoranthene	1	11	1.7	39
Benzo(k)fluoranthene	0.8	110	1.7	9.7
Chrysene	1	110	1	21
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	12
PCBs:				
Total PCBs	0.1	25	3.2	2.8
Metals:				
Antimony	12	--	--	36.5
Calcium	10000	--	--	186000
Chromium	30	6800	--	43.4
Copper	50	10000	1720	3160
Iron	2000	--	--	54600
Lead	63	3900	450	145
Nickel	30	10000	130	275
Zinc	109	10000	2480	6560

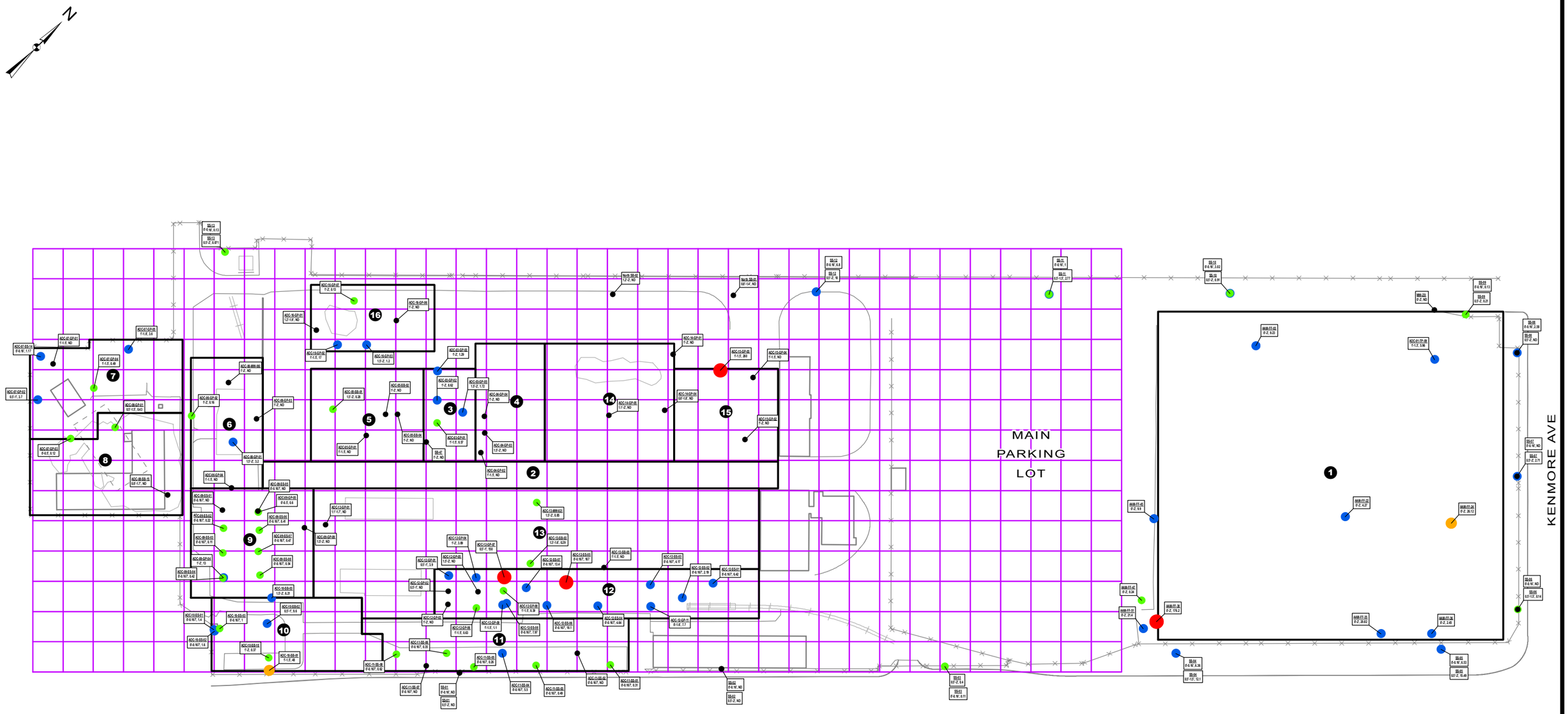
CB-28	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	0.57
Benzo(a)anthracene	1	11	1	7.4
Benzo(a)pyrene	1	1.1	22	6.2
Benzo(b)fluoranthene	1	11	1.7	9.7
Benzo(k)fluoranthene	0.8	110	1.7	3.3
Chrysene	1	110	1	8.6
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	5.3
PCBs:				
Total PCBs	0.1	25	3.2	5.5
Metals:				
Calcium	10000	--	--	125000
Chromium	30	6800	--	66.2
Copper	50	10000	1720	134
Iron	2000	--	--	30000
Lead	63	3900	450	90
Nickel	30	10000	130	111
Zinc	109	10000	2480	223

MW-117	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	0.69
PCBs:				
Total PCBs	0.1	25	3.2	39
Metals:				
Aluminum	10000	--	--	19300
Arsenic	13	16	16	16
Barium	350	10000	820	542
Cadmium	2.5	60	7.5	3.7
Calcium	10000	--	--	28600
Chromium	30	6800	--	425
Cobalt	20	--	--	28.6
Copper	50	10000	1720	1030
Iron	2000	--	--	44000
Lead	63	3900	450	1040
Manganese	1600	10000	2000	1740
Mercury	0.18	5.7	0.73	0.4
Nickel	30	10000	130	371
Silver	2	680	8.3	2.2
Vanadium	39	--	--	49.2
Zinc	109	10000	2480	762

CB-30	CRIT 1	CRIT 2	CRIT 3	11/13
VOCs:				
Acetone	0.05	1000	0.05	0.084
SVOCs:				
Benzo(b)fluoranthene	1	11	1.7	6.9
Benzo(k)fluoranthene	0.8	110	1.7	2.4
Chrysene	1	110	1	4.9
PCBs:				
Total PCBs	0.1	25	3.2	11
Metals:				
Cadmium	2.5	60	7.5	2.6
Calcium	10000	--	--	79000
Chromium	30	6800	--	158
Copper	50	10000	1720	2840
Iron	2000	--	--	46200
Lead	63	3900	450	190
Nickel	30	10000	130	94
Zinc	109	10000	2480	1280

CB-32	CRIT 1	CRIT 2	CRIT 3	11/13
VOCs:				
1,1-Dichloroethene	0.33	1000	0.33	1.2
SVOCs:				
2-Methylnaphthalene	0.41	--	36.4	1.6
Benzo(a)anthracene	1	11	1	7.2
Benzo(a)pyrene	1	1.1	22	12
Benzo(b)fluoranthene	1	11	1.7	20
Benzo(k)fluoranthene	0.8	110	1.7	7.5
bis(2-Ethylhexyl)phthalate	50	--	435	1.8
Chrysene	1	110	1	9.4
Dibenz(a,h)anthracene	0.33	1.1	1000	5.6
Indeno(1,2,3-cd)pyrene	0.5	11	8.2	11
PCBs:				
Total PCBs	0.1	25	3.2	49.7
Metals:				
Calcium	10000	--	--	11200
Chromium	30	6800	--	49.2
Copper	50	10000	1720	74.2
Iron	2000	--	--	20400
Lead	63	3900	450	100
Mercury	0.18	5.7	0.73	0.5
Nickel	30	10000	130	41.3
Zinc	109	10000	2480	395

CB-31	CRIT 1	CRIT 2	CRIT 3	11/13
SVOCs:				
Benzo(a)anthracene	1	11	1	9.6
Benzo(a)pyrene	1	1.1	22	7.7
Benzo(b)fluoranthene	1	11	1.7	10
Benzo(k)fluoranthene	0.8	110	1.7	4.2
Chrysene	1



Legend

Total PCB Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100
- 50' Grid
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL PCBS - 0'-2' BGS

AECOM

FIGURE 4

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL PCBS_Soils_0-2ft.mxd 9/30/2020

N

AOC-16-MW-05I
2'-3', ND

SB-51
1'-3.75', 14

SB-54
1'-3', 290

AOC-16-GP-05
2'-3', ND

North SB-03
1.8'-2.8', ND

AOC-14-GP-03
2'-2.9', ND

AOC-14-GP-02
3'-4', ND

AOC-06-MW-06I
2'-3', ND

SB-53
1'-4', 40

AOC-03-GP-06
2'-2.5', 15

AOC-03-GP-07
3'-3.5', 0.45

SB-56
2'-4', ND

AOC-08-GP-01
3'-3.5', 0.49

AOC-08-SB-16
2.8'-4', ND

AOC-05-GP-02
3'-4', ND

AOC-14-GP-06
3'-4', ND

AOC-14-MW-21I
1.5'-3', ND

AOC-05-MW-04I
2'-3', ND

AOC-06-GP-01
3'-3.5', ND

AOC-03-GP-04
1.8'-2.3', 0.18

AOC-14-GP-08
3'-4', ND

AOC-15-GP-06
2'-2.5', ND

SB-39
1'-3.5', 6.8

AOC-04-GP-01
2'-3', ND

AOC-02-MW-01I
1.3'-2.3', 0.076

AOC-08-GP-03
3'-3.5', 2.99

AOC-08-SB-15
2'-4', 0.19

SB-20
1'-4', 0.65

AOC-14-GP-07
2.2'-3.2', ND

AOC-15-GP-01
3'-3.5', ND

AOC-09-GP-01
2'-3', 0.82

AOC-09-GP-05
2.5'-3', ND

AOC-02-GP-01
2'-3', 0.15

AOC-02-MW-03I
3'-4', 3.64

AOC-09-GP-02
2'-2.5', 3.63

AOC-09-GP-06
2'-3', 2.36

AOC-13-SB-02
1.7'-2.2', ND

AOC-08-SB-14
3'-3.6', 0.27

AOC-08-GP-02
2.5'-3', 2.3

AOC-09-GP-03
1.5'-2.5', 3.76

AOC-09-GP-07
2.6'-3.6', ND

AOC-13-SB-04
2.3'-2.9', 0.72

AOC-13-SB-06
2'-3', ND

AOC-13-MW-19I
2'-3', 54

AOC-09-GP-03
2.5'-3.5', 10.94

AOC-09-GP-08
2'-2.5', 6.09

AOC-12-MW-09I
2'-3', ND

AOC-10-SB-05
2'-3', 2.5

AOC-12-GP-10
1.8'-2.4', ND

AOC-09-GP-04
3'-4', 3.42

AOC-10-SB-04
3'-4', 3.1

AOC-10-SB-06
2'-4', 0.82

AOC-10-SB-08
2'-3', 0.23

AOC-10-SB-13
2'-4', 0.28

AOC-10-SB-09
2'-3', ND

AOC-10-MW-08I
3'-4', 0.21

AOC-10-SB-02
2.5'-3', ND

AOC-11-GP-03
2'-3.6', 3.9

AOC-11-GP-02
2.4'-3', 0.77

AOC-11-GP-01
2.1'-2.8', 1.98

AOC-10-SB-12
2'-3', ND

AOC-10-SB-01
2'-2.5', ND

AOC-10-GP-02
2.5'-3.1', ND

AOC-10-GP-01
2.4'-3.4', ND

MAIN
PARKING
LOT

MW-22I
0.5'-2.5', ND

SB-66
2'-4', 0.41

AOC-01-MW-11I
2'-4', ND

SB-75
2'-4', 2.5

AAM-FF-07
2'-4', 4.47

AAM-FF-10
2'-4', ND

AOC-01-TP-05
3'-4', ND

SB-76
2'-4', 3.69

AOC-01-TP-10
3'-4', 4.7

AOC-01-TP-X02
2.5'-3', 3.1

SB-74
2'-4', 20

AAM-FF-14
2'-4', 60.24

AOC-01-TP-08
3'-3.5', 8.63

AAM-FF-18
2'-4', 72.32

AOC-01-TP-X09
2'-3', 3.86

AOC-01-TP-X03
3'-3.5', 0.055

AOC-01-MW-13I
3'-4', 1.8

AOC-01-TP-11
3'-4', 33.4

SB-78
2'-4', 0.97

AOC-01-TP-X08
3'-3.5', 1.4

SB-63
2'-4', 0.59

AOC-01-TP-14
3'-4', 14

AOC-01-MW-10I
2'-3', 1.73

AOC-01-TP-15
3'-4', 4.4

AOC-01-TP-02
3'-4', 1.55

AAM-FF-50
2'-4', 30.7

AOC-01-MW-12I
3'-4', 37

AOC-01-TP-23
2.4'-3.4', 9.7

SB-80
2'-4', 69

AAM-FF-40
2'-4', 2.34

KENMORE AVE

Legend

Total PCB Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100
- 50' Grid
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL PCBS - 2'-4' BGS

AECOM

FIGURE 5

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL PCBS_Soils_2-4ft.mxd 9/30/2020

N

AOC-16-MW-05I
5'-6', ND

AOC-07-GP-01
5'-6', ND

AOC-07-GP-04
5.5'-6', ND

AOC-08-N-TT-11
4'-5', 1.42

AOC-08-S-TT-18
4'-4.5', 17

AOC-08-N-TT-47
4'-5', ND

AOC-08-S-TT-60
4'-5', 1.02

AOC-08-N-TT-80
4'-5', 0.22

AOC-08-S-TT-86
4'-5', 2.11

AOC-08-GP-02
4'-5', 54

AOC-09-GP-01
5'-5.5', 0.4

AOC-09-GP-06
4'-5', 2.58

AOC-09-GP-08
4'-4.5', ND

AOC-09-GP-07
4'-4.5', ND

AOC-10-SB-08
5'-6', 0.075

AOC-10-MW-08I
5'-6', ND

AOC-10-SB-15
4'-5', 11

AOC-10-SB-14
4'-6', 1

AOC-05-GP-03
4'-4.5', ND

AOC-05-MW-04I
5'-6', ND

AOC-05-GP-04
4'-5', ND

AOC-03-GP-04
5'-5.6', ND

AOC-03-GP-07
5'-6', ND

AOC-04-GP-04
4'-5', ND

AOC-04-GP-02
4'-5', ND

AOC-02-GP-01
4'-5', ND

AOC-02-MW-03I
5'-6', ND

SB-33
4'-6', ND

AOC-13-SB-01
4'-4.5', 0.5

AOC-13-SB-01
5'-6', ND

SB-41
3.5'-6', ND

AOC-12-MW-09I
4'-5', ND

AOC-12-GP-12
4'-5', ND

MW-C
3'-5', ND

SB-13
4'-6', ND

AOC-13-GP-03
4'-5', ND

AOC-15-GP-04
4'-5', ND

AOC-15-GP-01
4'-5', ND

SB-09
4'-6', ND

SB-04
4'-6', ND

AOC-13-SB-07
5'-5.5', ND

MAIN
PARKING
LOT

AAM-FF-42
4'-6', ND

AAM-FF-17
4'-6', 6.77

AOC-01-TP-X01
4'-4.5', 18.3

AAM-FF-20
4'-6', 0.05

AOC-01-TP-X07
4'-5', 5.8

SB-72
4'-6', 0.79

AOC-01-TP-20
4'-5', 7.31

SB-69
4'-6', 3.7

AOC-01-TP-X04
4.8'-5', ND

AOC-01-TP-X06
4'-5', 2.35

AOC-01-TP-X05
4'-5', 7.9

SB-70
4'-6', 1.34

KENMORE AVE

Legend

Total PCB Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100
- 50' Grid
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL PCBS - 4'-6' BGS

