March 24, 2016 Reference No. 080987-30

Mr. Daniel J. Eaton
New York State Department of Environmental Conservation
625 Broadway
Albany, New York
U.S.A. 12233-7015

Dear Sir:

Re: Preliminary Remedial Design Report
Friedrichsohn Cooperage Site, 153-155 Saratoga Avenue, Waterford, New York

On behalf of SI Group Inc. and the General Electric Company (Companies), we have enclosed the Preliminary Remedial Design Report for OU-1 and OU-3 for New York State Department of Environmental Conservation (NYSDEC) review and approval.

The Preliminary Remedial Design Report is being submitted in electronic (PDF) format and hard copies.

Should you have any questions or require additional information or clarification, please do not hesitate to contact the undersigned.

Sincerely,

GHD

Jamie Puskas, P.Eng.

JP/kf/11

Encl.

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REGISTERED COMPANY FOR ISO 9001 ENGINEERING DESIGN

Preliminary Remedial Design Report

Friedrichsohn Cooperage Site
153 155 Saratoga Avenue
Town of Waterford, New York

General Electric Company and SI Group, Inc.

651 Colby Drive Waterloo Ontario N2V 1C2
080987 | Report No 7 | March 24 2016

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1. Introduction

The Friedrichsohn Cooperage inactive hazardous waste site (the Site) is located at 153-155 Saratoga Avenue in the Town of Waterford, New York (see Figure 1.1 for the Site location). The Site is comprised of three Operable Units (OUs). OU-1 is comprised of the on-Site and off-Site contaminated soils associated with the former cooperage operation. OU-2 is comprised of the on-Site and off-Site groundwater. OU-3 is comprised primarily of the sediments in the Old Champlain Canal (Canal) between O'Connor Drive and Burton Avenue, and also includes on-Site source area soils.

On behalf of General Electric Company and SI Group, Inc. (the Companies), GHD prepared and submitted to New York State Department of Environmental Conservation (NYSDEC) a Remedial Design/Remedial Action Work Plan dated July 9, 2013 for OU-1 and the Upland Source Soils in OU-3 (Uplands Work Plan) and a Remedial Design/Remedial Action Work Plan dated July 22, 2014 for OU-3 Sediment (Sediment Work Plan; collectively "Work Plans"). The Work Plans provided for the development and implementation of final plans and specifications for implementing the remedial alternative for OU-1 on-Site soils, the Upland Source Soils in OU-3, and OU-3 sediments. The Work Plans also presented a pre-design investigation program aimed at collecting the additional data necessary to complete the remedial design. The pre-design data collected in accordance with the NYSDEC approved Work Plans was presented in the Pre-Design Investigation Report for Upland Source Soils for OU-3 (CRA, January 27, 2015) and the Pre-Design Investigation Report for OU-3 Sediments (CRA, April 10, 2015) and is summarized in this Preliminary Remedial Design (PRD) Report.

OU-2 on-Site groundwater is undergoing monitoring in accordance with the NYSDEC approved Groundwater Monitoring Plan dated July 2015.

This PRD Report has been prepared by GHD in accordance with the NYSDEC approved Work Plans and the Order on Consent (Consent Order) between the NYSDEC and the Companies, which became effective February 7, 2013 (Index No. A5-0784-1202).

The PRD Report is organized as follows:

Section 1.0 – Introduction

Section 2.0 – Background Information

Section 3.0 – Pre-design Investigation Soil

Section 4.0 – Pre-design Investigation - Sediments

Section 4.0 – Remedial Action Design Criteria

Section 5.0 – Remedial Action Summary

Section 6.0 – Engineering Design

Section 7.0 – Construction Quality Assurance

Section 8.0 – Project Plans

Section 9.0 – Permits and Approvals

Section 10.0 – Remedial Design Schedule

2. Background Information

2.1 Site Location and Description

The Site is located at 153-155 Saratoga Avenue, Waterford, Saratoga County, New York. A Site Plan is presented as Figure 2.1. The Site, currently a vacant lot, is approximately 0.45 acres in size and has approximately 315 feet of frontage on Saratoga Avenue (Route 32). The Old Champlain Canal borders the Site on the side opposite the road. Residential properties are adjacent to the Site on Saratoga Avenue; residential and commercial properties are also located across from the Site on Saratoga Avenue. The approximate boundaries of the Site are shown on Figure 2.1.

Access to the Site is limited by an 8 foot tall, lockable, chain-link fence that has been installed around the former Friedrichsohn Cooperage property. Warning signs have been placed on the fencing.

The Site is currently zoned as residential (R-75). The commercial properties across from the Site are located on property formerly known as the Friedrichsohn Cooperage Lot, which was used to store drums.

2.2 Old Champlain Canal

The Champlain Canal was first considered in 1792 as a means of creating a waterway between Lake Champlain and the Hudson River. Construction of the Canal commenced in 1817 at the northern end and progressed southward with the southern section at Waterford completed in 1822

The Champlain Canal (now referred to as the Old Champlain Canal or OCC) within the Town and Village of Waterford runs from the Mohawk River northeast past the Site and intersects the Erie Canal between locks E2 and E3. The northern section of the OCC continues past the Erie Canal through the Village of Waterford to a wetland area. The Canal is listed on the National Historic Registry. Within the southern leg of the OCC is former OCC lock 4 which is no longer used and a tumbler gate at the confluence of the OCC and the Erie Canal. Former OCC lock 4 and the tumbler gate are not within the sediment removal work limits. These structures are monitored by the New York State Canal Corporation (NYSCC).

The water level in the OCC and the section of the Erie Canal between locks E2 and E3 is controlled by a spillway weir adjacent to Erie Canal lock E2. The NYSCC operates the Erie Canal locks during the Navigation Season from early May to mid-November each year. The operation of the locks temporarily influences the water levels in the OCC and Erie Canal as water is used to fill lock E2 or water is discharged from lock E3. During the non-navigation season from mid-November to the end of April, the OCC can be drained by the NYSCC.

2.3 Site History

A cooperage operated at this location from 1817 to 1991. During early operations the cooperage made and refurbished wooden kegs and barrels. When the cooperage closed in 1991 the primary business had been cleaning and refurbishing metal drums. Industrial facilities in the area used

materials shipped in drums in their industrial processes. Drums would be sent to the cooperage to be cleaned, repainted, and resold. The drum cleaning and refurbishing operations are alleged to be the source of the contamination that was identified at the Site.

During its most recent history, the cooperage operated out of five buildings at the Site. Three of the five buildings were constructed as slab-on-grade. Two of the buildings contained structures below grade. One of the buildings had a basement area, below grade, where sumps were located. One of the buildings on the southwest end of the Site is labeled as a garage on historical drawings, and had an automobile service trench associated with it. The service trench is below grade and provided access to the undercarriage of vehicles.

Inspection and examination of the abandoned business in 1994 revealed many metal drums, and the buildings to be unstable and in poor condition. The United States Environmental Protection Agency (U.S. EPA) conducted an emergency removal action between 1994 and 1996. The cooperage buildings were demolished, and clean fill was imported to replace contaminated soil that was removed. In the spring of 2008, NYSDEC collected samples of soil, groundwater, and surface water and sediment in the Canal. The analytical results formed the basis for the listing of the Site in December 2008 as a Class 2 Site on the NYS Registry of Inactive Hazardous Waste Disposal Sites.

The Site is listed on the State Historical Registry (Site No. 091-18-0032D02). The OCC is listed on the National Historical Registry (Site No. 76001274).

The Site and the related section of OCC is currently divided into three OUs:

- OU-1 is comprised of the on-Site and off-Site soil at the former cooperate site, excluding the soil in the on-Site source area adjacent to the Canal that is part of OU-3.
- OU-2 is comprised of on-Site and off-Site groundwater.
- OU-3 is comprised of the sediments in the Old Champlain Canal between O'Connor Drive and Burton Avenue, as well as the adjacent on-Site source area and Canal bank soil.

The contaminants of concern (COCs) at the Site include polychlorinated biphenyls (PCBs), chlorinated volatile organic compounds (VOCs) (tetrachloroethane, trichloroethane, dichloroethene, vinyl chloride, and chlorobenzene), benzene, toluene, ethylbenzene, xylenes (BTEX), phenolic compounds (phenol and dimethylphenol), hexachlorobenzene, and metals (arsenic, barium, chrome, and lead).

NYSDEC issued a Record of Decision (ROD) for OU-3 in March 2011 and a ROD for OU-1 in December 2012. In the OU-1 ROD, NYSDEC selected a Site Cover remedy to achieve restricted residential soil cleanup objective (SCOs). In addition to the Site cover component, the remedy also included Institutional Controls. In the OU-3 ROD, the remedy pertinent to the on-Site source area included excavating the source soil down to bedrock and transporting the material off-Site for disposal. The areas identified for remediation in the ROD are shown on Figure 2.1.