AECOM

FIGURE 6

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL PCBS_Soils_4-6ft.mxd 9/30/2020

RR-210A
4'-8', 46

MW-E
5'-7', ND

AOC-16-GP-06
6'-7', ND

AOC-16-GP-02
6'-7', 0.057

AOC-16-GP-05
6'-7', ND

MW-F
5'-7', ND

AOC-03-GP-03
7'-8', ND

AOC-05-SB-01
6'-7', ND

AOC-16-GP-03
6'-7', ND

AOC-06-GP-02
7'-8', ND

MW-D
5'-7', ND

AOC-06-GP-03
7'-8', ND

AOC-08-SB-16
6'-8', ND

AOC-07-GP-03
6'-6.5', ND

SB-02
6'-8', ND

AOC-14-GP-07
7'-8', 0.23

AOC-05-SB-03
7'-8', ND

AOC-05-SB-02
6'-7', ND

SB-57
6'-8', ND

AOC-05-GP-02
7'-8', ND

MW-A
5'-7', ND

MAIN
PARKING
LOT

AOC-06-GP-04
6'-7', ND

AOC-09-GP-05
6'-7', ND

AOC-13-MW-02I
7'-8', ND

RR-066A
4'-8', 1.8

AOC-08-GP-03
7'-8', 0.47

AOC-09-GP-09
6'-7', ND

AOC-09-GP-02
7'-8', ND

AOC-13-GP-02
6'-7.5', 1.2

AOC-12-GP-02
6'-7', ND

AOC-12-GP-04
6'-6.5', ND

SB-30
4'-8', 0.59

SB-21
6'-8', ND

SB-10
6'-8', ND

AOC-13-GP-04
6.4'-7.4', ND

AOC-10-SB-03
7'-8', ND

AOC-12-GP-08
7'-8', ND

AOC-13-MW-20I
6'-6.4', 0.12

AOC-12-GP-05
7'-8', ND

AOC-12-GP-09
7'-8', ND

AOC-12-GP-06
7'-8', ND

AOC-01-MW-11I
6'-8', 0.89

SB-61
6'-8', 0.053

KENMORE AVE

RR-034A
4'-8', 9

RR-031A
4'-8', 3.2

RR-222A
4'-8', 24

RR-016B
4'-8', ND

RR-024A
4'-8', 180

RR-008A
4'-8', 0.178

AOC-11-GP-03
6'-7', 1.9

RR-267A
4'-8', 0.37

RR-259A
4'-8', 1.03

RR-251A
4'-8', 0.4

RR-233A
4'-8', 0.037

Legend

Total PCB Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100
- 50' Grid
- Area of Concern

NOTE: RR Locations were collected by Conestoga-Rovers & Associates as part of the Historical and Active Railroad Drainage Line Subsurface Investigation, November 2000. Offsite locations are based on historical railroad locations that are no longer extant.

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL PCBS - 6'-8' BGS

AECOM

FIGURE 7

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL PCBS_Soils_6-8ft.mxd 11/24/2020

N

AOC-16-GP-04
8'-9', 1.4

SB-36
8'-10', ND

AOC-07-GP-02
8'-8.5', 0.26

AOC-08-MW-07S
8'-10', 1.5

AOC-03-GP-02
9'-10', ND

AOC-03-GP-05
8'-9', ND

AOC-03-GP-01
9'-10', ND

SB-26
8'-10', 0.18

SB-12
8'-10', 0.076

SB-06
8'-10', 0.21

SB-08
8'-10', ND

SB-03
8'-10', 0.28

AOC-14-GP-05
7.8'-8.2', 0.16

AOC-14-MW-21I
8.2'-8.4', 0.29

AOC-14-MW-21I
9'-10', 0.56

AOC-13-SB-08
8'-9', ND

SB-29
8'-10', ND

AOC-13-SB-05
8.5'-9.5', ND

AOC-13-SB-07
8'-9', ND

AOC-10-SB-04
8'-10', ND

AOC-11-GP-04
8'-9', ND

AOC-10-SB-14
8'-10', 0.18

MAIN
PARKING
LOT

SB-65
8'-10', ND

KENMORE AVE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Legend

Total PCB Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100

50' Grid

Area of Concern

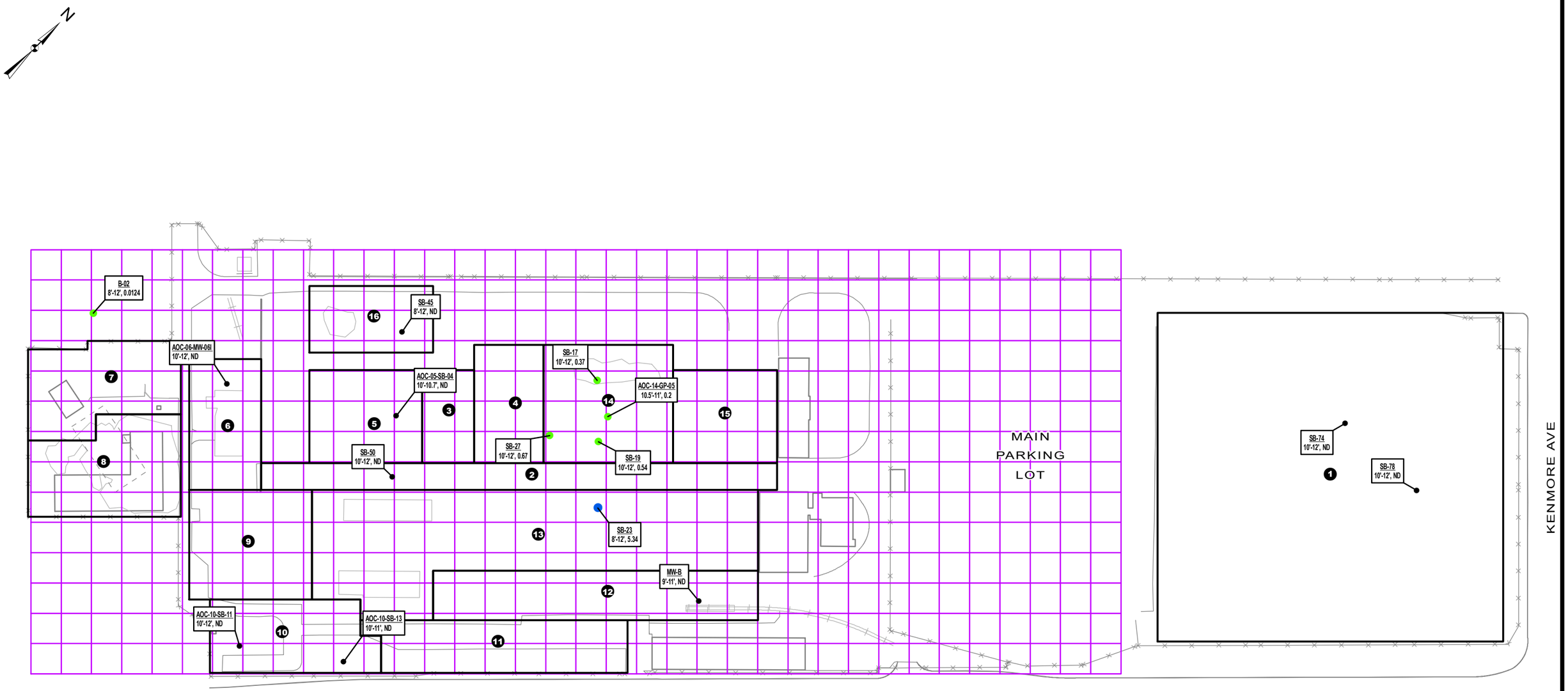
160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL PCBS - 8'-10' BGS

AECOM

FIGURE 8

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL PCBS_Soils_8-10ft.mxd 9/30/2020



Legend

Total PCB Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100
- 50' Grid
- Area of Concern

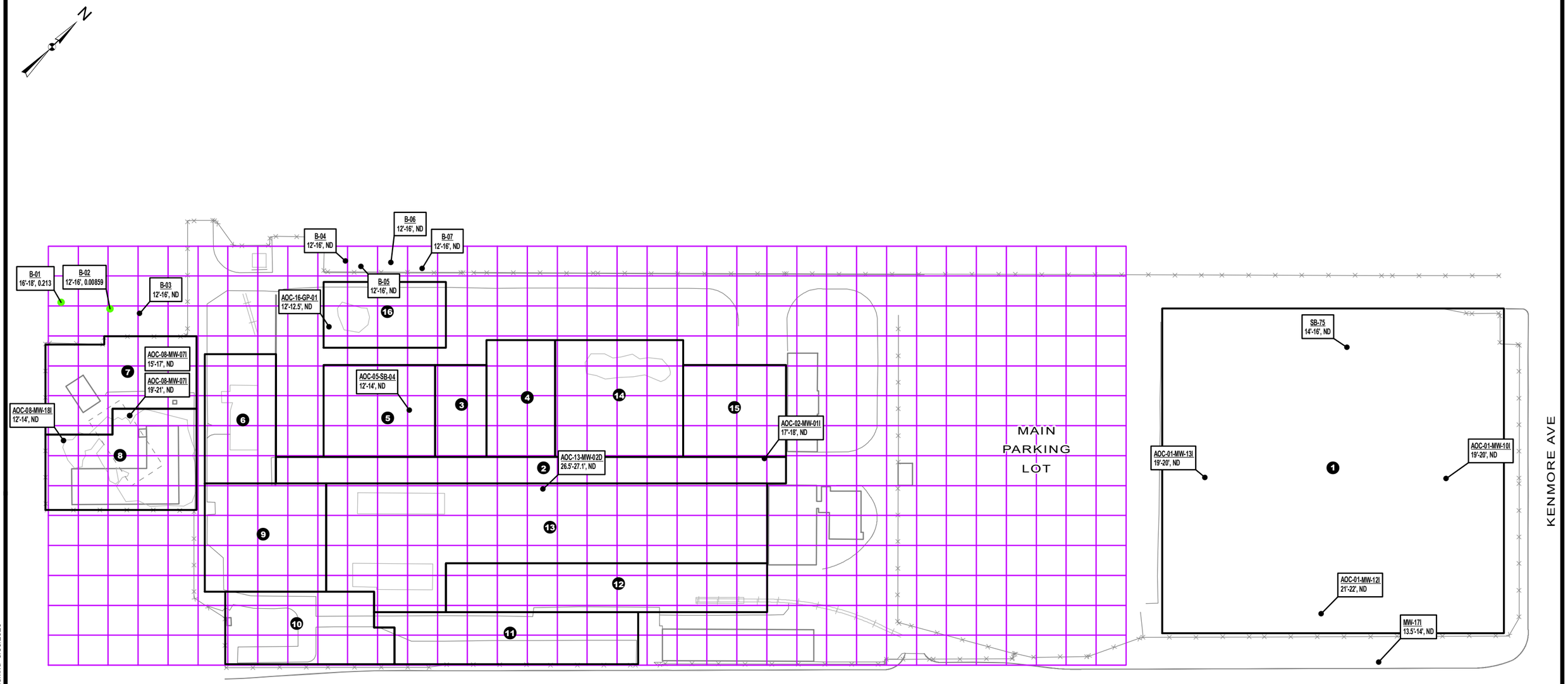
160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL PCBS - 10'-12' BGS

AECOM

FIGURE 9

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL PCBS_Soils_10-12ft.mxd 9/30/2020



Legend

Total PCB Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100
- 50' Grid
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL PCBS - 12'-28' BGS

AECOM

FIGURE 10

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL PCBS_Soils_12-28ft.mxd 9/30/2020

N

SS-13
0'-0.16', ND

SS-13
0.5'-2', ND

AOC-16-GP-07
1'-2', 0.22

AOC-16-GP-06
1'-2', 0.53

AOC-16-GP-01
1.2'-1.9', ND

AOC-16-GP-03
1.5'-2', ND

North SB-02
1.2'-2', 0.48

North SB-01
0.8'-1.4', ND

SS-12
0'-0.16', 73.9

SS-12
0.5'-2', 0.113

SS-11
0'-0.16', 29.9

SS-11
0.5'-1.5', 8.56

SS-10
0'-0.16', 96

SS-10
0.5'-2', 1.34

MW-23I
0'-2', 75.87

SS-09
0'-0.16', 7.12

SS-09
0.5'-2', 22.4

SS-08
0'-0.16', 7.58

SS-08
0.5'-2', 0.213

AOC-07-SS-14
0'-0.16', 8.65

AOC-07-GP-01
1'-1.5', ND

AOC-07-GP-05
1'-1.8', 49.14

AOC-06-MW-06I
1'-2', 0.32

AOC-16-GP-02
1'-1.5', 6.71

AOC-05-SB-01
1.5'-2', 0.045

AOC-05-SB-04
1'-2', ND

AOC-03-GP-03
1'-2', 1.801

AOC-14-GP-01
1'-2', ND

AOC-15-GP-03
1'-1.5', ND

AOC-15-GP-04
1'-1.5', ND

AOC-07-GP-04
1'-1.5', 5.272

AOC-06-GP-03
1'-2', 0.068

AOC-05-SB-02
1'-2', ND

AOC-03-GP-02
1'-2', 0.24

AOC-03-GP-05
1.5'-2', 2.575

AOC-04-GP-04
1'-2', 0.165

AOC-14-GP-04
0.8'-1.8', 0.242

AOC-01-TP-09
1'-1.3', 4.75

AOC-08-GP-01
0.5'-1.5', 2.698

AOC-07-GP-02
0.5'-1', 0.164

AOC-06-GP-02
1'-2', ND

AOC-06-GP-01
1.5'-2', 1.557

SB-47
1'-2', 0.0226

AOC-04-GP-03
1.5'-2', ND

AOC-14-GP-05
1.1'-2', ND

AOC-15-GP-02
1'-2', 0.198

MAIN
PARKING
LOT

AOC-07-GP-03
0'-0.5', 18.668

AOC-08-SB-15
0.8'-1.7', 0.8

AOC-06-GP-04
1'-1.5', 1.59

AOC-09-SS-01
0'-0.167', 5.245

AOC-09-GP-05
0'-0.5', 2255.8

AOC-05-GP-01
1'-1.5', 0.0204

AOC-03-GP-01
1'-1.5', 0.2749

AOC-13-MW-02I
1.5'-2', 0.962

AOC-04-GP-02
1'-1.5', ND

AOC-12-GP-07
0.5'-1', 421.7

AOC-09-SS-05
0'-0.5', 109.4

AOC-09-GP-09
1.5'-2', ND

AOC-12-GP-04
1'-2', 0.565

AOC-12-GP-05
1.5'-2', 0.0595

AOC-13-GP-01
1.1'-1.7', ND

AOC-09-SS-02
0'-0.167', 2.597

AOC-09-SS-06
0'-0.167', 7.957

AOC-13-SB-03
1.3'-1.6', 0.071

AOC-13-SB-05
1'-1.5', 0.01

AOC-09-SS-03
0'-0.167', 7.196

AOC-12-GP-01
0.5'-1', 0.758

AOC-12-SS-07
0'-0.167', 121.18

AOC-12-SS-03
0'-0.167', 111.54

AOC-12-SS-01
0'-0.167', 192.63

AOC-09-GP-04
1'-2', 2.1947

AOC-09-SS-07
0'-0.167', 10.582

AOC-12-GP-02
0.5'-1', 0.4758

AOC-09-SS-04
0'-0.167', 4.34

AOC-09-SS-08
0'-0.167', 9.769

AOC-12-GP-03
1'-2', 0.2544

AOC-12-SS-05
0'-0.167', 531.11

AOC-10-SS-03
0'-0.167', 4.042

AOC-10-SB-03
1.5'-2', 0.22

AOC-12-SS-06
0'-0.167', 85.05

AOC-12-SS-02
0'-0.167', 334.994

AOC-10-SS-01
0'-0.167', 8.318

AOC-12-GP-06
1'-1.5', 0.655

AOC-12-GP-08
1'-1.5', 0.124

AOC-12-GP-09
1'-1.5', 0.512

AOC-12-SS-04
0'-0.167', 19.316

AOC-12-GP-11
0'-1.6', 89.16

AOC-10-SB-02
0.5'-1', 11.05

AOC-12-SS-08
0'-0.167', 104.31

AOC-11-SS-02
0'-0.167', 2.255

AOC-10-SS-02
0'-0.167', 7.78

AOC-11-SS-08
0'-0.167', 2.39

AOC-11-SS-04
0'-0.167', 10.431

AOC-11-SS-03
0'-0.167', 2.484

AOC-11-SS-01
0'-0.167', 2.4

SS-02
0'-0.16', 1.73

AOC-10-SB-10
1'-2', 2.244

AOC-10-SB-01
1'-1.5', 2.35

AOC-11-SS-07
0'-0.167', 3.327

SS-01
0'-0.16', 0.91

AOC-11-SS-05
0'-0.167', 4.466

AOC-11-SS-06
0'-0.167', 5.634

SS-01
0.5'-2', 0.11

SS-02
0.5'-2', ND

SS-03
0'-0.16', 3.51

SS-03
0.5'-2', 5.13

SS-04
0'-0.16', 29.4

SS-04
0.5'-1.5', 18.4

SS-05
0'-0.16', 3.4

SS-05
0.5'-2', 9.59

SS-07
0'-0.16', 1.23

SS-07
0.5'-2', 1.47

SS-06
0'-0.16', 2.94

SS-06
0.5'-1.5', 0.36

KENMORE AVE

Legend

Total SVOC Concentration (mg/kg):