The components of the remedy for OU-1 and OU-3 soils as specified in the RODs are as follows:

- A remedial design program to provide the details necessary to implement the remedial program.
- Construction of a Site cover to allow for restricted residential use of the Site, including any soil excavation to make room for the full thickness of the Site cover.

- Excavation of on-Site source soils down to bedrock.
- Off-Site transport and disposal of excavated soils to a permitted disposal facility.
- Development of a Site management plan to address residual contamination and any use restrictions.
- Imposition of an environmental easement.
- Annual certification of the institutional and engineering controls.

In the OU-3 ROD, the remedy pertinent to OU-3 sediment, as specified in the ROD is as follows:

- Address contamination of sediment of the Old Champlain Canal from O'Connor Drive in the south to Burton Avenue north of the Site, with the horizontal and vertical extent to be refined by sampling during the design.
- PCBs have been identified by NYSDEC as the marker compound for the canal sediments. The remedial objective is removal of sediment within OU-3 for off-Site disposal to achieve a cleanup goal of 1 parts per million (ppm), consistent with verification sampling procedures established as part of the remedial design process.
- Excavation of an estimated 12,500 cubic yards of sediment from the Canal within the boundary of OU-3 to a depth of approximately two feet below the existing top of sediment. Where necessary, excavated sediments in the Canal will be replaced with clean fill to establish the original design water depth of six feet in the Canal.
- Off-Site transport and disposal of excavated sediments (including sediments with PCBs above 50 ppm) will be to a permitted disposal facility.
- Restored canal bed will meet the New York State Canal Corporation (NYSCC) requirements.
- Design will contain elements to stabilize excavations, control water in the excavation, control odors, and dewater the excavated materials. In areas where the excavation does not end in bedrock, the design will also require confirmation sediment/soil sampling to verify the extent of contamination has been removed.

In January 2013, the Companies and NYSDEC entered into a Consent Order to conduct and implement the selected remedies as set forth in the NYSDEC RODs, dated March 2011 and December 2012.

2.4 Site Hydrogeology

The Site geology and hydrogeology is described in the Focused Remedial Investigation Feasibility Study (RI/FS) prepared by Malcolm Pirnie, Inc. and dated April 2010.

The overburden generally consists of brown medium sandy fine gravel overlain by silty sand. The bedrock in the area of the Site consists of Canajoharie shale. The depth to bedrock varies and ranges from approximately 10 to 25 feet below ground surface (bgs) on the northern side of the Site to 30 to 35 feet bgs on the southern side of the Canal. A cross-section along the north side of the OU-3 Upland Source Soils area is presented in Figure 2.2.

The ground surface elevation ranges from 55 feet North American Vertical Datum of 1988 (NAVD 88) to 50 feet NAVD 88 along the top of the Canal bank. Groundwater elevations have been observed to be between approximately 44.5 to 46.5 feet NAVD 88.

The water level in the Old Champlain Canal has been found to be at a similar elevation to the adjacent shallow groundwater. Fluctuations in the Canal water levels likely influence the magnitude and direction of the shallow groundwater flow in its vicinity.

Based on groundwater level measurements from the existing bedrock monitoring well network, bedrock groundwater flow is to the south/southeast towards the Mohawk River.

Movement of water in the Old Champlain Canal is dependent on the operation of nearby locks, which are controlled by the NYSCC. During the navigational season (approximately May to November) the water in the Old Champlain Canal is constantly in flux. The water level in the canal rises and falls and flows northeast or southwest depending on if the NYSCC has opened or closed nearby locks. The water level in the Old Champlain Canal rises and falls by a foot or more multiple times each day during the navigational season. During the non-navigational season (approximately November to April) the NYSCC typically drains the Old Champlain Canal of water.

3. Pre-design Investigation – OU-1 and OU-3 Soils

Pre-design investigation activities required to complete this PRD Report for soil remediation in OU-1 and the OU-3 upland source soils area, as outlined in Section 5.0 of the Remedial Design/Remedial Action (RD/RA) Work Plan (Work Plan) (CRA, 2014), were conducted from May to June 2014. These activities included:

- Complete the characterization of PCBs between the existing OU-3 upland source soils area sampling and the Canal top-of-bank. This area includes some of the soil located within the OU-3 area. For discussion purposes in this document, references herein to upland source area includes impacted soils located between the Canal bank and northern limit of OU-3 soils (OU-3 Source Soils).
- Collect geotechnical data for the overburden and bedrock to allow for the design of a shoring plan for the OU-3 soils area excavation activities.
- Estimate groundwater flow from the overburden and bedrock aquifers to develop estimates of the amount of water that will require management during excavation activities below the water table.
- Obtain representative groundwater samples from the OU-3 Source Soils area to evaluate the quality of groundwater that will require management during dewatering activities.
- Characterize soil for disposal purposes.

The following subsections summarize the pre-design investigations listed above and corresponding results that were used to complete the remedial design presented in this PRD Report.

3.1 Characterization of PCBs within OU-3 Source Area

Soil within the OU-3 Source Soils area are to be excavated down to bedrock, which is approximately 16 feet below surface elevation and will include the excavation of approximately 2,800 cubic yards of soil. Furthermore, PCB soil sampling was conducted as part of the pre-design investigation to not only delineate the extent of PCB contamination, but also determine the volume of soil with PCB concentrations equal to or above 50 milligram per kilogram (mg/kg), which will ultimately require management as a Toxic Substance Control Act (TSCA) waste. TSCA requires

disposal of soil containing PCBs at concentrations greater than or equal to 50 ppm in a hazardous waste landfill, pursuant to Section 3004 of the Resource Conservation and Recovery Act (RCRA), or by a State authorized under Section 3006 of RCRA or a PCB disposal facility approved under TSCA. Four locations were initially identified within the OU-3 Area which contained PCBs greater than or equal to 50 mg/kg. Under Section 3004 of the RCRA, soil found at these locations will require disposal at a hazardous waste landfill, a State authorized facility under Section 3006 of RCRA, or a PCB disposal facility approved under TSCA consistent with 40 CFR 761.61 of TSCA. To further define the boundary of soils containing a PCB concentration greater than or equal to 50 mg/kg, additional soil sampling was proposed within the Work Plan.

As presented in Section 5.2 of the Work Plan, an approximate 25-foot wide gap in historic data was identified between the southernmost PCB sampling and the sediment sampling completed along the northern bank of the Canal. According to 40 CFR 761.61 of the TSCA, Subpart N requires characterization sampling prior to conducting PCB removals. The spacing of the existing grid sampling in the OU-1 upland source area is consistent with Subpart N; however, there were gaps between SPB-8, SPB-9 and SPB-10 along the northern Canal bank. As a result, additional soil sampling was proposed in this area.

3.1.1 PCB Field Investigation Summary

A total of 26 soil borings were completed by CRA in May 2014 to further delineate, both vertically and horizontally, the presence of PCB concentrations greater than or equal to 50 mg/kg in the OU-1 upland source area. A total of 26 borings were advanced by Aquifer Drilling & Testing, Inc (ADT) using a track mounted Geoprobe: Six borings were advanced to a depth of approximately 5 feet below ground surface (bgs), eight borings to a depth of approximately 9 to 10 feet bgs and twelve borings to a depth of approximately 15 feet bgs. Figure 3.1 identifies the associated 2014 boring locations. Boring logs are presented in Appendix A of the OU3 Upland Source Soils Pre Design Investigation Report.

Soil samples were collected at various depths consistent with the procedures described in the Field Sampling Plan (FSP) presented in Appendix D of the Work Plan. All soil samples were submitted to Spectrum Analytical Inc. for PCB analysis and complied with the procedures defined in the Quality Assurance Project Plan (QAPP) presented in Appendix C of the Work Plan. In accordance with the Work Plan, various samples were held in the laboratory pending receipt of soil samples collected from shallower depths or from boreholes within close proximity to locations known to contain PCB concentrations greater than or equal to 50 mg/kg. The laboratory was directed to analyze the withheld samples if delineation of greater than or equal to 50 mg/kg PCBs was not achieved in the shallow or adjacent sample. Soil analytical data reports from Spectrum Analytical Inc. are provided in Appendix B of the OU3 Upland Source Soil Pre Design Investigation Report and the results are summarized within Table 3.1. All soil borings were surveyed on May 22, 2014 and survey information is included with the boring logs.

3.1.2 PCB Soil Sampling Results

Soil results from the pre design investigation were reviewed and compiled with the historical sampling results. Historical sampling results, along with the pre design investigation results for borings conducted within the OU-3 Source Soils area, are provided in Table 3.1 and are also presented on Figure 3.1,. Proposed excavation limits based on results with soil concentrations greater than or equal to 50 mg/kg are also included in Figure 3.1, as previously presented in the

OU-3 Upland Source Soil Pre Design Report. The proposed limits extend approximately halfway between sample locations where PCBs were greater than or equal to 50 mg/kg and a sample location where PCBs were less than 50 mg/kg. Three proposed excavation areas of approximately 131 feet^2 for Area 1, 69 feet^2 for Area 2, and 965 feet^2 for Area 3 are identified on Figure 3.1 as containing PCBs greater than or equal to 50 mg/kg requiring TSCA disposal. Additional field sampling during excavation will be required to confirm horizontal and vertical removal of PCBs greater than or equal to 50 mg/kg so that this material is staged properly for disposal.

Excavation limits for soils containing PCBs ≥50 mg/kg are based on the following sampling data:

AREA 1:

- SB-31 sample depth 5 to 6 feet bgs – 110 mg/kg PCBs – 2010
- SB-31a sample depth 4 to 5 feet bgs – ND(0.038) mg/kg PCBs – 2014
- SB-31a sample depth 7 to 8 feet bgs – 5.7 mg/kg - 2014

Therefore, all soils in Area 1 between 5 and 7 feet bgs would be removed and staged as a TSCA waste.

The horizontal extent of PCB concentrations greater than or equal to 50 mg/kg in Area 1 is delineated by soil borings surrounding SB-31 and SB-31a.

AREA 2:

- SB-76 sample depth 4 to 5 feet bgs – 72 mg/kg PCBs –2010
- SB-76 a sample depth 3 to 4 feet bgs – ND(0.038) mg/kg PCBs – 2014
- SB-76a sample depth 7 to 8 feet bgs – 0.95 mg/kg PCBs – 2014

Therefore, all soils in Area 2 between 4 and 7 feet bgs would be removed and staged as a TSCA waste.

The horizontal extent of PCB concentrations greater than or equal to 50 mg/kg in Area 2 is delineated by soil borings surrounding SB-76.

AREA 3:

- SB-74 sample depth 7 to 8 feet bgs – 1,000 mg/kg PCBs - December 2010
- SPB-9 sample depth 3 to 4 feet bgs – 230 mg/kg PCBs – February 2011
- SPB-9a sample depth 1 to 2 feet bgs – 1,600 mg/kg PCBs – May 2014
- SB-99a sample depth 1 to 6 feet bgs – 130 mg/kg PCBs – May 2014

These locations are all contained either by the Canal boundary or by samples with PCBs less than 50 mg/kg. The horizontal extent of Area 3 greater than or equal to 50 mg/kg PCBs is defined by soil boring locations surrounding SB-74, SPB-9, SPB-9a and SB-99a. The extent of Area 3 that is greater than or equal to 50 mg/kg PCBs is presented on Figure 3.1. The southern excavation limit for Area 3 is defined by the NYSCC boundary line.

The presence of PCBs greater than or equal to 50 mg/kg has been defined vertically between 1 and 10 feet bgs in Area 3. All soils removed from this depth interval would be staged as a TSCA waste.

Sampling will be performed during excavation to confirm that soil with PCBs greater than or equal to 50 mg/kg has been removed in locations where the vertical limits were not identified during pre-design investigation sampling. These intervals are noted in the design drawings. In addition, side wall sampling will be performed in each sub area after each 2 foot cut to verify that PCBs greater than or equal to 50 mg/kg have been removed. Stockpile testing will confirm final disposal characteristics.

3.2 Geotechnical Soil Borings

The northern edge of the OU-3 Source Soils area is within close proximity to Saratoga Avenue and the sidewalk. With an anticipated excavation depth of approximately 16 feet, the excavation must be shored in order to maintain the road and sidewalk throughout the remedial work. Similarly, the southern edge of the OU-31 Source Soils area is adjacent to the Canal and shoring, or another method of isolation, will be required along the entire boundary of the OU-3 soils area excavation in order to isolate the OU3 and OU1 areas during the phased removal of TSCA and non-TSCA materials. The additional geotechnical data requirements specified in the OU1 Work Plan (obtained during pre-design investigations) were required to develop design criteria for any shoring necessary for the OU-3 Source Soils area excavation.

Two geotechnical borings (GB-01 and GB-02) were advanced by ADT using a truck-mounted drill rig and hollow stem augers (HSA). The borehole locations are shown on Figure 3.2. Each boring was advanced approximately 12-16 feet into the overburden and then approximately 15 feet further into the sedimentary bedrock using an HQ sized core barrel. The associated stratigraphy information and sample intervals were recorded for each boring by a CRA field geologist. CRA collected a total of six overburden samples; three samples were located above the water table and three from below the water table. Following collection, the samples were submitted to Inspec-Sol located in Waterloo, Ontario for grain size analysis (ASTM422), water content (ASTM D2216), unit weight determination (ASTM D653) and specific gravity (ASTM D584) assessments. Additionally, four bedrock samples were collected from each boring and submitted to Inspec-Sol for point load testing and unconfined compression testing.

The results of the geotechnical analyses are presented in Appendix D of the OU3 Upland Source Soil Pre Design Investigation Report and the boring stratigraphy logs are provided in Appendix A of the OU-1 Upland Source Soil Pre Design Investigation Report. The geotechnical results have been utilized to calculate the lateral pressures on the shoring system as summarized in Table 3.2. The remedial contractor will be responsible for the design of the shoring system.

3.3 In-Situ Hydraulic Conductivity Testing

The purpose of in-situ hydraulic conductivity testing was to estimate groundwater dewatering requirements during excavation activities.

The hydraulic conductivity testing activities included performing single-well response (slug) tests at selected overburden wells to determine the hydraulic conductivity in the overburden. The bedrock will inherently contribute water to the OU-3 Source Soils area excavation. A packer injection test was performed on two geotechnical boreholes in the OU-3 Source Soils area to estimate the hydraulic conductivity of the bedrock.

Furthermore, pressure transducers and data loggers were installed in the two new overburden monitoring wells MW-14 and MW-15 and in the Canal adjacent to the two monitoring wells. Canal

and groundwater level data were collected for a period of two weeks to evaluate the potential hydraulic connectivity between the groundwater and the Canal.

3.3.1 Slug Test Results

GHD completed slug tests on three overburden wells (MW-8, MW-10, and MW-15) and two bedrock monitoring wells (MW-1S and MW-6S) from May 8 to June 16, 2014. The falling/rising head slug test results are presented in Appendix F of the OU-1 Upland Soil Pre Design Investigation Report. The slug test results are summarized in Table 3.3. The average calculated hydraulic conductivity for the overburden was 1.3 x 10-3 cm/sec. Based on the slug test results and the expected groundwater elevation relative to the depth of the excavation, dewatering requirements for the overburden were calculated to be approximately 10 gallons per minute (gpm) after the initial drawdown. The short term dewatering requirement will be higher to lower the water table down in stages and will vary depending on the size of the area undergoing dewatering.

3.3.2 Pressure-Injection Test Results

The pressure-injection test results for the two bedrock boreholes are presented in Appendix E of the Pre- Design Investigation Report for OU-3 (Upland Source Area).

The table below provides the hydraulic conductivity calculated from the pressure-injection testing:

Monitoring Well	Hydraulic Conductivity (cm/sec)
GB-01	1.2×10^{-5}
GB-02	1.3×10^{-5}

The packer injection testing results have been utilized to calculate the hydraulic properties in the sedimentary bedrock to determine the contribution of water from bedrock. The contribution from the bedrock is expected to be negligible.

3.3.3 Canal and OU-1 Groundwater Elevation Connectivity Results

The continuous groundwater elevations in the two monitoring wells (MW-14 and MW-15) and the surface water elevations in the canal adjacent to the monitoring wells are presented in Figure 3.3. Changes in elevation of the surface water in the Canal did not result in a change in groundwater elevation during the monitoring period. The results indicate minimal hydraulic connectivity between the Canal and the overburden groundwater at monitoring wells MW-14 and MW-15. However, some leakage of water through the excavation shoring along the southern extent of the excavation is likely. A lower surface water level in the Canal will reduce potential water leakage to the excavation during soil removal activities however the Contractor will be required to implement a water management plan and have sufficient pumping capacity available to deal with water entering the excavation and work areas during the remediation.

Regular day time fluctuations in OCC water levels were recorded and are potentially related to the operation of Erie Canal locks E2 and E3. Additional investigation into the water balance between the OCC and the Erie Canal is required to understand the implications of installing cofferdams in the OCC during the navigation season to allow sediment removal to be conducted under dewatered conditions. A hydraulic analysis will be performed as presented in Section 6.14.