- ND
- < 10
- 10 - 100
- 100 - 500
- > 500
- 50' Grid
- Test Pit
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL SVOCS - 0'-2' BGS

AECOM

FIGURE 11

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL SVOCS_Soils_0-2ft.mxd 9/22/2020

N

AOC-16-MW-05I 2'-3', ND
SB-51 1'-3.75', 12.36
SB-54 1'-3', 0.987
SB-53 1'-4', 3.75
AOC-16-GP-05 2'-3', 5.355
AOC-14-GP-03 2'-2.9', ND
North SB-03 1.8'-2.8', ND
AOC-14-GP-02 3'-4', 0.225
AOC-03-GP-07 3'-3.5', ND
AOC-06-MW-06I 2'-3', ND
SB-56 2'-4', 0.0687
AOC-03-GP-06 2'-2.5', 9.29
AOC-14-GP-06 3'-4', 0.024
AOC-14-MW-21I 1.5'-3', 2.879
AOC-08-GP-01 3'-3.5', 16.622
AOC-08-SB-16 2.8'-4', 2.74
AOC-05-MW-04I 2'-3', ND
AOC-05-GP-02 3'-4', ND
AOC-15-GP-06 2'-2.5', 2.82
AOC-06-GP-01 3'-3.5', 0.089
AOC-03-GP-04 1.8'-2.3', 0.2993
AOC-14-GP-08 3'-4', 2.146
AOC-14-GP-07 2.2'-3.2', ND
AOC-15-GP-01 3'-3.5', 0.011
AOC-08-GP-03 3'-3.5', 336.5
AOC-08-SB-15 2'-4', ND
SB-39 1'-3.5', 0.05
AOC-04-GP-01 2'-3', 0.079
AOC-02-MW-01I 1.3'-2.3', 0.05
SB-20 1'-4', 0.0975
AOC-09-GP-01 2'-3', 5.149
AOC-09-GP-05 2.5'-3', 4.576
AOC-09-GP-06 2'-3', 3.035
AOC-02-GP-01 2'-3', 0.159
AOC-02-MW-03I 3'-4', 1.012
AOC-08-SB-14 3'-3.6', 10.29
AOC-08-GP-02 2.5'-3', 3.613
AOC-09-GP-03 1.5'-2.5', 0.453
AOC-09-GP-03 2.5'-3.5', 6.948
AOC-09-GP-07 2.6'-3.6', 4.049
AOC-09-GP-08 2'-2.5', 7.378
AOC-13-MW-19I 2'-3', 20.7
AOC-13-SB-02 1.7'-2.2', 2.15
AOC-13-SB-04 2.3'-2.9', ND
AOC-13-SB-06 2'-3', ND
AOC-09-GP-04 3'-4', 4.16
AOC-10-SB-04 3'-4', 30.85
AOC-10-SB-07 2'-3', ND
AOC-12-MW-09I 2'-3', ND
AOC-12-GP-10 1.8'-2.4', ND
AOC-10-SB-08 2'-3', 12.6
AOC-10-SB-05 2'-3', 0.5636
AOC-10-SB-06 2'-4', 0.1493
AOC-10-SB-09 2'-3', 6.591
AOC-10-MW-08I 3'-4', 23.81
AOC-10-SB-12 2'-3', 1.554
AOC-10-SB-01 2'-2.5', ND
AOC-10-GP-02 2.5'-3.1', 0.065
AOC-10-SB-02 2.5'-3', 0.355
AOC-10-SB-13 2'-4', 9.699
AOC-11-GP-03 2'-3.6', 0.21
AOC-10-GP-01 2.4'-3.4', ND
AOC-11-GP-02 2.4'-3', ND
AOC-11-GP-01 2.1'-2.8', 823.4

MAIN PARKING LOT

MW-22I 0.5'-2.5', ND

SB-66 2'-4', 0.13
AOC-01-MW-11I 2'-4', ND
SB-75 2'-4', 1.33
SB-76 2'-4', 1.624
AOC-01-TP-05 3'-4', 2.258
AOC-01-TP-X09 2'-3', 23.471
AOC-01-TP-X03 3'-3.5', 11.413
AOC-01-TP-X02 2.5'-3', 2.43
SB-74 2'-4', 1.719
AOC-01-TP-10 3'-4', 0.503
AOC-01-TP-08 3'-3.5', 5.134
AOC-01-MW-13I 3'-4', 12.37
AOC-01-TP-11 3'-4', 32.14
SB-78 2'-4', 0.87
AOC-01-TP-14 3'-4', 1.189
SB-63 2'-4', 0.75
AOC-01-TP-X08 3'-3.5', 3.55
AOC-01-MW-10I 2'-3', 1.5166
AOC-01-TP-15 3'-4', 0.951
AOC-01-TP-02 3'-4', 11.493
AOC-01-MW-12I 3'-4', 16.138
AOC-01-TP-23 2.4'-3.4', 16.2842
SB-80 2'-4', 3.55

KENMORE AVE

Legend

Total SVOC Concentration (mg/kg):

- ND
- < 10
- 10 - 100
- 100 - 500
- > 500
- 50' Grid
- Test Pit
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL SVOCS - 2'-4' BGS

AECOM

FIGURE 12

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL SVOCS_Soils_2-4ft.mxd 9/22/2020

N

AOC-16-MW-05I
5'-6', 0.22

AOC-07-GP-01
5'-6', ND

AOC-07-GP-04
5.5'-6', ND

AOC-08-N-TT-11
4'-5', 19.1

AOC-08-N-TT-47
4'-5', 0.45

AOC-08-S-TT-18
4'-4.5', 1.036

AOC-08-N-TT-80
4'-5', 9.291

AOC-08-S-TT-60
4'-5', 83.61

AOC-08-S-TT-86
4'-5', 46.1

AOC-08-GP-02
4'-5', 0.9

AOC-09-GP-01
5'-5.5', 1.26

AOC-09-GP-06
4'-5', 6.92

AOC-09-GP-07
4'-4.5', 0.0086

AOC-09-GP-08
4'-4.5', ND

AOC-10-SB-08
5'-6', 17.17

AOC-10-MW-08I
5'-6', 4.0121

AOC-10-SB-15
4'-5', 67.538

AOC-10-SB-14
4'-6', 8.977

AOC-05-GP-03
4'-4.5', ND

AOC-05-MW-04I
5'-6', 1.1173

AOC-05-GP-04
4'-5', 0.011

AOC-03-GP-07
5'-6', ND

AOC-04-GP-04
4'-5', ND

AOC-03-GP-04
5'-5.6', 1.449

AOC-04-GP-02
4'-5', ND

AOC-02-GP-01
4'-5', ND

AOC-02-MW-03I
5'-6', 1.3

AOC-13-SB-01
4'-4.5', ND

AOC-13-SB-01
5'-6', ND

AOC-12-MW-09I
4'-5', 0.56

MW-C
3'-5', 0.0134

SB-33
4'-6', 0.1419

SB-41
3.5'-6', 0.0217

AOC-12-GP-12
4'-5', ND

AOC-13-GP-03
4'-5', ND

SB-09
4'-6', 0.016

AOC-13-SB-07
5'-5.5', 0.0061

SB-04
4'-6', 0.268

SB-13
4'-6', 0.5056

AOC-15-GP-04
4'-5', ND

AOC-15-GP-01
4'-5', ND

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

MAIN
PARKING
LOT

KENMORE AVE

AOC-01-TP-X01
4'-4.5', 1.291

AOC-01-TP-X07
4'-5', 14.255

SB-69
4'-6', 0.859

AOC-01-TP-X06
4'-5', 97.25

SB-72
4'-6', 1.3

AOC-01-TP-20
4'-5', 24.49

AOC-01-TP-X04
4.8'-5', 0.8269

AOC-01-TP-X05
4'-5', 6.268

SB-70
4'-6', 2.166

Legend

Total SVOC Concentration (mg/kg):

- ND
- < 10
- 10 - 100
- 100 - 500
- > 500

50' Grid

Test Pit

Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL SVOCS - 4'-6' BGS

AECOM

FIGURE 13

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL SVOCS_Soils_4-6ft.mxd 9/24/2020

N

MW-E
5'-7', 0.382

AOC-16-GP-03
6'-7', 0.035

AOC-16-GP-06
6'-7', ND

AOC-16-GP-02
6'-7', ND

AOC-16-GP-05
6'-7', ND

MW-F
5'-7', 0.3815

AOC-03-GP-03
7'-8', ND

AOC-06-GP-02
7'-8', 0.0682

MW-D
5'-7', 0.0338

AOC-08-SB-16
6'-8', ND

AOC-06-GP-03
7'-8', ND

AOC-05-GP-02
7'-8', 0.568

SB-02
6'-8', 0.1889

AOC-07-GP-03
6'-6.5', 0.3858

AOC-05-SB-01
6'-7', 0.0203

AOC-14-GP-07
7'-8', 0.035

AOC-05-SB-03
7'-8', ND

SB-57
6'-8', ND

AOC-05-SB-02
6'-7', ND

MW-A
5'-7', 0.5825

AOC-06-GP-04
6'-7', ND

AOC-08-GP-03
7'-8', 0.7977

AOC-13-MW-02I
7'-8', 0.665

AOC-09-GP-05
6'-7', 4.123

AOC-09-GP-02
7'-8', 0.031

AOC-09-GP-09
6'-7', ND

SB-21
6'-8', 0.2346

SB-10
6'-8', 0.0235

AOC-13-GP-04
6.4'-7.4', ND

AOC-13-GP-02
6'-7.5', ND

AOC-12-GP-04
6'-6.5', ND

AOC-12-GP-08
7'-8', 0.074

SB-30
4'-8', ND

AOC-10-SB-03
7'-8', 0.0088

AOC-12-GP-05
7'-8', ND

AOC-13-MW-20I
6'-6.4', 62.87

AOC-12-GP-09
7'-8', 0.027

AOC-12-GP-02
6'-7', ND

MW-C
3'-7', 0.0134

AOC-11-GP-03
6'-7', 0.94

AOC-12-GP-06
7'-8', ND

MAIN
PARKING
LOT

AOC-01-MW-11I
6'-8', 0.405

SB-61
6'-8', 2.372

KENMORE AVE

Legend

Total SVOC Concentration (mg/kg):

- ND
- < 10
- 10 - 100
- 100 - 500
- > 500

50' Grid

Test Pit

Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL SVOCS - 6'-8' BGS

AECOM

FIGURE 14

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL SVOCS_Soils_6-8ft.mxd 9/24/2020

N

AOC-16-GP-04
8'-9', ND

SB-36
8'-10', 0.015

SB-26
8'-10', 0.0917

SB-06
8'-10', 0.5223

AOC-07-GP-02
8'-8.5', ND

AOC-08-MW-07S
8'-10', 6.82

AOC-03-GP-02
9'-10', ND

AOC-03-GP-05
8'-9', 0.508

SB-12
8'-10', 2.626

AOC-14-GP-05
7.8'-8.2', 0.993

SB-08
8'-10', 0.3813

AOC-03-GP-01
9'-10', ND

AOC-14-MW-21I
8.2'-8.4', 8.05

SB-03
8'-10', 4.057

AOC-14-MW-21I
9'-10', 1.464

AOC-13-SB-08
8'-9', ND

SB-29
8'-10', 0.0413

AOC-13-SB-07
8'-9', ND

AOC-13-SB-05
8.5'-9.5', ND

AOC-10-SB-04
8'-10', 0.9848

AOC-11-GP-04
8'-9', ND

AOC-10-SB-14
8'-10', 1.1289

MAIN
PARKING
LOT

SB-65
8'-10', 0.0709

KENMORE AVE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Legend

Total SVOC Concentration (mg/kg):

- ND
- < 10
- 10 - 100
- 100 - 500
- > 500
- 50' Grid
- Test Pit
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL SVOCS - 8'-10' BGS

AECOM

FIGURE 15

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL SVOCS_Soils_8-10ft.mxd 9/24/2020

N

SB-45
8'-12', 1.46

AOC-06-MW-06I
10'-12', ND

SB-17
10'-12', 4.227

AOC-05-SB-04
10'-10.7', 0.27

AOC-14-GP-05
10.5'-11', 1.739

SB-27
10'-12', 1.188

SB-19
10'-12', 1.29

SB-50
10'-12', 0.0312

SB-23
8'-12', 4.511

MW-B
9'-11', 0.0266

AOC-10-SB-11
10'-12', 0.804

AOC-10-SB-13
10'-11', 0.191

MAIN
PARKING
LOT

SB-74
10'-12', ND

SB-78
10'-12', ND

KENMORE AVE

Legend

Total SVOC Concentration (mg/kg):

- ND
- < 10
- 10 - 100
- 100 - 500
- > 500
- 50' Grid
- Test Pit
- Area of Concern