3.3.4 Groundwater Elevations – June/July 2014

As shown on Figure 3.3, water levels in the two new OU-3 Source Soils area monitoring wells MW-14 and MW-15 varied from 44.5 to 45 feet NAVD 88 with the exception of a spike after a significant rain event. These are consistent with data from the RI/FS.

3.4 Monitoring Well Installation/Groundwater Sampling

There were two existing groundwater monitoring wells located in the OU-3 Source Soils area: MW-09 (bedrock) and MW-10 (overburden). In addition, there is a piezometer (PES-1) located in the OU-1 upland source area and within close proximity to the groundwater monitoring wells. Monitoring well MW-09 was not located during the pre-design investigation and is believed to have been destroyed. In order to further evaluate groundwater quality in the OU-3 Source Soils area, two new groundwater monitoring wells were installed. Monitoring well MW-14 was installed adjacent to the shoreline to provide a better indication of the groundwater quality at the down gradient end of the source area. Monitoring well MW-15 was installed on the eastern perimeter of the OU-3 Source Soils area. The purpose of monitoring well MW-15 was to obtain representative groundwater samples from the OU-3 Source Soils area, to further evaluate the groundwater quality that will require management during dewatering activities and evaluate the effect of the OU-3 Source Soils on groundwater quality. All monitoring well locations are shown on Figure 3.4.

3.4.1 Monitoring Well Installation and Sampling

The two overburden monitoring wells (MW-14 and MW-15) were installed by ADT using a truck-mounted HSA drill rig on May 19, 2014. MW-14 and MW-15 were installed to depths of 15 feet and 14.5 feet, respectively, and completed with 5 feet long PVC well screens and 2-inch diameter PVC risers. The annular space between the borehole wall and well casing was filled with a cement/bentonite grout mixture. Moreover, a protective flush mount casing was installed at the ground surface.

From May 19 to June 6, 2014 CRA undertook the development of the two new wells (MW-14 and MW-15) and the re-development of an existing monitoring well (MW-10) and an existing piezometer (PES-1), all of which are located in the OU-3 Source Soils area. In addition, all the aforementioned wells were sampled, as well; however, piezometer PES-1 was sampled as a surrogate for monitoring well MW-09, which could not be located during the sampling event and was believed to be destroyed. PES-1 was deemed a satisfactory alternative as it is located approximately 10 feet north of MW-09. During the sediment investigation within the week of November 10, 2014, a broken monitoring well collar was identified on the ground in the area adjacent to PES-1, which is believed to be missing monitoring well MW-09. A well riser could not be located and a subsequent sweep of the area, with a metal detector, could not locate the well. Monitoring wells MW-10, MW-14, and MW-15 continued to exhibit high turbidity readings despite a total of 10 well volumes being removed from each well prior to sampling. The CRA field geologist observed an oily sheen and strong odor from the PES-1 groundwater. All groundwater samples were submitted to Spectrum Analytical Inc. for analyses for the presence TCL VOCs, TCL SVOCs, TAL metals and PCBs. The groundwater analytical results from Spectrum Analytical Inc. are presented in Appendix I, of the OU-3 Upland Soil Pre Design Investigation Report. The laboratory analytical results were validated by CRA's project chemist and the data validation report is presented in Appendix C of the OU-3 Upland Soil Pre Design Investigation Report.

3.4.2 Groundwater Sampling Results

Analytical groundwater results for wells located in the OU-3 Source Soils area are presented in Table 3.4 and include data from 2009 to 2014. The data were compared to the NYSDEC Class GA Groundwater Standards (refer to Figure 3.4). The 2014 analytical results for MW-9, MW-10, MW-14, and MW-15 all had concentrations of VOCs, SVOCs, metals, and PCBs above the NYSDEC standards. The 2014 MW-10 groundwater results are consistent with the 2009 groundwater results. It was noted that MW-14 reported the highest relative concentrations of chemical parameters on the OU-3 Source Soils area. In 2014 concentrations of VOCs, SVOCs, and PCBs at PES-1 were above the NYSDEC standards however, they were not detected in 2009. PCB was detected at 20 mg/L at PES-1. In addition, MW-09 was screened in the bedrock aquifer while the PES-1 piezometer is installed in the shallow overburden aquifer. The potentially high concentration of PCBs in the source area may impact groundwater treatment decisions and disposal options. In addition to the above samples, further groundwater sampling in the OU-3 Source Soils area was undertaken at the new overburden wells (MW-14 and MW-15) and two existing wells (PES-1 and MW-10). All samples were submitted for chemical analysis to assess possible water treatment requirements. The results for the composite sample are presented in Table 3.5. The presence of PCBs, VOCs, SVOCs and metals was noted within the analytical results and consequently requires the development a treatment and disposal strategy for water collected during dewatering activities. These data will be compared to the Town of Waterford sanitary sewer use requirements.

Groundwater monitoring was performed in December 2015 in accordance with the NYSDEC approved Groundwater Monitoring Plan. The results for the routine groundwater monitoring will be presented in separate submittals to NYSDEC.

4. Pre-Design Investigation – OU-3 Sediments

4.1 Pre-Design Investigation Objectives

The OU-3 sediment remediation activities involve removal of sediment from OU-3 which exceeds the Standards, Criteria, and Guidance (SCG) concentration of 1 mg/kg total PCBs. Sediments with total PCB concentrations greater than or equal to 50 mg/kg will be removed and disposed as TSCA-regulated waste. Removal of TSCA-regulated material may involve deeper excavation of sediments and soils adjacent to the OU-3 Source Soils area. This upland area is discussed in detail in the Work Plan for OU-1 and Upland Source Soils in OU-3 (CRA, July 9, 2013). Information obtained as part of the OU-3 Source Soils area pre-design investigation is presented in the Pre-Design Investigation Report, OU-1 and Upland Source Soils in OU-3 (CRA, January 27, 2015). This information will be utilized in conjunction with data collected for OU-3 sediment to support detailed design activities for the OU-3 sediment exceeding 50 mg/kg PCBs.

Additional pre-design data were necessary in order to complete the remedial design for OU-3 sediments. Specific pre-design data collection tasks include:

- Collection of additional sediment samples to further define the vertical extent of PCB concentrations greater than or equal to 50 mg/kg PCBs.
- Collection of additional sediment samples to further define the horizontal and vertical extent of sediment which is below 50 mg/kg PCBs but exceeds the SCG concentration of 1 mg/kg PCBs.
- Characterization of sediment for disposal.

- Provide additional sediment physical data to evaluate dewatering characteristics.
- Characterization of wastewater anticipated to be generated during sediment removal and dewatering in order to evaluate pre-treatment requirements.
- Identification of utilities, access points, haul routes, and nearby receptors.

This following sections presents the pre-design data collected in accordance with the Work Plan for OU-3 Sediments (Sediment Work Plan).

4.2 Historical Data

The available historic sediment data for OU-3 was reviewed as part of preparation of the Sediment Work Plan. Sediment data was included in the following reports that were available during the preparation of the Sediment Work Plan:

- Summary Report for a Preliminary Site Assessment, Friedrichsohn Cooperage Site (5-46-045), EA Engineering, October 2008.
- Focused Remedial Investigation/Feasibility Study, Malcolm Pirnie, April 2010.
- Proposed Remedial Action Plan, Operable Unit Number 03, NYSDEC, February 2011.
- Record of Decision, Operable Unit Number 03, NYSDEC, March 2011.
- Post RI Pre-Design Sediment Sampling Data Tables and Sample Location Figures, Malcolm Pirnie, December 2011.
- Fact Sheet, Operable Unit Number 01, NYSDEC, October 2012.
- Record of Decision, Operable Unit Number 01, NYSDEC, December 2012.
- Order on Consent and Administrative Settlement, Index A5-074-1202 Friedrichsohn Cooperage Site #564045.

Of the eight documents listed above, four included tabulated data for sediment. The remaining documents include summary statistics for the data but not the parent data. The parent data for the sediment data summaries presented in OU-3 ROD and PRAPs were provided by the NYSDEC in electronic Equis file format.

A summary of the number of sediment samples collected within OU-3 and the associated sampling events are as follows:

- **April 2008** – A total of eight sediment samples were collected from four Canal locations (SD-01 to SD-04) using a slide hammer with a stainless steel sample collection bucket.
- **August 2009** – A total of 36 sediment samples were collected from 31 Canal locations (FC-SD-01 to FC-SD-31) and two sediment samples were collected from west of Garret Field (FC-SD-32 and FC-SD-33). Sediment samples were collected by advancing Macrocore sleeves manually or with a Geoprobe direct-push drill rig. Borings in the Canal center channel were collected using a floating barge. Borings drilled inside of the fence were advanced from shore.
- **April 2010** – A total of five sediment samples were collected from five Canal locations (FC-SED01 to FC-SED05).

- **January to March 2011** – A total of 288 sediment samples from collected from 108 Canal locations (SD-01 to SD-70, SD-73 to SD-75, SD-77 to SD-81, SD-84 to SD-85, SD-89 to SD-94, SD-103 to SD-124).

Data obtained from sediment samples collected during two sampling events (April 2008 and August 2009) were utilized to support development of the Feasibility Study. These data as well as data generated from a sampling event in February 2011 were utilized to support development of the OU-3 ROD. The 2008 and 2009 sampling events focused on surficial sampling and did not include any discrete samples located entirely below the anticipated average sediment removal depth of two-feet identified in the OU-3 ROD (page 22). Data collected in the February 2011 sampling event included deeper sample intervals.

4.2.1 Sediment Delineation

Based on review of the available data, a number of uncertainties were identified and utilized to define the scope of additional delineation presented in the Sediment Work Plan as described below:

i. **Delineation of TSCA Regulated Sediment:** Significant effort has been made to delineate the extent of sediment with total PCB concentrations greater than or equal to 50 mg/kg which will be subject to disposal in a TSCA approved disposal facility (TSCA material). A total of 22 sample locations were identified where total PCB concentrations exceeded 50 mg/kg. The limits of TSCA material against the northern bank of the canal have been well defined horizontally. Additional sampling was proposed in the Sediment Work Plan to provide additional data to refine the limits of TSCA material.

ii. **Delineation of less than 50 mg/kg PCB Sediment:** Limited delineation of the horizontal extent of sediment exceeding the total PCB SCG of 1 mg/kg was determined to be beneficial to ensure areas not requiring removal are fully defined. Additional vertical delineation throughout most of the canal between O'Connor Drive and Burton Avenue was proposed in the Sediment Work Plan to support development of cut lines for sediment removal as part of the Remedial Design.

A total of 43 sediment core sampling locations were proposed in the Sediment Work Plan.

4.3 Pre-Design Data Collection and Results

Pre-design data collection activities included the following tasks:

- Sediment Volume Delineation
- Dewatering/Stabilization of Dredged Sediment
- Wastewater Characterization
- Utility Locates and Other Pre-Design Activities

A description of each of the pre-design investigation activities are presented in the following subsections.

Sampling activities were completed in accordance with a Canal Work Permit issued by the NYSCC.

4.3.1 Sediment Volume Delineation

Additional sediment delineation was completed to meet the following objectives:

1. Further delineate vertical extent of material with greater than or equal to 50 mg/kg PCBs in OU-3 sediment.
2. Further delineate vertical and horizontal extent of material exceeding 1 mg/kg PCBs in OU-3 sediment.
3. Confirm and refine the limits of areas of sediment which do not exceed the PCB SCGs and which may remain in place.
4. Identify any significant layers of non-TSCA regulated sediment overlying TSCA regulated sediment which may be effectively segregated from TSCA material.
5. Identify layers of sediment with PCBs at concentrations below the SCGs which overly sediment exceeding SCGs and which may be effectively segregated and remain in the canal.
6. Identify the depth to the canal liner and possibly bedrock in the canal.

4.3.1.1 Field Investigation Summary

A total of 120 sediment samples (including six duplicates) were collected from 43 locations (SD-200 through SD-242) by CRA in November 2014. Sediment sampling locations from the current investigation are presented along sediment sampling locations from the historic investigation on Figure 4.1.

Table 4.1 presents a summary of sediment coring activities. Stratigraphic information was recorded by a CRA[1] field geologist and core logs are provided in Appendix B of the OU-3 Sediments Pre Design Investigation Report. In general, there was very little differentiation in the visual characterization of sediment through the sediment column.

All sediment samples were submitted to Spectrum Analytical, Inc. for PCB analysis consistent with the procedures defined in the QAPP, presented as Appendix C to the Sediment Work Plan. Samples collected for PCB analysis were also evaluated to obtain physical data (grain size and moisture content) and Total Organic Carbon (TOC) data. Grain size and TOC samples were selected in the field to be representative of differing sediment deposits based on visual classification. Six samples were submitted for TOC analysis. In accordance with the Sediment Work Plan, some samples for PCB analysis were held in the laboratory pending receipt of sediment samples collected from shallower depths. The laboratory was directed to analyze the held samples if delineation of greater than 1 mg/kg PCBs was not achieved. In total, 100 of 120 samples collected were analyzed as presented in Table 4.1. All samples were analyzed within the sample hold times in the QAPP. Sediment analytical data reports from Spectrum Analytical, Inc. are provided in Appendix D of the OU-3 Sediments Pre- Design Investigation Report and the results are summarized in Table 4.2. All 2014 sediment data has been validated and a validation memorandum is provided in Appendix E of the OU-3 Sediments Pre- Design Investigation Report. The 2014 sediment sampling results are presented on Figure 4.1.

4.3.1.2 PCB Sediment Sampling Results

Sediment results from the current investigation were reviewed and compared to the historical sampling results for sampling locations within Old Champlain Canal. The 2014 sediment sampling results are presented in Table 4.2 and on Figures 4.1, 4.2, and 4.3.

[1] Conestoga-Rovers & Associates (CRA) became GHD Limited on July 1, 2015. For consistency and convenience, the wording in this report will reflect the new name.

The limits of TSCA material against the northern bank of the canal had been well defined previously. The areas of uncertainty in the limits of TSCA material previously identified in the Sediment Work Plan have been sufficiently delineated. The vertical extent of sediment with concentrations of PCBs greater than or equal to 50 mg/kg has been defined vertically and is consistently within the top 4 feet of sediment within the Canal.

Based on historical data and completion of pre- design sampling activities, the presence of PCBs exceeding the total PCB SCG of 1 mg/kg has been sufficiently delineated and is shown on Figure 4.1, 4.2, and 4.3. Limited additional sampling may be completed in advance of remediation to further refine limits of sediment removal.

4.3.2 Dewatering/Stabilization of Dredged Sediment

4.3.2.1 Field Investigation Summary

During the November 2014 sediment investigation, additional sediment from the upper 4 feet of sediment was collected and homogenized into a bulk sediment sample for treatability testing. Core locations for the bulk sediment sample were selected in the field in order to provide representative coverage of areas of sediment removal from the Canal.

4.3.2.2 Dewatering/Stabilization of Dredged Sediment Results

Appendix F of the OU-3 Sediment Pre- Design Investigation Report presents a technical memorandum that summarizes sample collection and handling, characterization, and testing procedures and results for the bench scale stabilization tests. The treatability study identified that mechanical dewatering, gravity dewatering and stabilization with the addition of stabilization reagents were potentially applicable methods to meet landfill acceptance criteria for the sediment following excavation. Based on the evaluation, gravity dewatering will be utilized. If the sediment and/or wet soil from the upland source area is too wet to satisfy disposal criteria, the sediments/soil will be stabilized with a reagent such as fly ash or cement kiln dust in accordance with the bench scale study recommendations.

4.3.3 Wastewater Characterization

Dewatering filtrate from the dewatering treatability testing was collected and characterized to support development of wastewater treatment requirements as part of the Remedial Design.

Appendix F of the OU-3 Sediment Pre- Design Investigation Report presents a technical memorandum that summarizes sample collection, handling, characterization, and testing procedures and results. These data were used to support development of the wastewater treatment design requirements. Potential disposal options include the Town of Waterford sanitary sewer (on Saratoga Avenue), the Canal or an off-Site disposal/treatment facility.

4.3.4 Utility Locates and other Pre-Design Activities

Local utilities were contacted prior to initiation of the field investigation to identify the availability of utilities which may be needed to support remedy implementation and utilities which exist within areas to be remediated. A call made to Dig Safe New York in November 2014 obtained a response of "Clear, No facilities within 15 feet of the excavator defined work area" for area utilities. Stormwater entering the Canal work areas from overland flow or point discharges into the canal will

be temporarily diverted during sediment removal activities. GHD evaluated potential access points to OU-3 from areas other than through the OU-1 area. No other suitable areas were identified.

4.4 Overview

The pre-design sediment sampling and analyses for delineation purposes is complete.

Sediment Volume Delineation

Sufficient information has been obtained through the completion of the Pre-Design Sampling to provide vertical and horizontal delineation of TSCA material and material with concentrations of PCBs above the SCG for total PCBs. The location of TSCA material with PCBs greater than or equal to 50 mg/kg was confirmed to be confined to the area adjacent to the Site and at one sample location east of the Site. Additional delineation at the canal location east of the Site will be required during the remedial action to confirm the final limits of TSCA material.