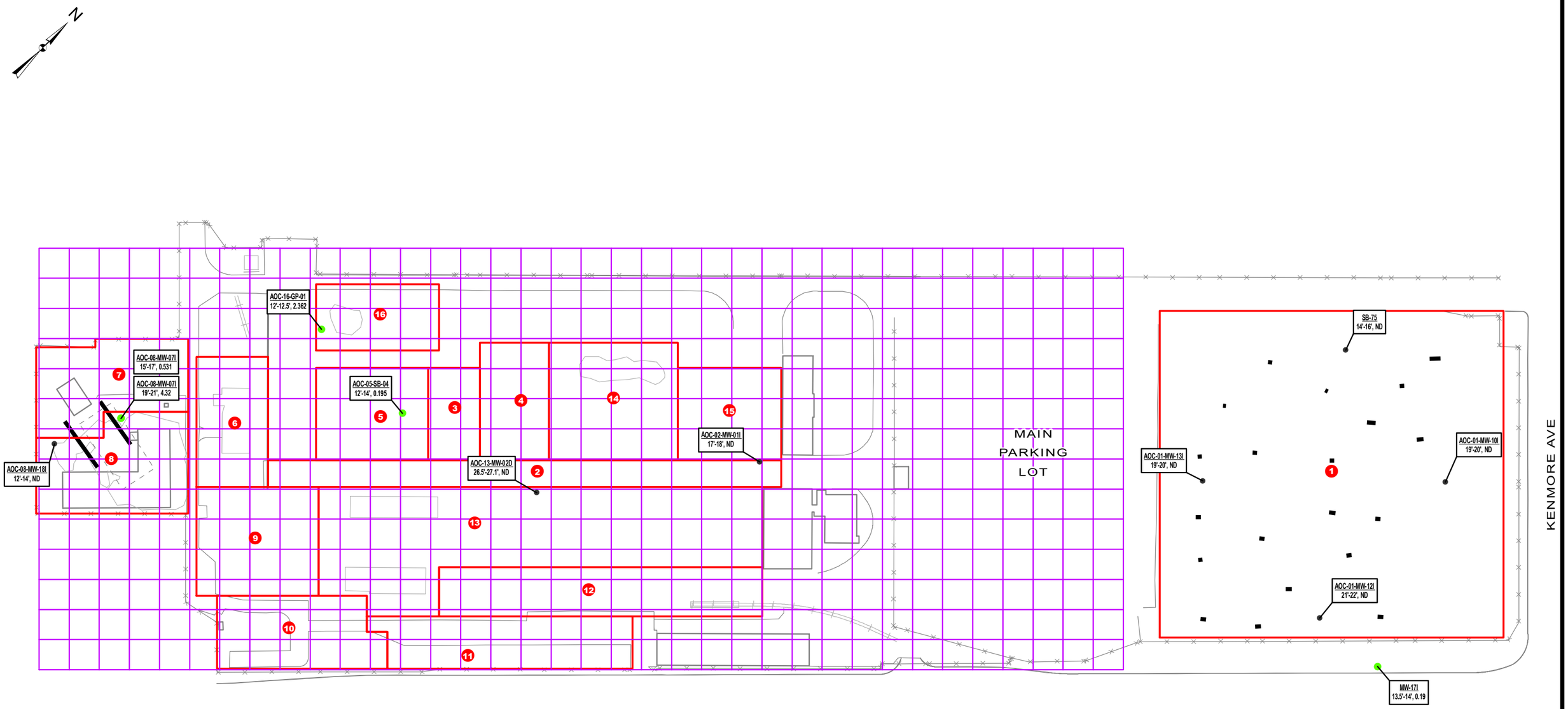
160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL SVOCS - 10'-12' BGS

AECOM

FIGURE 16

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL SVOCS_Soils_10-12ft.mxd 9/22/2020



Legend

Total SVOC Concentration (mg/kg):

- ND
- < 10
- 10 - 100
- 100 - 500
- > 500
- 50' Grid
- Test Pit
- Area of Concern

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
TOTAL SVOCS - 12'-28' BGS

AECOM

FIGURE 17

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\TOTAL SVOCS_Soils_12-28ft.mxd 9/24/2020

N

ENVIRONMENTAL BUILDING

FORMER TANK FARM

ADMINISTRATION BUILDING

MAIN PARKING LOT

CAFETERIA

NET SHAPE GEAR WAREHOUSE

KENMORE AVE

Existing Storm Sewer System

UAW-GM BLVD

Exisiting permitted discharge to river

Existing Storm Sewer System

Legend

- Existing Storm Sewer System
- Proposed Onsite Sewer System
- Sewer to be cleaned and sealed
- Areas of Concern

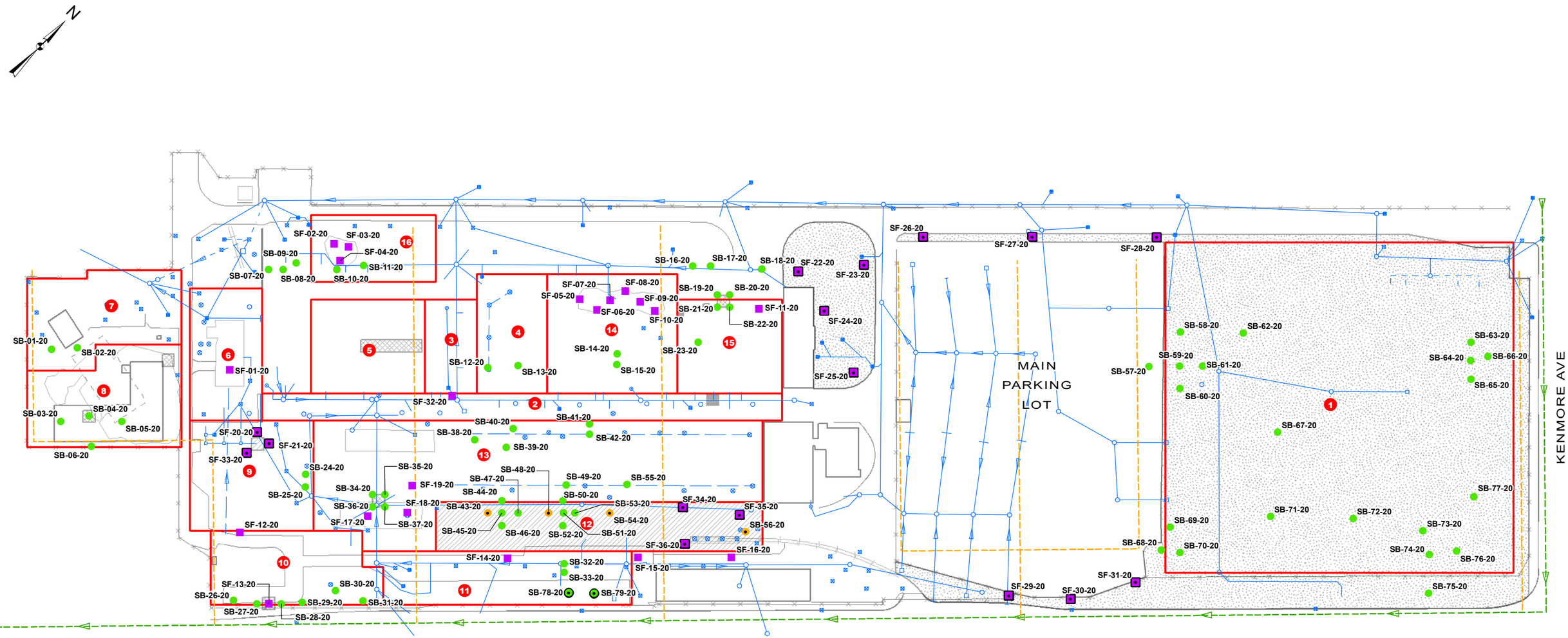
200 0 200 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
SURFACE WATER CONTROL

AECOM

FIGURE 18

J:\Projects\11176989\GIS\MAPS\04 Surface Water Control.mxd 9/9/2020



Legend

- Proposed Surface Soil Sample (TCL Semivolatiles, TAL Metals, Mercury, and PCB Analysis)
- Proposed Surface Soil Sample (PCB Analysis Only)
- Proposed Subsurface Soil Sample (TCL Semivolatiles, TAL Metals, Mercury at Surface Only, and PCB Analysis at All Depths)
- Proposed Subsurface Soil Sample (TCL Semivolatiles, TAL Metals, Mercury, and PCB Analysis)
- Proposed Subsurface Soil Sample (PCB Analysis Only)
- Area of Concern
- One-foot Surface Cover
- Surface Soil Excavation
- Subsurface Soil Excavation
- Concrete or Brick Removal

NOTES:
1. The Surface Water, Sediment, Concrete, and Test Pit Locations will be determined in the field and after consulation with NYSDEC.
2. Excavation areas based upon data presented in the RI and evaluated as part of the Feasibility Study (AECOM, September 2019).
3. Based on Field Screening Results 23 locations will be selected for TCL Volatile analysis.

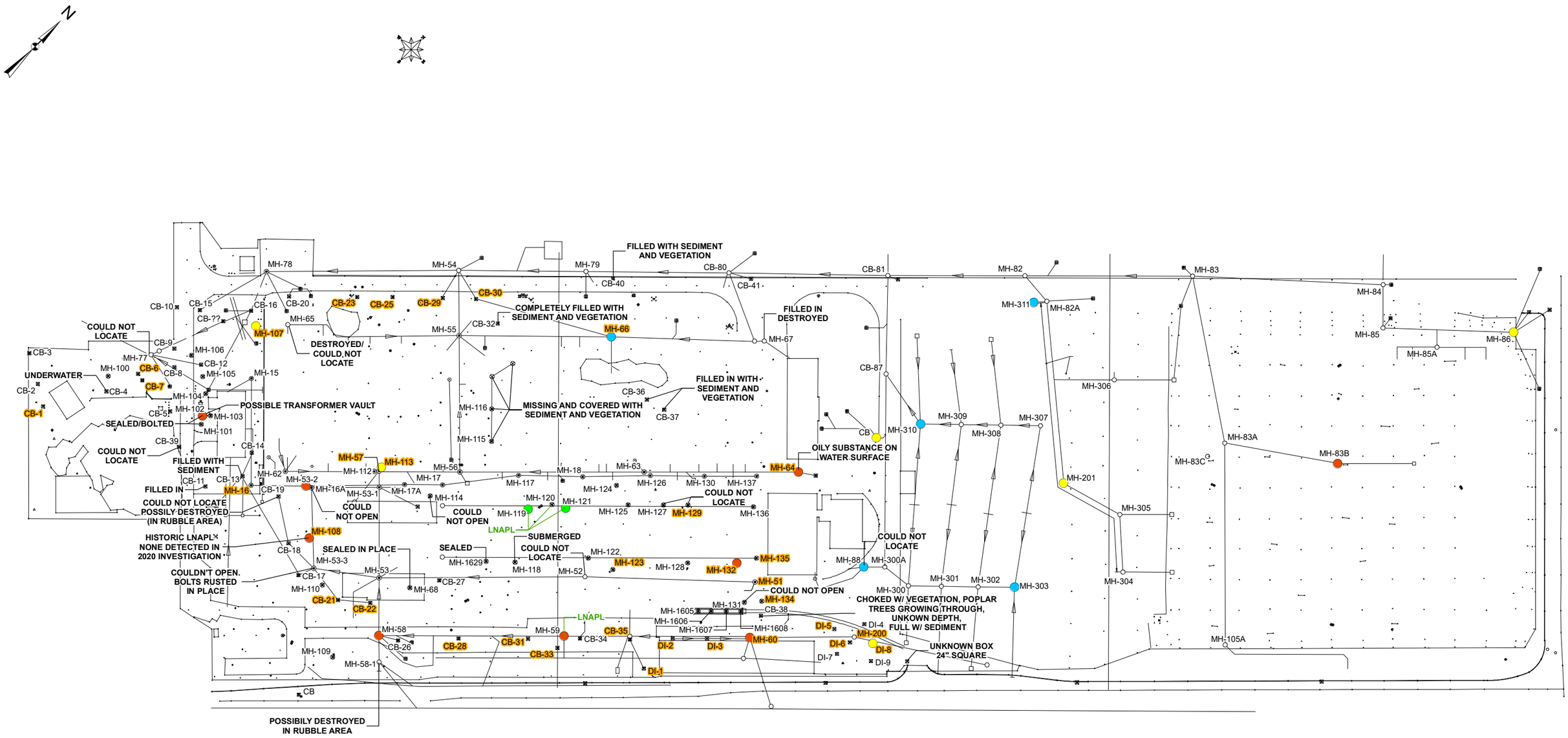
160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
PROPOSED SAMPLING LOCATIONS

AECOM

FIGURE 19

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\Proposed_Sampling_Location_Rev.mxd 11/3/2020



Legend

- Proposed Sewer Water and Sediment Sample Location
- Proposed Sewer Water and Sediment Sample Location with POTW Water Quality Parameters
- Proposed LNAPL Sample Location
- Proposed Surface WaterSample Location
- CB-1 Sheen on Water

MH-59: 3-4" LNAPL
MH-119: 8" LNAPL
MH-120: 6" LNAPL
MH-121: 3" LNAPL

160 0 160 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
PROPOSED SEWER WATER, SEDIMENT, SURFACE WATER, AND LNAPL SAMPLE LOCATIONS

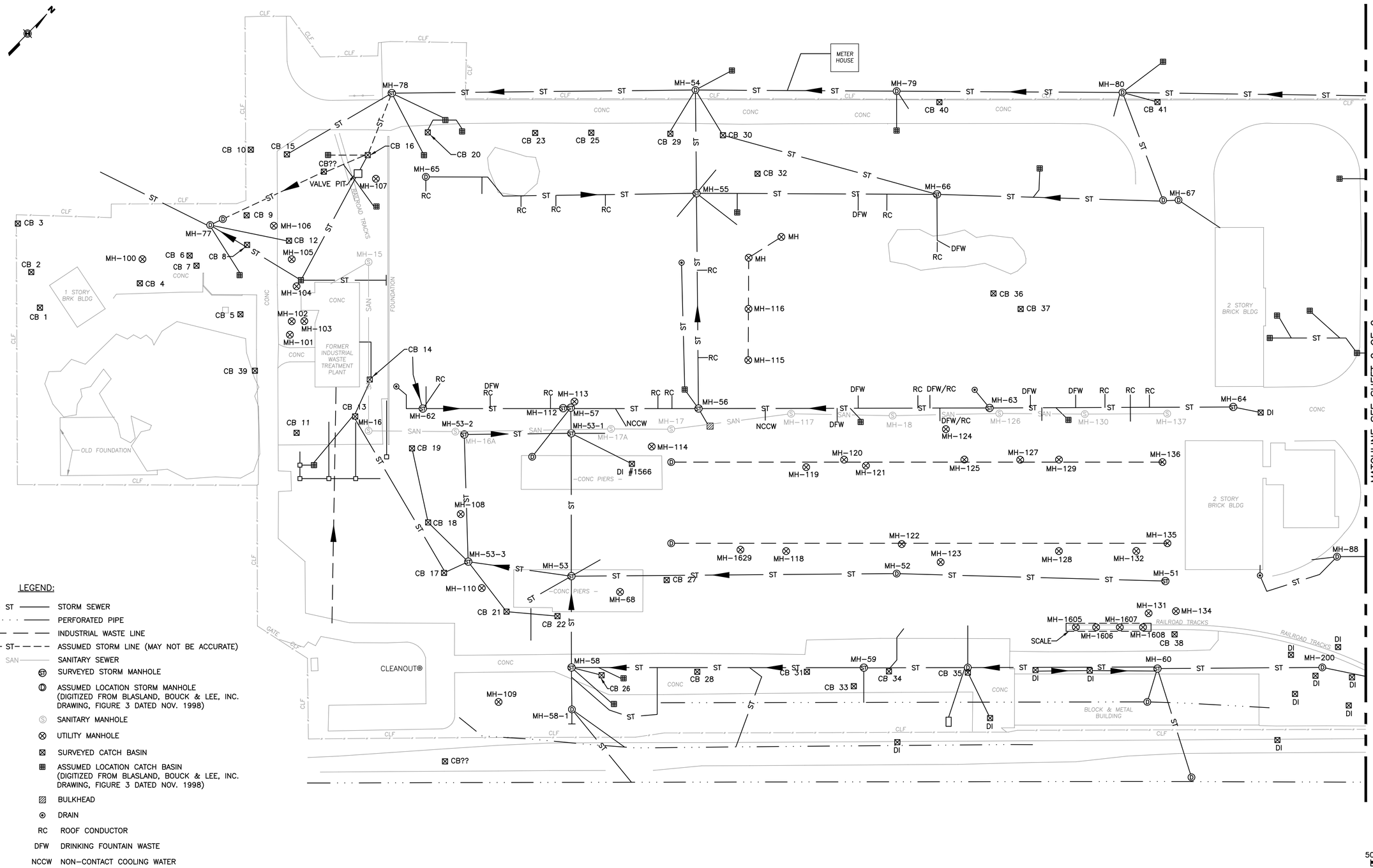
AECOM

FIGURE 20

C:\Users\maxwell.reis\Documents\Tonawanda_Forge\MAPS\AECOM_2020_Proposed_Sampling_Locations_REV.mxd 11/20/2020

PLATES

Per memo from the owner of this property that is attached with the original deed of transfer of the property, all rights to the information contained on this drawing is retained by the owner.