The areas of uncertainty in the delineation of material exceeding the total PCB SCG that were identified in the Sediment Work Plan were addressed by the Pre-Design Sampling.

Dewatering/Stabilization of Dredged Sediment

The treatability study identified that mechanical dewatering, gravity dewatering and stabilization were potentially applicable methods to meet landfill acceptance criteria for the sediment following excavation. Sediment removal is anticipated to be completed while the canal is dewatered, further reducing the initial water content of the sediments. GHD anticipates that mechanical dewatering will not be required. Much of the sediment will likely meet disposal facility criteria with little to no dewatering. For the material which does require dewatering, gravity dewatering will be employed. The remedial Contractor will be required to maintain a quantity of stabilization reagent on site to be used to augment gravity dewatering if necessary or desirable to efficiently complete remedial activities.

Wastewater Characterization

These data were utilized along with estimated groundwater volumes and characteristics and disposal criteria to determine the preliminary wastewater treatment system components and storage volume requirements. This will be confirmed for the Final Design depending on the most likely disposal scenario (sanitary or Canal).

Utility Locates and other Pre-Design Activities

The information obtained on utilities, access points, haul routes, and nearby receptors has been incorporated into the Remedial Design process. The owners of utilities which are needed to support the remedy implementation, or which will be temporarily diverted to facilitate sediment removal, will be contacted during the Remedial Design to confirm the acceptability of proposed activities. Haul routes will be established for both disposal of waste materials and importation of clean fill.

5. Proposed Remedial Action

The Remedial Action (RA) may be conducted in phases to coincide with periods when in canal work is permitted by the NYSCC and/or weather conditions.

The following are the remedial action cleanup objectives for the OCC from O'Connor Drive in the south to Burton Ave north of the site and area directly upland from the Canal:

- Removal of sediment within the Old Champlain Canal for off-Site disposal to achieve a cleanup goal of 1 mg/kg, for the marker compound PCBs, in the Canal sediment. The contaminants identified in the sediment and the source area which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process, are PCBs, chlorinated compounds (tetrachloroethene, trichloroethene, dichloroethene, vinyl chloride, and chlorobenzene), BTEX, phenolic compounds (phenol and dimethylphenol), hexachlorobenzene, and metals (arsenic, barium, chrome, and lead).
- Where necessary, replace the excavated sediments in the canal with clean fill to establish the original design depth of 6 feet.
- Removal and disposal of sediments or soil along the Canal bank and adjacent to the site excavation which contains PCBs equal to or above 50 mg/kg and chlorinated compounds (tetrachloroethene, trichloroethene, dichloroethene, vinyl chloride, and chlorobenzene), BTEX, phenolic compounds (phenol and dimethylphenol), hexachlorobenzene, and metals (arsenic, barium, chrome, and lead). The estimate includes excavation of approximately 1,000 cubic yards of material from the Canal bank and canal adjacent to the Site down to bedrock, an approximate depth of 7 feet.
- Removal of approximately 2,800 cubic yards of soil from onsite within the upland delineated area of soil containing PCBs equal to or above 50 mg/kg and chlorinated compounds (tetrachloroethene, trichloroethene, dichloroethene, vinyl chloride, and chlorobenzene), BTEX, phenolic compounds (phenol and dimethylphenol), hexachlorobenzene, and metals (arsenic, barium, chrome, and lead). The contaminated soil in this area will be removed to bedrock, approximately 16 feet deep. The remedy will replace the excavated soil onsite with clean fill which will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).
- Design elements to stabilize excavations, control water in the excavation, control odors, and dewater the excavated materials. In areas where the excavation does not end at bedrock, the design will also require confirmation samples be collected at the completion of the excavation.

5.1 Old Champlain Canal Sediments - OU3

The areas of the Canal sediment to be removed are shown on Figure 5.1 and 5.2 (PCBs > 1 mg/kg and PCBs ≥ 50 mg/kg respectively). The removal depths are based on the sediment sample results from the sediment investigations. The required depth of sediment removal in the Canal ranges from approximately 0.5 to 6 feet.

The estimated volume of Canal sediment to be removed is approximately 12,250 cubic yards. Approximately 750 cubic yards of sediment has PCBs greater than or equal to 50 mg/kg and will be managed as a TSCA waste. This includes sediment with PCBs greater than or equal to 500 mg/kg. The greater than or equal to 500 mg/kg sediments will be removed before removal of sediments with PCBs greater than or equal to 50 mg/kg but less than 500 mg/kg. Verification sampling will be performed to confirm removal of greater than or equal to 500 mg/kg material and greater than or equal to 50 mg/kg material. Approximately 11,500 cubic yards of sediment has PCBs greater than 1 mg/kg but less than less than 50 mg/kg. The volumes may change based on verification sample results following the removal of sediments to the depths proposed based on pre design sampling.

The sequence for sediment removal has not yet been determined pending further discussion with the NYSCC about working requirements associated with draining the OCC during the navigation season. Hydraulic monitoring will be completed in 2016 in conjunction with operation of Erie Canal locks E2 and E3 to assess the impact of isolating the southern leg of the OCC during the navigation season. Details on the sequence of sediment removal will be included in the Final Design submission.

Representative verification sampling of the excavation will be conducted to demonstrate that the cleanup goals have been met. This verification sampling will be performed after removal to the design horizontal and vertical extent has been conducted. The excavation will be expanded if PCBs are detected above the cleanup goals during the verification sampling. Sampling will be performed in accordance with the Verification Sampling Plan and Field Sampling Plan. Verification sampling requirements are outlined in Section 6.8.6.

The Canal remedial action will include clearing and grubbing along the Canal bank where needed, stormwater management, dewatering, sediment removal/stabilization/off-Site disposal, water treatment and discharge, and restoration activities.

Surface water flow diversions will be required during the removal of the impacted sediment from the Canal. The work zone (i.e., a segment of the Canal being remediated) will be isolated allowing the Contractor to work in the Canal. Storm water from outside the active work zone will be contained or diverted around the work zone. To the extent possible, sediment removal will be performed when the canal is in a dewatered state. Cofferdams will be installed to isolate the Canal work zones once the water has been drained by the NYSCC. The cofferdams will be maintained until all the impacted sediments are removed and the Canal bed has been restored.

Surface water within the Canal that is not within an active canal work zone will be collected and pumped or transferred and discharged without treatment. Any surface water collected in the active work zone will be pumped to the on-Site Wastewater Treatment Facility for temporary storage and/or treatment and disposal. Surface run-on into the work area will be minimized to the extent practicable and feasible. Clean areas of the Canal will be isolated from work areas to prevent re contaminating clean areas.

Site Preparation activities, including soil erosion and sediment controls will be installed prior to conducting remedial activities in the Canal and at the Site.

Once the erosion and sediment controls are in place as well the canal cofferdams, stormwater control berms, the Wastewater Treatment Facility and the Sediment Management Facility; sediment removal will be conducted. Based on the sampling data for the sediment within the Canal, the Canal consists of sediment over a sand and silt soil layer overlying bedrock. In some areas the sand and silt soil layer was not identified. A constructed Canal base liner was not found during the pre-design investigation. This is consistent with information provided by the NYSCC which indicated that the Canals were excavated to grade and then flooded with a water and clay slurry. Clay particles would be drawn by flow to areas of leakage in the Canal bottom until they filled the flow path and stopped the leakage.

A conventional bucket excavator will be used to remove sediment by excavating from the Canal bed. The removed sediment will be transported to the Site Sediment Management Facility for dewatering and stabilization (if necessary), prior to transportation and off-Site disposal. Due to upland staging area limitations, excavated sediment may be temporarily managed within OU-3 to

allow for additional dewatering. All stockpiles will be managed to ensure air quality and odor criteria are met.

The Canal will be restored upon confirmation that the clean up goals have been achieved. Restoration may include backfilling in locations where bedrock was exposed and grading in accordance with the NYSCC requirements. Disturbed canal banks adjacent to the Site will be revegetated.

5.2 Cooperage Property – OU-1 and OU-3 Source Soils

The proposed OU-1 and OU-3 Source Soils RA will involve removal of OU-3 Source Soils to bedrock and removal of up to 2 feet of overburden soils in OU-1 outside the limits of the OU-3 Source Soils area. Once all excavated OU-1 soils have been disposed off site and the OU-3 Source Soils excavation has been backfilled to within 2-feet of the proposed final grade, a 2- foot soil cap will be installed over the Site using clean imported fill to achieve restricted residential use criteria subject to an environmental easement. The soil cap will be graded to match the surrounding grade and allow for positive drainage towards the Canal.

The volumes of soil to be removed from OU-1 and OU-3 Source Soils are approximately 1,800 cubic yards and 4,200 cubic yards, respectively, based on historic sampling and the pre design sampling. The expected volume of soils with PCBs ≥50 mg/kg is approximately 210 cubic yards. Verification samples will be collected at specific depth intervals in the 3 areas of the OU-3 Source Soils excavation to ensure that soils with PCBs greater than 50 mg/kg are completely removed so they can be staged separately from underlying soils with PCBs less than 50 mg/kg. Soils with PCBs greater than or equal to 500 mg/kg were detected in Area 3. These soils will be excavated and staged separately from soils with PCBs greater than or equal to 50 mg/mg and less than 500 mg/kg. Verification sampling will be performed at specific depths to confirm removal of all soils with PCBs greater than or equal to 50 mg/kg. Once soils with PCBs greater than or equal to 50 mg/kg have been removed, the remaining soils will be removed to bedrock without further sampling.

Removal of the OU-3 Source Soils will be completed before removal of OU-1 soils. It may be necessary to remove some or all of the OU-3 Source Soils in conjunction with removal of impacted sediments in OU-3 adjacent to the Site. Shoring around the OU-3 Source Soils could be installed once the OU-3 sediment excavation adjacent to the Site was completed to the desired depth, then allowing the OU-3 Source Soils excavation to continue to bedrock.

The locations and sizes of soil staging pads at the Site will be adjusted to waste streams to include:

- Soils with PCBs ≥500 mg/kg
- Soils with PCBs ≥50 mg/kg
- Soils with PCBs <50 mg/kg

5.3 Wastewater Treatment

An on-Site Wastewater Treatment Facility will be constructed and operated to manage surface water, stormwater, and groundwater generated from remediation areas. The Wastewater Treatment Facility will be used to store and/or treat potentially contaminated water prior to discharge or off-Site disposal. GHD met with the Town of Waterford Engineer and the Town wastewater treatment plant operator on January 29, 2016 to discuss the potential to discharge to the sanitary system.

Discharge of potentially contaminated water (classified by the town as Industrial Waste Water) would require approval by the Town and the NYSDEC. If allowable, discharges would potentially have volume constraints and specific limits for suspended solids, pH, temperature, metals and organics.

Discharge of treated groundwater to the Canal would be subject to a SPDES permit. The discharge criteria for this option are likely to be more stringent than the allowable sewer discharge limits however that will be evaluated for the Final Design.

Water that cannot be discharged to the Canal/sanitary discharge will be disposed off-Site at a licensed facility.

5.4 Sediment and Soil Management

Excavated sediment and soil will be staged, dewatered, stabilized, if required, and tested prior to transportation and off-Site disposal. Sediments and soils expected to contain PCBs ≥ 50mg/kg will be stockpiled separately from sediments and soils with PCBs <50 mg/kg in the Sediment Management Facility. In addition, sediments expected to contain PCBs ≥ 500 mg/kg will be staged separately or placed directly into a roll-off. Wet sediment containing PCBs <50 mg/kg may be temporarily staged in the Canal at designated locations but will eventually be transported to the Sediment Management Facility constructed on OU-1. The staging area will be constructed to contain the water that drains from the sediment and soil.

Sediment and soil will be dewatered and stabilized to the extent necessary prior to loading for transportation and off-Site disposal. If gravity dewatering is not effective, sediment will be solidified with the addition of a solidification agent. To mitigate dust, odors and to keep the stockpiled material as dry as possible, the piles will be covered at the end of each day. Treatability testing completed during the pre-design investigations identified that both Portland cement and a Portland cement/cement kiln dust blend were effective as solidification reagents to meet paint filter testing requirements for land disposal.

The sediment and debris will be characterized prior to off-Site disposal by representative sampling and chemical analysis. The majority of the sediment and soil is anticipated to be non-hazardous and will be disposed of at a Subtitle D landfill that can accept soils and sediments with PCBs <50 mg/kg. Sediment and soil containing PCBs ≥ 50 mg/kg will be managed as TSCA-regulated material and disposed of at a TSCA landfill as hazardous waste. Sediment and soil containing PCBs ≥ 500 mg/kg will be managed as TSCA-regulated material and incinerated at a licensed facility. Additional details on waste management and disposal is presented in Section 6.12.

Stockpile sampling procedures will be detailed in the FSP included in the Final Design report. Procedures for stockpile management and loading for disposal will be detailed in the Waste Management Plan included in the Final Design.

5.5 Restoration

Following remediation activities, the areas of the Canal that are impacted by sediment removal activities will be restored to meet the NYSCC requirements. In locations where bedrock is exposed, remaining clean sediments will be graded and mixed with imported clay to achieve the approved restoration grade. Final grades for the canal will be included in the Final Design after further discussion with NYSCC. No hydric or topsoil will be placed in the Canal bed as natural processes

will result in the accumulation of organic material and sediment over time. Disturbed banks areas will be graded to a stable slope and overlain with topsoil, natural seed mix, and erosion control fabric.

The temporary erosion controls such as silt fence and hay bales will be left in place until the disturbed areas are stabilized.

6. Engineering Design

This section presents the design objectives and criteria for the major elements of the RA and is organized as follows:

- Section 6.1 Access
- Section 6.2 Security
- Section 6.3 Construction Support Facilities
- Section 6.4 Site Preparation
- Section 6.5 Environmental Controls
- Section 6.6 Health and Safety and Contingency and Emergency Response Plan
- Section 6.7 Community Air Monitoring Plan
- Section 6.8 Sediment and Soil Removal and Handling
- Section 6.9 Solidification
- Section 6.10 Canal Restoration
- Section 6.11 OU-1 and OU-3 Upland Source Soil Final Cover
- Section 6.12 Transportation and Disposal
- Section 6.13 Air Quality Monitoring
- Section 6.14 Water Management
- Section 6.15 Closeout

Preliminary design drawings are provided with this report.

Additional drawings or drawing details will be added as necessary during the completion of the Final Design.

In addition to the preliminary design drawings, a list of proposed project technical specifications was developed and is presented below. The specifications will be included with the Final Design and will provide detailed technical and regulatory requirements to construct the remedy in accordance with the Order and applicable Federal, State, and local regulations and guidance. The technical specifications for the Final Design will include:

- Division 01 - General Requirements
  - Section 01 10 00 Summary
  - Section 01 20 00 Price and Payment Procedures

  - Section 01 30 00 Administrative Requirements
  - Section 01 33 00 Submittal Procedures
  - Section 01 35 29 Health and Safety
  - Section 01 40 00 Quality Requirements
  - Section 01 50 00 Temporary Facilities and Controls
  - Section 01 57 13 Temporary Soil Erosion and Sediment Controls
  - Section 01 57 20 Temporary Wastewater Treatment Facility
  - Section 01 60 00 Product Requirements
  - Section 01 70 00 Execution and Closeout Requirements
- Division 02 - Existing Conditions
  - Section 02 55 00 Remediation Soil Solidification
  - Section 02 61 13 Excavating and Handling of Materials
  - Section 02 61 19 Transportation and Disposal of Contaminated Materials
- Division 31 - Earthwork
  - Section 31 05 19 Geotextiles
  - Section 31 10 00 Site Clearing
  - Section 31 23 16 Excavation
  - Section 31 23 19 Dewatering
  - Section 31 23 23 Fill
- Division 32 - Exterior Improvements
  - Section 32 92 19 Seeding
  - Section 32 93 00 Plants

The Engineer will direct and generally oversee activities on behalf of the Companies during the implementation of the remedial action, including, holding regular construction meetings, inspection, testing, and documentation of construction activities, collection and management of information and data, ensuring compliance with permits and approvals, and development and preparation of the Final Engineering Report. The Engineer will provide overall project management and coordination between the Companies, off-Site property owners, NYSDEC, NYSCC, and the United States Army Corp of Engineers (USACE). The implementation of the remedial action activities will be conducted by a remediation Contractor selected by the Companies.

Following procurement of the necessary permits, access agreements, and preconstruction submittals, the remedial action activities will be initiated and will include the major activities listed below.

- Utility locates.
- Mobilization of construction facilities, Site trailer(s), material, equipment, and personnel necessary to perform the work.