MATCHLINE SEE SHEET 2 OF 2

LEGEND:

- ST — STORM SEWER
- PERFORATED PIPE
- INDUSTRIAL WASTE LINE
- ST — ASSUMED STORM LINE (MAY NOT BE ACCURATE)
- SAN — SANITARY SEWER
- (ST) SURVEYED STORM MANHOLE
- (D) ASSUMED LOCATION STORM MANHOLE (DIGITIZED FROM BLASLAND, BOUCK & LEE, INC. DRAWING, FIGURE 3 DATED NOV. 1998)
- (S) SANITARY MANHOLE
- ⊗ UTILITY MANHOLE
- ⊠ SURVEYED CATCH BASIN
- ▦ ASSUMED LOCATION CATCH BASIN (DIGITIZED FROM BLASLAND, BOUCK & LEE, INC. DRAWING, FIGURE 3 DATED NOV. 1998)
- ▨ BULKHEAD
- ⊙ DRAIN
- RC ROOF CONDUCTOR
- DFW DRINKING FOUNTAIN WASTE
- NCCW NON-CONTACT COOLING WATER

DRAFT

50' 0 50'
SCALE IN FEET

WARNING
IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON OTHER THAN WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

DESIGNED BY: .
DRAWN BY: RAL
CHECKED BY: .
PROJ. ENGR. .

AECOM
257 West Genesee Street, Suite 400, Buffalo, New York 14202
(716)856-5636 - (716)856-2545 fax

JOB NO. 11176989

TONAWANDA FORGE
TOWN OF TONAWANDA NEW YORK

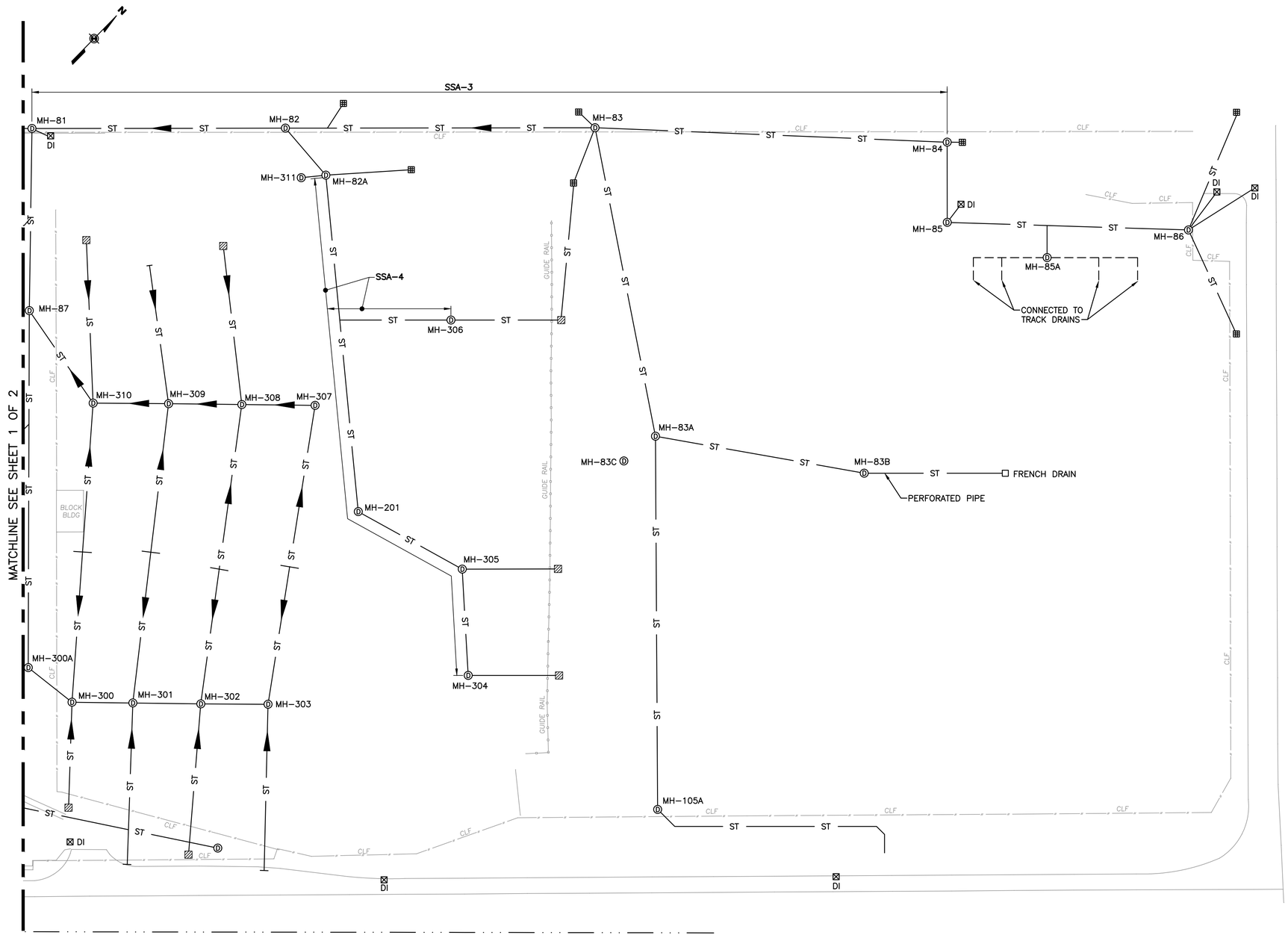
TONAWANDA FORGE
SITE #915274

SEWER SYSTEM
(SHEET 1 OF 2)

Scale: AS SHOWN | Date: MAY 2014 | PLATE 1

This drawing was originally created by AECOM and is the property of AECOM. Any unauthorized use of this drawing is prohibited by law.

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LEGEND:

- ST — STORM SEWER
- PERFORATED PIPE
- INDUSTRIAL WASTE LINE
- ST — ASSUMED STORM LINE (MAY NOT BE ACCURATE)
- SAN — SANITARY SEWER
- SURVEYED STORM MANHOLE
- ASSUMED LOCATION STORM MANHOLE (DIGITIZED FROM BLASLAND, BOUCK & LEE, INC. DRAWING, FIGURE 3 DATED NOV. 1998)
- S — SANITARY MANHOLE
- UTILITY MANHOLE
- SURVEYED CATCH BASIN
- ASSUMED LOCATION CATCH BASIN (DIGITIZED FROM BLASLAND, BOUCK & LEE, INC. DRAWING, FIGURE 3 DATED NOV. 1998)
- BULKHEAD
- DRAIN
- RC — ROOF CONDUCTOR
- DFW — DRINKING FOUNTAIN WASTE
- NCCW — NON-CONTACT COOLING WATER

DRAFT

50' 0 50'
SCALE IN FEET

Any copies from the original of this drawing that are produced with the original seal or signature of the Professional Engineer or Land Surveyor shall be considered as a valid copy.

WARNING
IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON OTHER THAN WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

DESIGNED BY: .
DRAWN BY: RAL
CHECKED BY: .
PROJ. ENGR. .

AECOM
57 West Genesee Street, Suite 400, Buffalo, New York 14202
(716)856-5636 - (716)856-2545 fax

JOB NO. 11176989

TONAWANDA FORGE
TOWN OF TONAWANDA NEW YORK

TONAWANDA FORGE
SITE #915274

SEWER SYSTEM
(SHEET 2 OF 2)

Scale: AS SHOWN | Date: MAY 2014 | PLATE 1

The drawing was computer generated and drafted and any revisions should be made by the owner's authorized agent.

J:\Projects\11176989\CADD\C-001 - C-002.dwg, SHEET 2, 12:58, 8/1/14 -1-RAL

ENVIRONMENTAL BUILDING

FORMER TANK FARM

ADMINISTRATION BUILDING

CAFETERIA

NET SHAPE GEAR WAREHOUSE

MATCHLINE - SEE SHEET 2

Legend

- Monitoring Well
- Surface Water Sample
- Chip Sample (Concrete, Brick, & Asphalt)
- Geoprobe Sample
- Grab Sample (Bulk Solids)
- Wipe Sample
- Piezometer
- Soil Boring
- Surface Soil Sample
- AST & Pipe Sample
- Test Trench Sample
- Standpipe Sample
- Manhole
- Catch Basin
- Test Pit
- Area of Concern
- Debris/Waste Pile (Removed Feb. 2016)

100 0 100 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
RI SAMPLING LOCATIONS

AECOM

PLATE 2
(SHEET 1 OF 2)

C:\Users\maxwell.lee\Documents\Tonawanda_Forge\MAPS\PLATE 02 RI MW SB CC SS LOCATIONS.mxd 11/24/2020

MATCHLINE - SEE SHEET 1

SS-11

SS-10

MW-23I

SS-09

SS-08

AOC-01-TP-05

AOC-01-MW-11I

AOC-01-MW-11S

AOC-01-TP-09

AOC-01-TP-10

AOC-01-TP-X02

AOC-01-MW-14S

AOC-01-TP-X10

AOC-01-LF-SW-01

AOC-01-TP-08

AOC-01-TP-11

AOC-01-TP-X03

AOC-01-TP-X09

AOC-01-TP-X01

1

AOC-01-MW-13S

AOC-01-MW-13I

AOC-01-MW-10I

AOC-01-MW-10S

SS-07

AOC-01-TP-14

AOC-01-TP-X08

AOC-01-TP-15

AOC-01-TP-02

AOC-01-TP-20

AOC-01-TP-X07

AOC-01-TP-X04

SS-06

AOC-01-TP-X06

AOC-01-MW-12S

AOC-01-MW-12I

AOC-01-TP-23

AOC-01-TP-X05

AOC-01-MW-15S

SS-05

SS-04

MW-J

MW-17I

SS-03

PARK LOT WATER

MAIN PARKING LOT

MW-22S

MW-22I

KENMORE AVE

UAW-GM BLVD

Legend

- Monitoring Well
- Surface Water Sample
- Chip Sample (Concrete, Brick, & Asphalt)
- Geoprobe Sample
- Grab Sample (Bulk Solids)
- Wipe Sample
- Piezometer
- Soil Boring
- Surface Soil Sample
- AST & Pipe Sample
- Test Trench Sample
- Standpipe Sample
- Manhole
- Catch Basin
- Test Pit
- 1 Area of Concern
- 1 Debris/Waste Pile (Removed Feb. 2016)

100 0 100 Feet

NYSDEC TONAWANDA FORGE
TOWN OF TONAWANDA, NEW YORK
RI SAMPLING LOCATIONS

AECOM

PLATE 2
(SHEET 2 OF 2)

C:\Users\mrowell.test\Documents\Tonawanda_Forge\MAPS\PLATE 02 RI MW EB GC SS LOCATIONS.mxd 11/24/2020

APPENDIX A

Generic Field Activities Plan

Avalable Upon Request

APPENDIX B

Generic Quality Assurance Project Plan

Avalable Upon Request

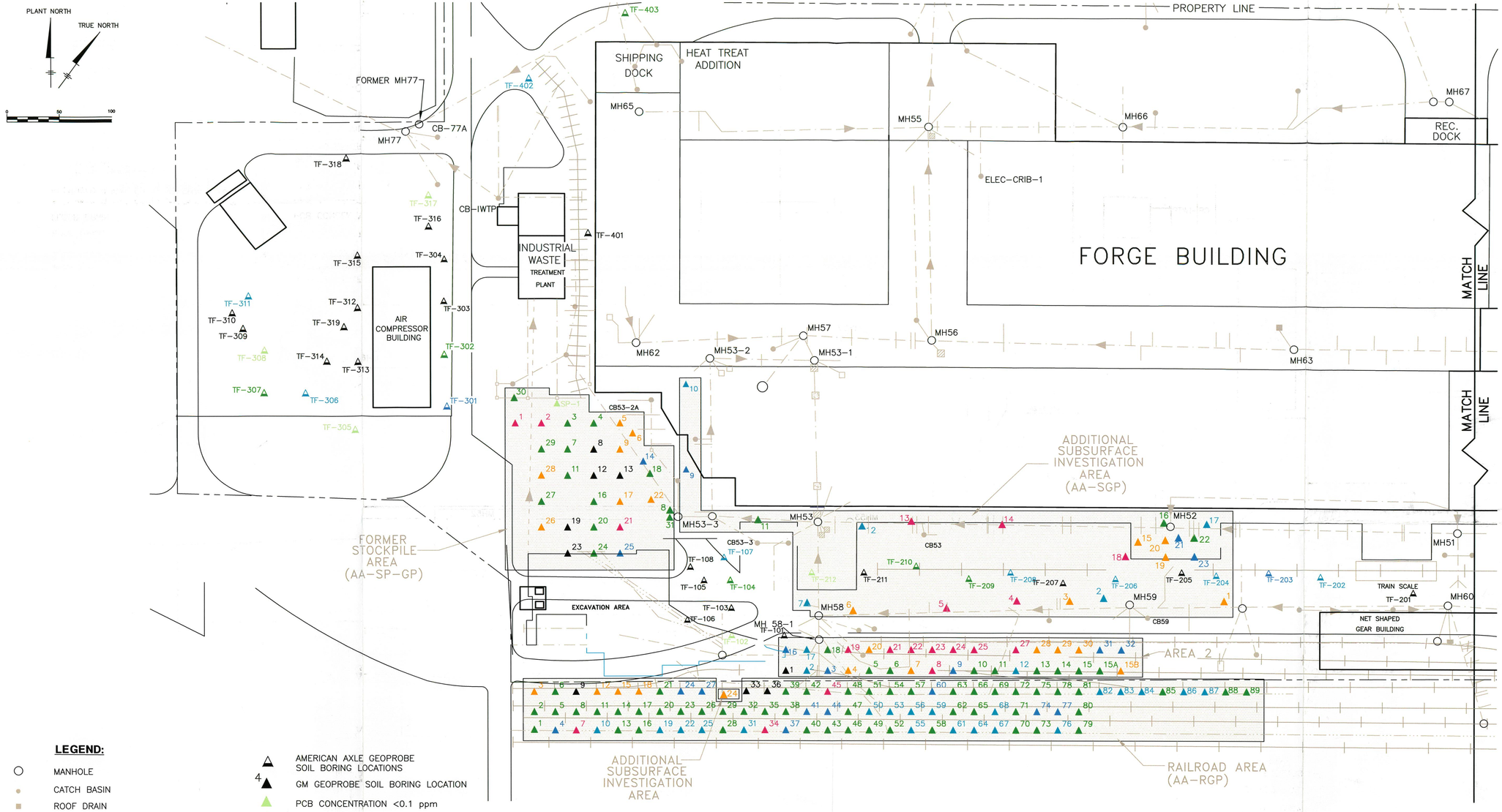
APPENDIX C

Site Specific Health and Safety Plan

Avalable Upon Request

APPENDIX D

Immunoassay Results



LEGEND:

- MANHOLE
- CATCH BASIN
- ROOF DRAIN
- FLOOR DRAIN
- BULKHEAD INSTALLED BY OTHERS
- BULKHEAD INSTALLED IN NOVEMBER 1998
- CONCRETE FOUNDATION OBSTRUCTION
- PROPERTY LINE
- STORM SEWER PIPING
- PERFORATED PIPE
- INDUSTRIAL WASTE LINE
- DIRECTION OF FLOW
- PIPING REMOVED

- AMERICAN AXLE GEOPROBE SOIL BORING LOCATIONS
- 4 GM GEOPROBE SOIL BORING LOCATION
- PCB CONCENTRATION <0.1 ppm
- PCB CONCENTRATION <1 ppm
- PCB CONCENTRATION 1–5 ppm
- PCB CONCENTRATION 5–10 ppm
- PCB CONCENTRATION 10–50 ppm
- PCB CONCENTRATION >50 ppm

ppm PARTS PER MILLION
PCB POLYCHLORINATED BIPHENYL

LOCATIONS IN BLACK (NO COLOR) INDICATE SAMPLE WAS NOT TESTED FOR PCB's.

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. THIS DRAWING WAS REPRODUCED FROM FIGURE 3 IN THE PHASE III EXTENT OF CONTAMINATION STUDY PREPARED BY BLASLAND, BOUCK & LEE (BB&L), DATED 4/5/99.
3. REFERENCE: HALEY & ALDRICH DRAWING BUFFEXPL.DWG, FILE NO. 70464-051. APPROXIMATE LOCATIONS OF SITE FEATURES WERE ADDED BASED ON OBSERVATIONS MADE BY HALEY & ALDRICH, INC.
4. REFERENCE: CHEV. DRAWINGS; PEF-D2, 9/15/55, PEF-B-234, 4/27/66, PEF-D-5, 9/1955, PEF-B-202, 5/24/85.
5. REFERENCE: HARLEY, ELLINGTON, CONWN, AND STIRTON, INC. JOB No. 1830-A DWG. No. MI AND JOB No. 1830-B DWG No. MI
6. OFFICE OF J. FRUCHTBAUM JOB No. 4653, SHEET U-1

No	Revision	Date	Initial

Approved

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

BB&L (FORGE) RAILROAD DRAINAGE LINE INVESTIGATION

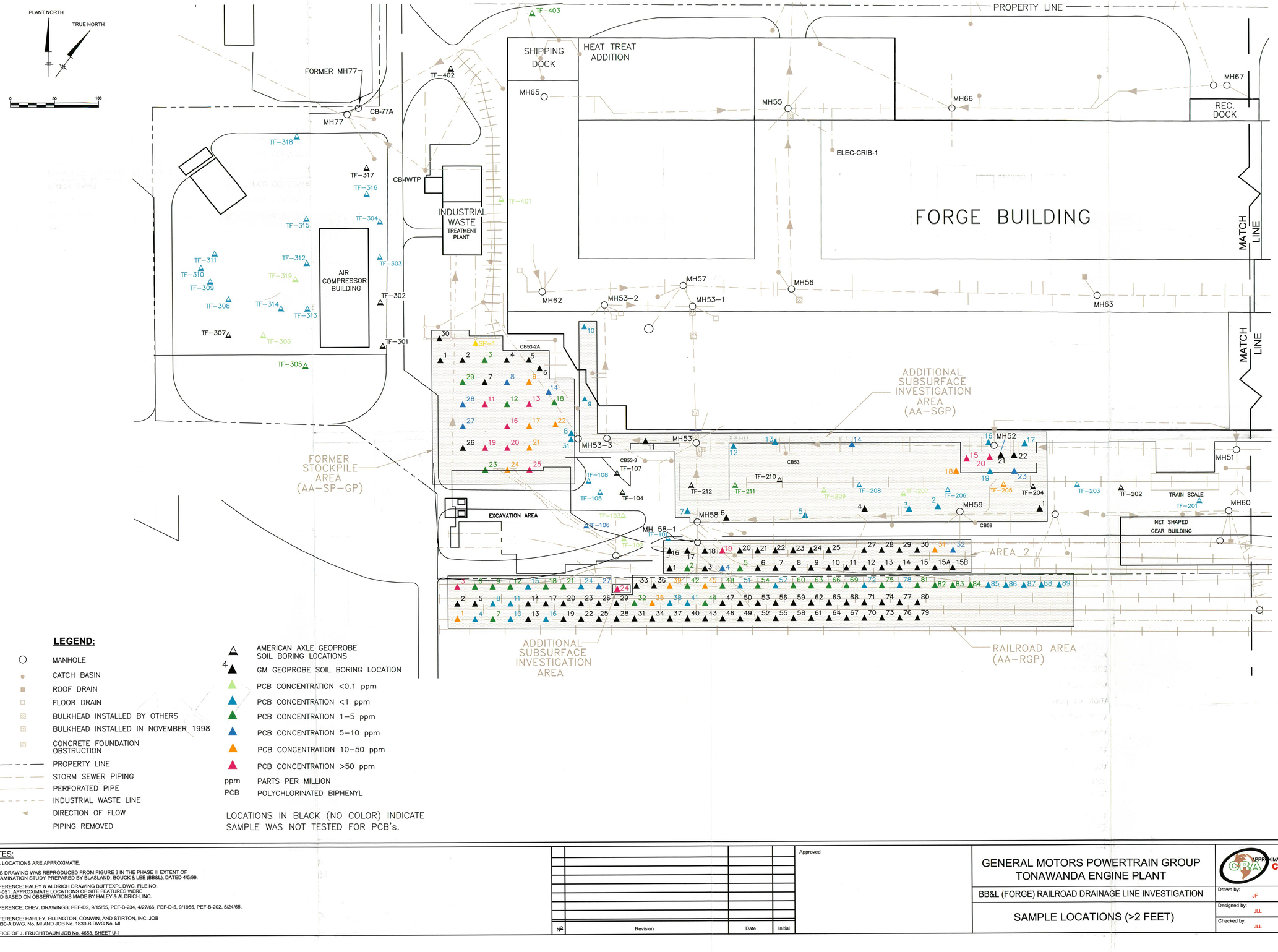
SAMPLE LOCATIONS (0-2 FEET)

APPROXIMATE SCALE IN FEET

CONESTOGA-ROVERS & ASSOCIATES

Drawn by:	Scale:	Date:	File No.:	Rev.No.:
JF	AS SHOWN	NOVEMBER 2000	GN-002	1
Designed by: JLL				
Checked by: JLL	Field book:	Project No.: 17056-12	Drawing No.: 2	

17056-12(011)NOV 06/2000



LEGEND:

- MANHOLE
- CATCH BASIN
- ROOF DRAIN
- FLOOR DRAIN
- BULKHEAD INSTALLED BY OTHERS
- BULKHEAD INSTALLED IN NOVEMBER 1998
- CONCRETE FOUNDATION OBSTRUCTION
- PROPERTY LINE
- STORM SEWER PIPING
- PERFORATED PIPE
- INDUSTRIAL WASTE LINE
- DIRECTION OF FLOW
- PIPING REMOVED

- AMERICAN AXLE GEOPROBE SOIL BORING LOCATIONS
- GM GEOPROBE SOIL BORING LOCATION
- PCB CONCENTRATION <0.1 ppm
- PCB CONCENTRATION <1 ppm
- PCB CONCENTRATION 1–5 ppm
- PCB CONCENTRATION 5–10 ppm
- PCB CONCENTRATION 10–50 ppm
- PCB CONCENTRATION >50 ppm

ppm PARTS PER MILLION
PCB POLYCHLORINATED BIPHENYL

LOCATIONS IN BLACK (NO COLOR) INDICATE SAMPLE WAS NOT TESTED FOR PCB's.

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. THIS DRAWING WAS REPRODUCED FROM FIGURE 3 IN THE PHASE III EXTENT OF CONTAMINATION STUDY PREPARED BY BLASLAND, BOUCK & LEE (BB&L), DATED 4/5/99.
3. REFERENCE: HALEY & ALDRICH DRAWING BUFFEXPL.DWG, FILE NO. 70464-051, APPROXIMATE LOCATIONS OF SITE FEATURES WERE ADDED BASED ON OBSERVATIONS MADE BY HALEY & ALDRICH, INC.
4. REFERENCE: CHEV. DRAWINGS; PEF-D2, 9/15/55, PEF-B-234, 4/27/66, PEF-D-5, 9/1955, PEF-B-202, 5/24/65.
5. REFERENCE: HARLEY, ELLINGTON, CONWIN, AND STIRTON, INC. JOB No. 1830-A DWG. No. MI AND JOB No. 1830-B DWG No. MI
6. OFFICE OF J. FRUCHTBAUM JOB No. 4653, SHEET U-1

No.	Revision	Date	Initial

Approved

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

BB&L (FORGE) RAILROAD DRAINAGE LINE INVESTIGATION

SAMPLE LOCATIONS (>2 FEET)

APPROXIMATE SCALE IN FEET

CONESTOGA-ROVERS & ASSOCIATES

Drawn by: JF	Scale: AS SHOWN	Date: NOVEMBER 2000	File No.: GN-002A	Rev.No.: 1
Designed by: JLL				
Checked by: JLL	Field book:	Project No.: 17056-12	Drawing No.: 2A	

17056-12(011)NOV 06/2000

BLDG. NORTH
TRUE NORTH

0 100 200
SCALE IN FEET

DU PONT

DU PONT
PARKING

PIPE TRESTLE

PROPERTY LINE

STORM SEWER
INTERCEPTOR SYSTEM

GRIT SEP.

OWS

PARKING AREA

NORTH DOCK "B"

IWTP

WT

POWER PLANT

PROPERTY LINE

PARKING AREA

PARKING AREA

FORMER WWTP
SETTLING TANKS
(DEMOLISHED 1998)

PC & L
BUILDING

FORMER
SCRAP PITS

G. M. POWER TRAIN
MOTOR PLANT 1

RIVER PUMP
HOUSE

SOUTH BOUND NYS I-190

NORTH BOUND NYS I-190

RIVER ROAD

PARKING AREA

FORMER
SCRAP PITS

N I A G A R A R I V E R

PARKING AREA

COOLANT FILTRATION BUILDING

C.W.

PARKING AREA

PROPERTY LINE

EDGAR AVE.

STORAGE
AREA

NYS THRUWAY

RIVER ROAD

GROVER PL.

TONAWANDA ST.

IRENE ST.

PROPERTY LINE

HELICOPTER
LANDING PAD

UNPAVED

PROPERTY LINE

VULCAN ST.

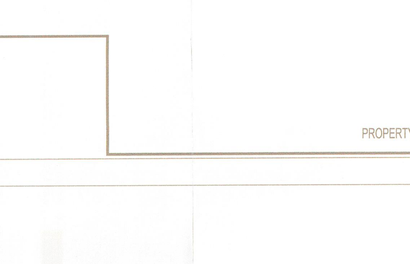
LEGEND

- ACTIVE RAILROAD LINES
- HISTORICAL RAILROAD LINES
- POTENTIAL AREAS OF INTEREST
- AREAS OF FURTHER INVESTIGATION (THESE AREAS ARE RECOMMENDED TO BE FURTHER INVESTIGATED TO EVALUATE ANOMALOUS DETECTIONS)

PCB CONCENTRATIONS:

- AUGER REFUSAL/NOT ACCESSIBLE
- ND = < 1.0 ppm (mg/kg)
- 1.0 – 5.0 ppm (mg/kg)
- 5.0 – 10 ppm (mg/kg)
- 10 – 50 ppm (mg/kg)
- > 50 ppm (mg/kg)

KEY MAP



NOTES:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN," TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWINGS PROVIDED BY GMPTG ENGINEERING DEPT., TONWANDA, NY, DATE: 3/99 AND THE IT CORPORATION, GRAND ISLAND, NY, DATE: 8/00.
3. ALL DIMENSIONS ARE APPROXIMATE.

№	Revision	Date	Initial

Approved

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

RAILROAD DRAINAGE LINE INVESTIGATION

FIELD SCREENING RESULTS (0-4 FT)

CONESTOGA-ROVERS & ASSOCIATES

Drawn by:	Scale:	Date:	File №:	Rev.№:
JF	AS SHOWN	NOVEMBER 2000	GN-003	1
Designed by: JLL				
Checked by: JLL	Field book:	Project №: 17056-12	Drawing №: 3	

17056-12(011)NOV 06/2000

0 100 200
SCALE IN FEET

TRUE NORTH
BLDG. NORTH

PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE

15 ACRES
PARKING
REC. AREA
FORMER SCRAP PITS
WATER TANK
FIRE PREVENTION BLDG
(AMERICAN AXLE OPERATOR BLDG)

G. M. POWER TRAIN
MOTOR PLANT 4

EXIST. CONCRETE PV'MT.
FORMER WWTP
SETTLING TANKS
(DEMOLISHED 1998)

NITROGEN BULK TANK
ALUM CHIP SILO
PARKING AREA
115KVSUB STATION

AMERICAN AXLE & MANUFACTURING

PARKING AREA

EXIST. CONCRETE PV'MT.

KENMORE AVE.

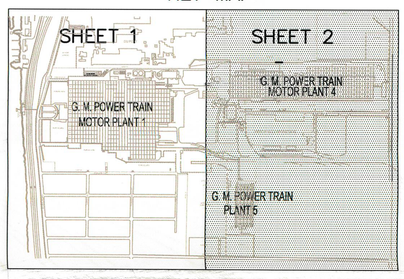
G. M. POWER TRAIN
PLANT 5

ALUM CHIP SILO

PARKING

PROPERTY LINE

KEY MAP



LEGEND

- ACTIVE RAILROAD LINES
- HISTORICAL RAILROAD LINES
- POTENTIAL AREAS OF INTEREST
- AREAS OF FURTHER INVESTIGATION (THESE AREAS ARE RECOMMENDED TO BE FURTHER INVESTIGATED TO EVALUATE ANOMALOUS DETECTIONS)

PCB CONCENTRATIONS:

- AUGER REFUSAL/NOT ACCESSIBLE
- ND = < 1.0 ppm (mg/kg)
- 1.0 – 5.0 ppm (mg/kg)
- 5.0 – 10 ppm (mg/kg)
- 10 – 50 ppm (mg/kg)
- > 50 ppm (mg/kg)

NOTES:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN," TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWINGS PROVIDED BY GMPTG ENGINEERING DEPT., TONWANDA, NY, DATE: 3/99 AND THE IT CORPORATION, GRAND ISLAND, NY, DATE: 8/00.
3. ALL DIMENSIONS ARE APPROXIMATE.

No	Revision	Date	Initial

Approved

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

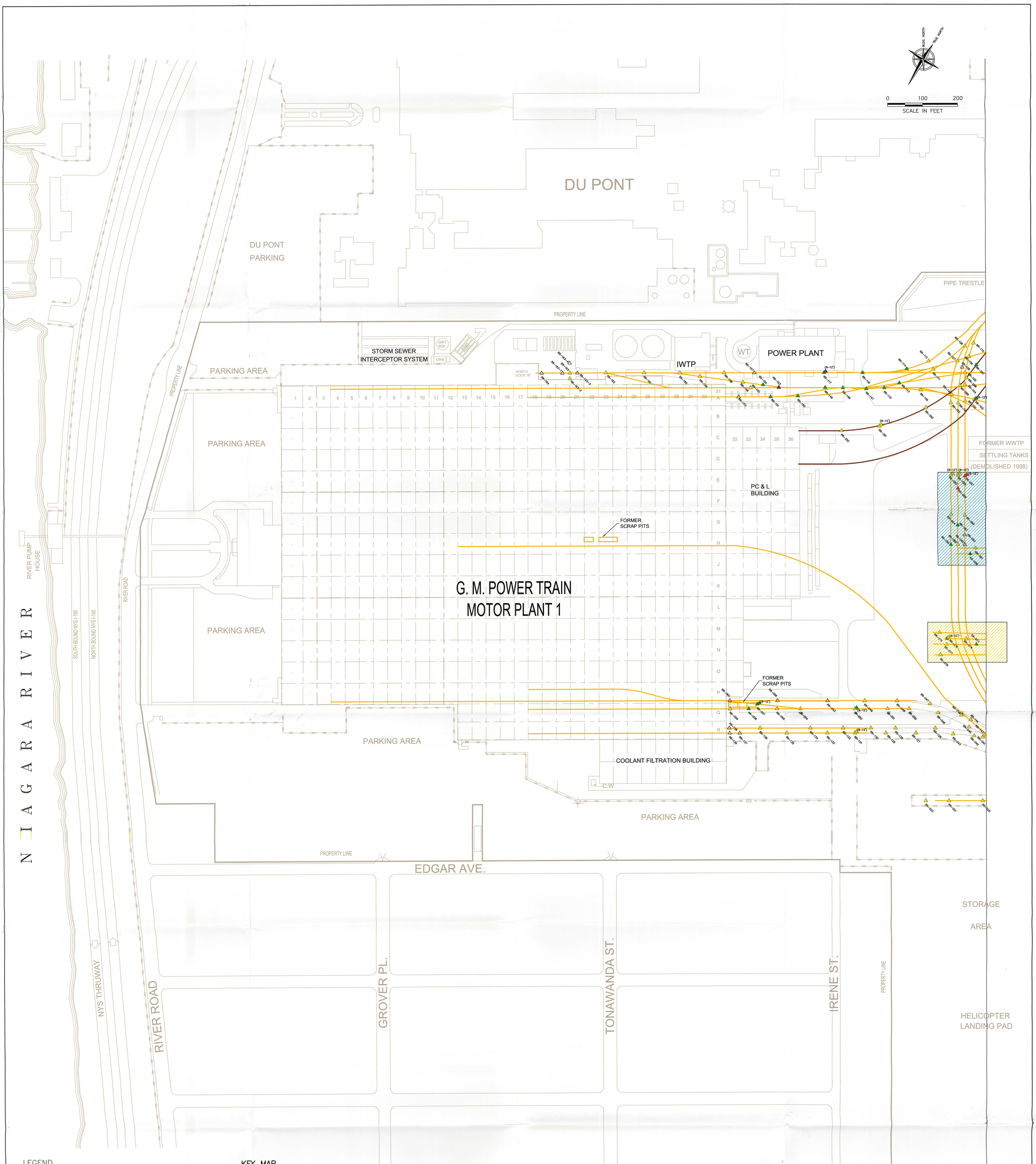
RAILROAD DRAINAGE LINE INVESTIGATION

FIELD SCREENING RESULTS (0-4 FT)

CONESTOGA-ROVERS & ASSOCIATES

Drawn by:	Scale:	Date:	File No.:	Rev.No.:
JF	AS SHOWN	NOVEMBER 2000	GN-003	1
Designed by: JLL				
Checked by: JLL	Field book:	Project No.: 17056-12	Drawing No.: 3A	

17056-12(011)NOV 06/2000



LEGEND

- ACTIVE RAILROAD LINES
- HISTORICAL RAILROAD LINES
- POTENTIAL AREAS OF INTEREST
- AREAS OF FURTHER INVESTIGATION (THESE AREAS ARE RECOMMENDED TO BE FURTHER INVESTIGATED TO EVALUATE ANOMALOUS DETECTIONS)

PCB CONCENTRATIONS:

- AUGER REFUSAL/NOT ACCESSIBLE
- ND = < 1.0 ppm (mg/kg)
- 1.0 – 5.0 ppm (mg/kg)
- 5.0 – 10 ppm (mg/kg)
- 10 – 50 ppm (mg/kg)
- > 50 ppm (mg/kg)

KEY MAP

NOTES:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN," TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWINGS PROVIDED BY GMPTG ENGINEERING DEPT., TONWANDA, NY, DATE: 3/99 AND THE IT CORPORATION, GRAND ISLAND, NY, DATE: 8/00.
3. ALL DIMENSIONS ARE APPROXIMATE.
4. FIELD SCREENING RESULTS ARE 4' TO 8' IN DEPTH UNLESS NOTED IN PARENTHESES.

№	Revision	Date	Initial

Approved

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

RAILROAD DRAINAGE LINE INVESTIGATION

FIELD SCREENING RESULTS (4-12 FT)

CONESTOGA-ROVERS & ASSOCIATES

Drawn by:	Scale:	Date:	File №:	Rev.№:
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Designed by: JLL				
Checked by: JLL	Field book:	Project №: 17056-12	Drawing №: 4	

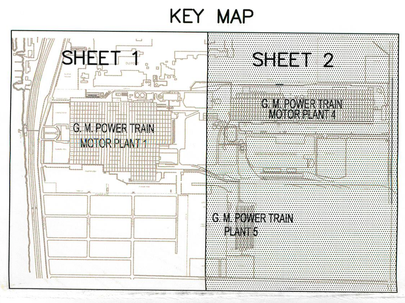
17056-12(011)NOV 06/2000

0 100 200
SCALE IN FEET

BLDG. NORTH
TRUE NORTH

PROPERTY LINE
PROPERTY LINE
15 ACRES
PARKING
PROPERTY LINE
RR SCALE
REC. AREA
FORMER SCRAP PITS
WATER TANK
G. M. POWER TRAIN
MOTOR PLANT 4
FIRE PREVENTION BLDG (EMERGENCY GENERATOR BLDG)
EXIST. CONCRETE PV'MT.
FORMER WWTP
SETTLING TANKS
(DEMOLISHED 1998)
NITROGEN BULK TANK
ALUM CHIP SILO
PARKING AREA
115KVSUB STATION
AMERICAN AXLE & MANUFACTURING
PARKING AREA
PROPERTY LINE
KENMORE AVE.
EXIST. CONCRETE PV'MT.
PROPERTY LINE
G. M. POWER TRAIN
PLANT 5
ALUM CHIP SILO
PARKING
PROPERTY LINE

KEY MAP



LEGEND

- ACTIVE RAILROAD LINES
- HISTORICAL RAILROAD LINES
- POTENTIAL AREAS OF INTEREST
- AREAS OF FURTHER INVESTIGATION (THESE AREAS ARE RECOMMENDED TO BE FURTHER INVESTIGATED TO EVALUATE ANOMALOUS DETECTIONS)

PCB CONCENTRATIONS:

- AUGER REFUSAL/NOT ACCESSIBLE
- ND = < 1.0 ppm (mg/kg)
- 1.0 – 5.0 ppm (mg/kg)
- 5.0 – 10 ppm (mg/kg)
- 10 – 50 ppm (mg/kg)
- > 50 ppm (mg/kg)

NOTES:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN," TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWINGS PROVIDED BY GMPTG ENGINEERING DEPT., TONWANDA, NY, DATE: 3/99 AND THE IT CORPORATION, GRAND ISLAND, NY, DATE: 8/00.
3. ALL DIMENSIONS ARE APPROXIMATE.
4. FIELD SCREENING RESULTS ARE 4' TO 8' IN DEPTH UNLESS NOTED IN PARENTHESES.

№	Revision	Date	Initial

Approved

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

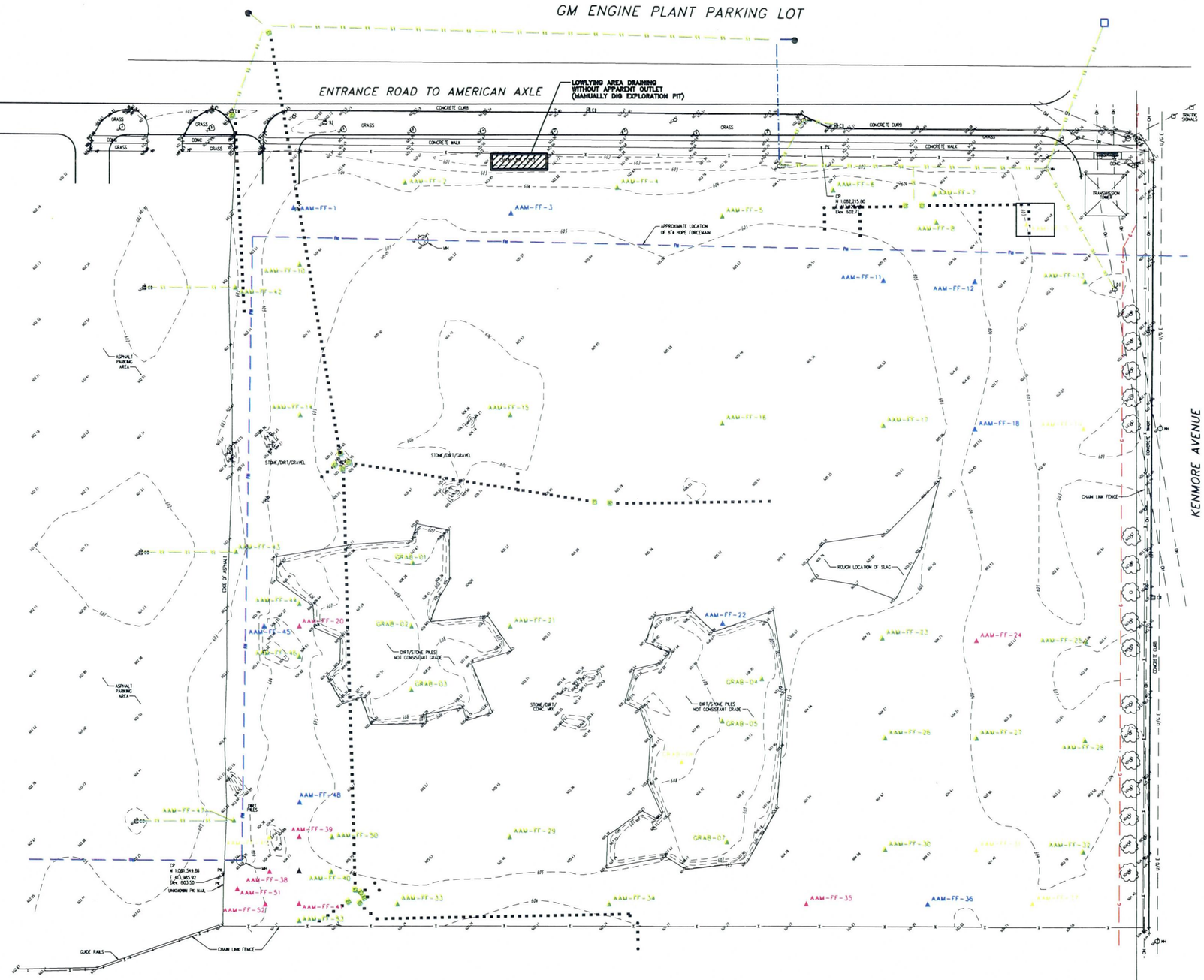
RAILROAD DRAINAGE LINE INVESTIGATION

FIELD SCREENING RESULTS (4-12 FT)

CRA CONESTOGA-ROVERS & ASSOCIATES

Drawn by:	Scale:	Date:	File №:	Rev.№:
JF	AS SHOWN	NOVEMBER 2000	GN-004	1
Designed by: JLL				
Checked by: JLL	Field book:	Project №: 17056-12	Drawing №: 4A	

17056-12(011)NOV 06/2000



LEGEND

- PCB CONCENTRATION <1 ppm
- PCB CONCENTRATION 1–10 ppm
- PCB CONCENTRATION 10–25 ppm
- PCB CONCENTRATION 25–50 ppm
- PCB CONCENTRATION >50 ppm
- EMCON PCB CONCENTRATION <1 ppm
- EMCON PCB CONCENTRATION 1–5 ppm
- EMCON PCB CONCENTRATION 5–10 ppm
- EMCON PCB CONCENTRATION 10–50 ppm
- EMCON PCB CONCENTRATION >50 ppm
- EXISTING BULKHEAD
- EXISTING STORM SEWER LINE NOT IN USE
- EXISTING FORCE MAIN
- EXISTING GAS LINE
- EXISTING STORM SEWER LINE
- EXISTING GUIDE RAIL
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD WIRES OR CABLES
- EXISTING CONTOUR LINE
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING POWER POLE
- EXISTING DRAIN INLET
- EXISTING SIGN
- EXISTING METAL POST
- EXISTING LIGHT POLE
- EXISTING SURVEY CONTROL POINT

ABBREVIATIONS

- CONC CONCRETE
- ppm PARTS PER MILLION
- PCB POLYCHLORINATED BIPHENYLS

0 40 80 160

APPROXIMATE SCALE IN FEET

GENERAL MOTORS CORPORATION
AMERICAN AXLE & MANUFACTURING, INC.
TONAWANDA FORGE PLANT

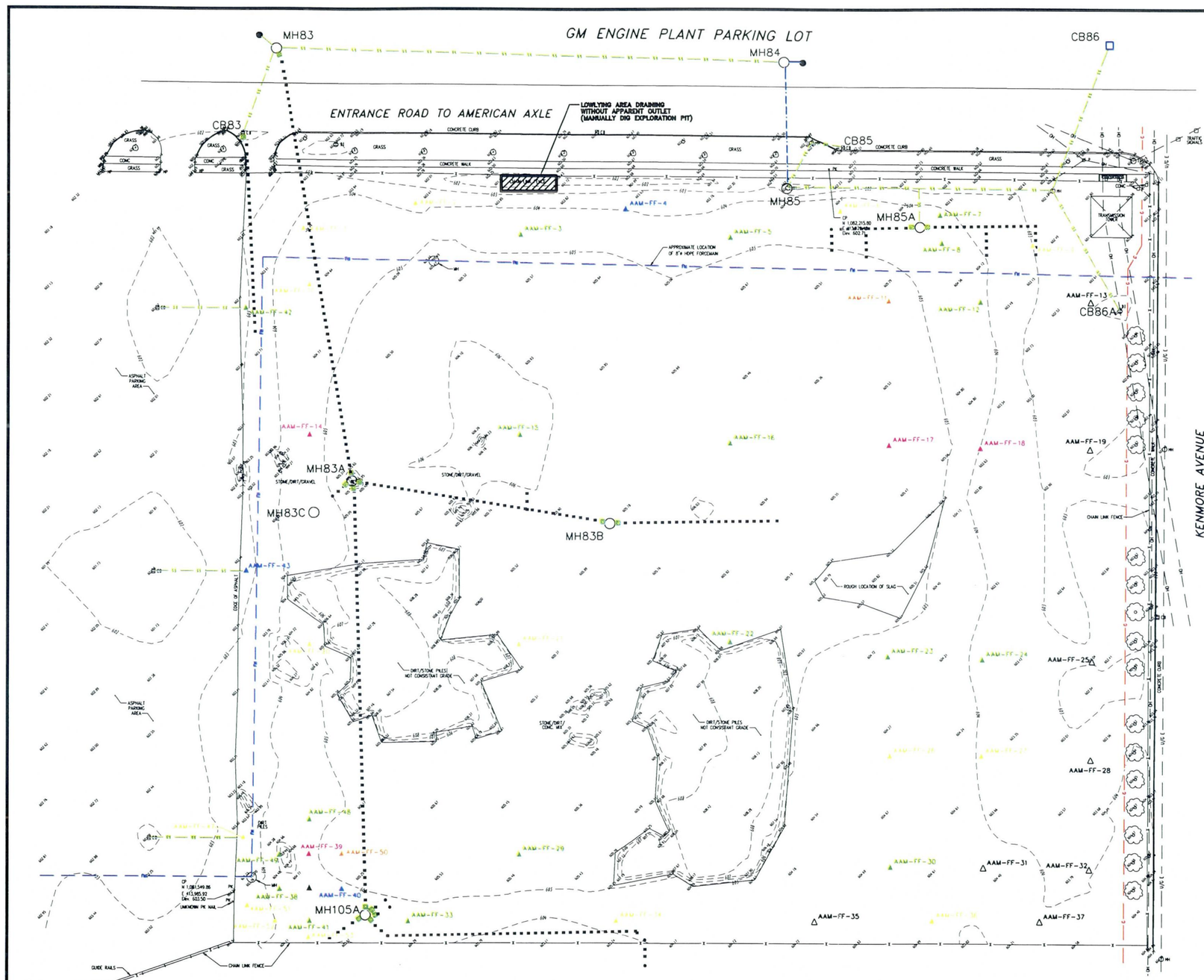
INTERIM CORRECTIVE MEASURES REPORT – ADDENDUM III

FRONT FORTY SOIL SAMPLING RESULTS (0-2 FEET)

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 4

X: NONE
P: DL, DL2B
4/30/01 BCO-54 MJS
10/01/01 SYR-54-KMD
86977001\85977B04.DWG



LEGEND

- CLAY ENCOUNTERED THEREFORE DEPTH INTERVAL NOT FIELD SCREENED
- PCB CONCENTRATION <1 ppm
- PCB CONCENTRATION 1–10 ppm
- PCB CONCENTRATION 10–25 ppm
- PCB CONCENTRATION 25–50 ppm
- PCB CONCENTRATION >50 ppm
- EXISTING BULKHEAD
- EXISTING STORM SEWER LINE NOT IN USE
- EXISTING FORCE MAIN
- EXISTING GAS LINE
- EXISTING STORM SEWER LINE
- EXISTING GUIDE RAIL
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD WIRES OR CABLES
- EXISTING CONTOUR LINE
- EXISTING MANHOLE
- EXISTING CATCH BASIN
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- EXISTING LIGHT POLE
- EXISTING SURVEY CONTROL POINT

ABBREVIATIONS

- CONC CONCRETE
- ppm PARTS PER MILLION
- PCB POLYCHLORINATED BIPHENYLS

0 40 80 160

APPROXIMATE SCALE IN FEET

GENERAL MOTORS CORPORATION
AMERICAN AXLE & MANUFACTURING, INC.
TONAWANDA FORGE PLANT

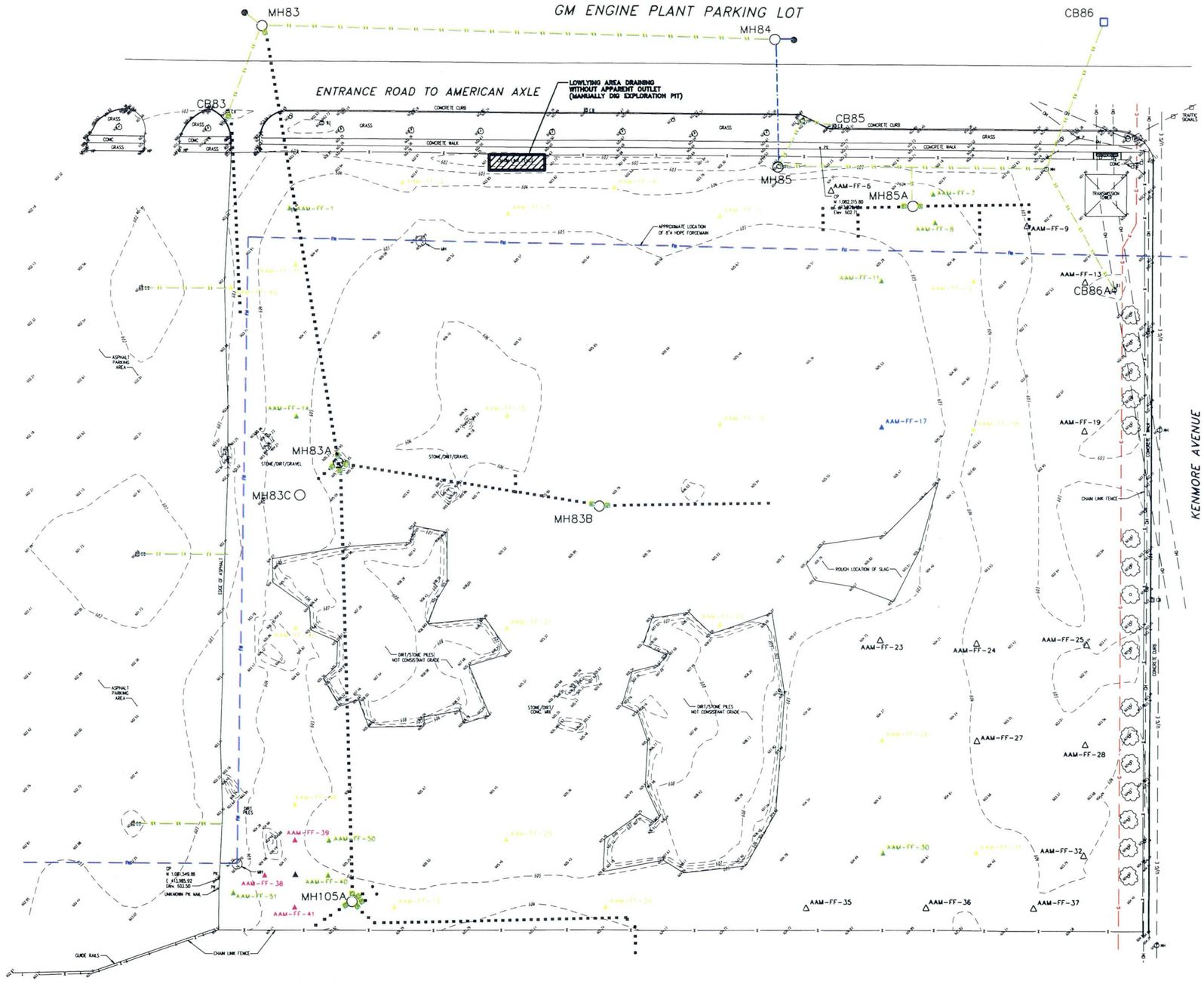
INTERIM CORRECTIVE MEASURES REPORT – ADDENDUM III

FRONT FORTY SOIL SAMPLING RESULTS (2-4 FEET)

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 5

X: NONE
P: DL, DL2B
10/01/01 SYR-54-KMD
4/30/01 BOCO-54 MJS
86977001\86977B05.DWG



LEGEND

- △ CLAY ENCOUNTERED THEREFORE DEPTH INTERVAL NOT FIELD SCREENED
- PCB CONCENTRATION <1 ppm
- PCB CONCENTRATION 1–10 ppm
- PCB CONCENTRATION 10–25 ppm
- PCB CONCENTRATION 25–50 ppm
- PCB CONCENTRATION >50 ppm
- EXISTING BULKHEAD
- EXISTING STORM SEWER LINE NOT IN USE
- EXISTING FORCE MAIN
- EXISTING GAS LINE
- EXISTING STORM SEWER LINE
- EXISTING GUIDE RAIL
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD WIRES OR CABLES
- EXISTING CONTOUR LINE
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING POWER POLE
- EXISTING DRAIN INLET
- EXISTING SIGN
- EXISTING METAL POST
- EXISTING LIGHT POLE
- EXISTING SURVEY CONTROL POINT

ABBREVIATIONS

- conc CONCRETE
- ppm PARTS PER MILLION
- PCB POLYCHLORINATED BIPHENYLS

0 40 80 160

APPROXIMATE SCALE IN FEET

X: NONE
P: DL, DL2B
5/1/01 BCO-54 MJS
10/01/01 SYR-54-KMD
86977001\86977B06.DWG

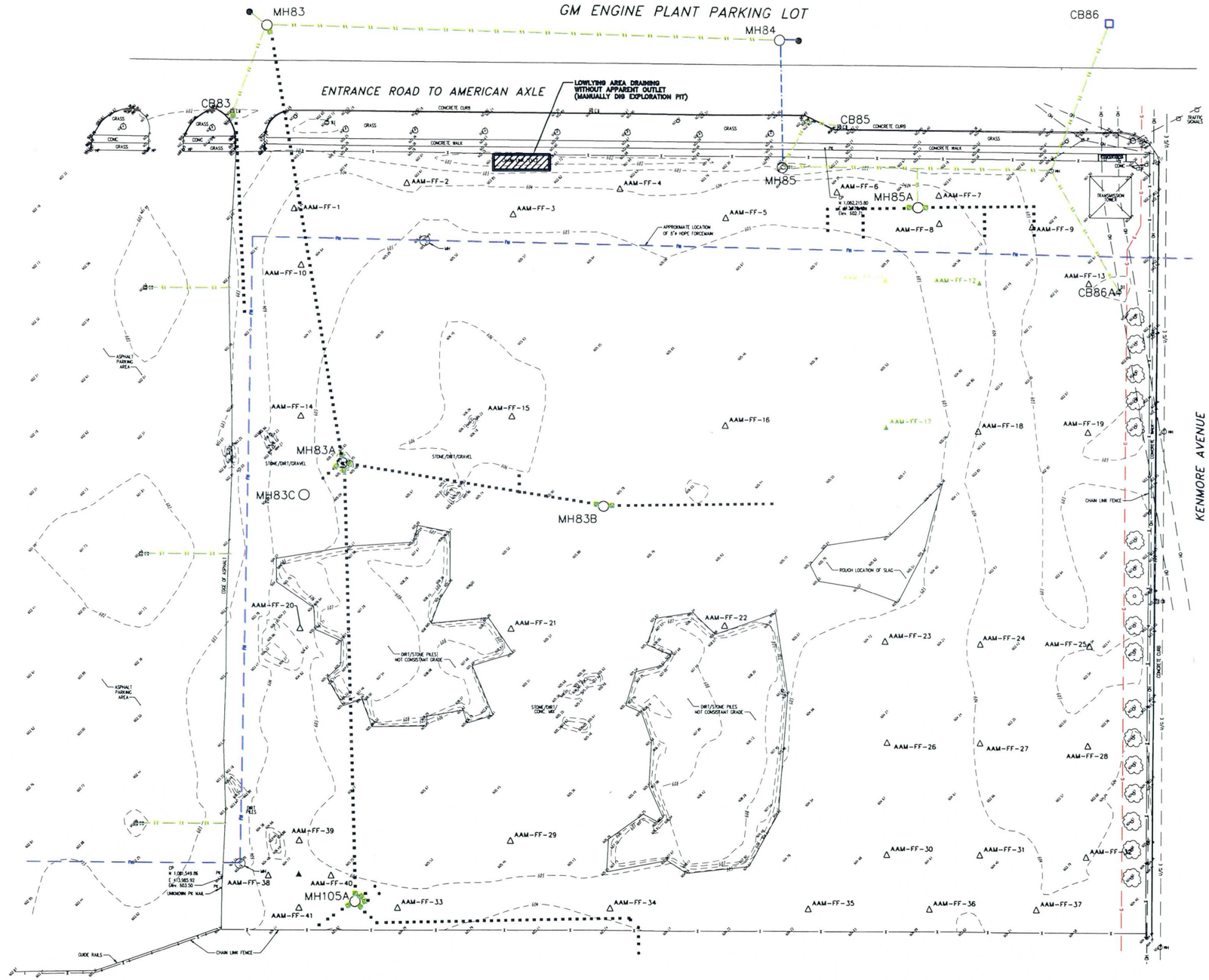
GENERAL MOTORS CORPORATION
AMERICAN AXLE & MANUFACTURING, INC.
TONAWANDA FORGE PLANT

INTERIM CORRECTIVE MEASURES REPORT – ADDENDUM III

FRONT FORTY
SOIL SAMPLING RESULTS
(4-6 FEET)

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 6



LEGEND

- CLAY ENCOUNTERED THEREFORE DEPTH INTERVAL NOT FIELD SCREENED
- PCB CONCENTRATION <1 ppm
- PCB CONCENTRATION 1–10 ppm
- PCB CONCENTRATION 10–25 ppm
- PCB CONCENTRATION 25–50 ppm
- PCB CONCENTRATION >50 ppm
- EXISTING BULKHEAD
- EXISTING STORM SEWER LINE NOT IN USE
- EXISTING FORCE MAIN
- EXISTING GAS LINE
- EXISTING STORM SEWER LINE
- EXISTING GUIDE RAIL
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- EXISTING POWER POLE
- EXISTING DRAIN INLET
- EXISTING SIGN
- EXISTING METAL POST
- EXISTING LIGHT POLE
- EXISTING SURVEY CONTROL POINT

ABBREVIATIONS

conc CONCRETE
ppm PARTS PER MILLION
PCB POLYCHLORINATED BIPHENYLS

0 40 80 160

APPROXIMATE SCALE IN FEET

GENERAL MOTORS CORPORATION
AMERICAN AXLE & MANUFACTURING, INC.
TONAWANDA FORGE PLANT

INTERIM CORRECTIVE MEASURES REPORT – ADDENDUM III

FRONT FORTY SOIL SAMPLING RESULTS (6-8 FEET)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 7

X: NONE
P: DL, DL2B
10/01/01 SYR-54-KMD
5/1/01 BOCO-54 MJS
86977001\86977B07.DWG