- Provision and maintenance of construction facilities and temporary controls.
- Site preparation, including emergency first aid facility, fire suppression equipment, construction of decontamination facilities, soil erosion and sediment migration controls, temporary utilities, clearing, work zone identification, and staging facilities.
- Implementation of environmental controls.
- Implementation of a Site-specific Health and Safety Plan.
- Implementation of a Stormwater Management Plan.
- Construction/operation of a Wastewater Treatment Facility
- Construction/operation of a Sediment Management Facility to stage PCB impacted sediments.
- Removal and staging of miscellaneous debris (e.g., tree stumps, rocks, etc.) from the work zones, and on and off-Site disposal.
- Removal of Canal sediment.
- Sediment, dewatering and stabilization (if required).
- Sediment characterization, transportation and off-Site disposal.
- Canal restoration.
- Modification of Sediment Management Facility to accommodate removal of Site PCB impacted soils.
- Installation of shoring and dewatering system.
- Soil excavation.
- Backfilling and construction of a Site cap.
- Closeout activities, including final decontamination, cleanup/restoration of support areas, and demobilization of temporary facilities and equipment.
- Final Engineering Report (FER).

6.1 Access

Prior to and during RA activities, coordination with the City, NYSCC, and Property owners on either side of the Site will be conducted as required. The existing access location to the Site is shown on Drawing C-02. Additional gates may be required for construction equipment.

Coordination with the City, NYSCC, NYSDEC and Property owners, as required prior to implementation of the RA will include:

- Review of work activities to be completed including identification of anticipated work areas, transportation routes, and scope and timing of activities.
- Review of vegetation which requires clearing and restoration plans.
- Periodic updates of work progress and anticipated completion.
- Notification of additional truck traffic.
- Permit requirements.

6.2 Security

Existing fencing surrounding the Site will be used as appropriate for securing work areas. If necessary, supplemental temporary chain link or other types of construction fence will be placed at locations used to access the active work areas and will be used as a security fence during the RA construction period. The Contractor will be responsible for maintaining security. The Contractor will inspect, maintain, and repair the fencing, as necessary, to ensure protection of the public and security of the Site. Temporary fencing will be removed at the conclusion of the RA. The location of the existing security fence is shown on Drawings C-02. The security requirements will be specified in the Technical Specifications.

Access gates into the work areas will be kept closed and locked to prevent uncontrolled and/or unauthorized access to the work areas.

The NYSCC will close off the OCC walking trail from the Burton Avenue Bridge to the O'Connor Avenue Bridge while the remedial action is underway. Temporary fencing along the OCC walking trail may be required when sediment removal is underway. The need to limit access to the canal from nearby residences and public spaces will be evaluated and additional security measures may be required.

During active sediment and soil management and wastewater handling and treatment, or until all impacted materials are removed and wastewater treatment is completed, security will be provided including:

i. Limit vehicular access to the work areas to authorized vehicles and personnel only.

ii. Provide initial screening of all Site personnel and visitors. A list of authorized personnel and the name of their employer and documentation of appropriate health and safety training will be available at the access locations.

iii. Maintain a security log in which documentation is provided for all work area personnel, visitors and deliveries, and any security incidents. This log will include the date, name, address, company, time in and time out for each employee and visitor.

iv. Maintain a visitor log at the access locations. Visitors will not be allowed to enter without the knowledge and approval of the Engineer.

v. Check that all installations are secure and intact on a daily basis. If warning signs are removed, the situation will be brought to the attention of the Contractor and will be rectified at the earliest possible opportunity.

6.3 Construction Support Facilities

The following sections outline the required construction support facilities.

6.3.1 Site Office

Office facilities for the Engineer and for the Contractor will be provided and will meet the detailed requirements of the Technical Specifications.

6.3.2 Emergency First Aid

The Contractor will be required to supply and maintain a first-aid facility, which complies with the requirements of the HASP.

6.3.3 Spill Prevention and Fire Suppression

The Contractor will be required to provide necessary spill prevention and fire suppression equipment and procedures to prevent releases and ensure the safety of Site personnel and protection of the owner's property. Details of the spill prevention and fire suppression equipment and procedures, and contingency planning are provided in the HASP. Coordination will be established with the local Fire and Police Departments to respond to emergencies.

6.3.4 Decontamination

Prior to commencing work in the work zones, the Contractor will be required to supply and operate equipment and personnel hygiene/decontamination facilities. The requirements for the decontamination facilities and activities will be detailed in the Technical Specifications.

6.3.4.1 Personnel Hygiene/Decontamination

The Contractor will be required to supply and operate a personnel hygiene/decontamination facility that complies with the requirements of 29 CFR 1910.141.

Wastewater from the personnel hygiene/decontamination facility will be pumped to designated storage tanks and will be managed at the Wastewater Treatment Facility (Section 6.13).

6.3.4.2 Equipment Decontamination

The Contractor will be required to supply and operate an equipment decontamination facility. The Contractor will have sufficient pumping equipment and piping to pump wastewater from the decontamination pad to Contractor-supplied wastewater storage tank(s) for treatment at the Wastewater Treatment Facility or disposal off-Site.

All equipment leaving the Exclusion Zone (EZ) established for work zone access locations will be decontaminated on the decontamination pad using high-pressure, low-volume hot water and non-phosphate detergent (or equivalent), if necessary, and will be QC/QA inspected prior to entering the Clean Zone (CZ).

Sediments collected on the decontamination pad will be managed at the Sediment Management Facility (Section 6.8). Water from the decontamination facility will be managed at the Wastewater Treatment Facility (Section 6.14).

6.3.5 Sanitary Facilities

Portable toilet facilities will be provided and maintained by the Contractor. Sanitary wastes will be removed and disposed off-Site on a periodic basis in accordance with applicable laws and regulations. The detailed requirements will be specified in the Technical Specifications.

6.3.6 Utilities

Temporary utilities necessary for the completion of the RA will be provided by the Contractor either by temporary tie-in to existing utilities, or by provision of temporary facilities (e.g., generators, water tanks, etc.). The detailed requirements will be the Technical Specifications.

6.3.7 Access Roads/Parking

Temporary access roads will be constructed, as necessary, to allow for access and loading of material onto transportation vehicles and provide a route for transportation vehicles to pass through the decontamination area prior to leaving the work areas. The detailed requirements will be specified in the Technical Specifications.

The Contractor's excavation operations will be managed to minimize the contamination of imported granular material used for the construction of access roads. Imported granular materials used for the construction of access roads, if any, which contacts contaminated sediment will be excavated, tested and recycled or disposed appropriately.

Sufficient space for parking will be established and maintained by the Contractor. Due to the limited space available on-Site, the Contractor will likely establish an off-Site parking area for workers and, if necessary, shuttle workers to the Site.

6.4 Site Preparation

6.4.1 Clearing and Grubbing

The areas required for construction facilities, access, and the excavation area will be cleared to the extent required to implement the RA. Cleared above-grade vegetation will be disposed off-Site as non-impacted waste. Above grade vegetation is defined as vegetation located 1 foot or more above grade. All additional stumps and below-grade vegetation will be staged and disposed off-Site. Clearing and grubbing of potentially contaminated material is addressed as part of sediment and soil removal activities (Section 6.8).

The detailed requirements will be specified in the Technical Specifications.

6.4.2 Monitoring Well Decommissioning

Monitoring wells MW-8, MW-9, MW-10, MW-14, and MW-15 and piezometer PES-1 will be decommissioned in accordance with NYSDEC Groundwater Monitoring Well Decommissioning Policy CP-43. Monitoring wells required for long-term groundwater monitoring will be determined after the RA is completed.

6.5 Environmental Controls

The detailed requirements for environmental controls will be specified in the Technical Specifications

6.5.1 Fugitive Particulate Control and Odor Control

The Contractor will implement fugitive particulate control measures. The particulate control measures will be designed to limit the emissions of total suspended particulates (TSPs) that are likely to remain airborne and be carried out of the work areas and the Sediment/Soil Staging Area.

During the performance of the RA, the Contractor will be responsible for the control and monitoring of fugitive particulates generated by the excavation, stabilization, and transportation of sediments/soil and backfilling of soil. This may involve the following:

- Maintaining fugitive air emissions control measures such as a water misting system to prevent the generation of fugitive air emissions.
- Use of potable water for fugitive air emissions controls.
- The Contractor will not use any chemical means for dust and particulate control without prior review by the Engineer.
- Use appropriate covers on trucks hauling impacted or unimpacted material.
- In the event that the Contractor's dust control is not sufficient to control dust from the Site, work will be stopped and changes to the operations made prior to resuming work.

Odors typical of organic rich materials are expected during removal of Canal sediments and impacted soils. Due to the close proximity of residences and recreational areas odors are likely to be a concern. During the performance of the RA, the Contractor will be responsible for control and monitoring of odors. Abatement measures may include some or all of the following:

- Applying odor suppressants approved by the NYSDEC.
- Reducing or temporarily stopping active excavation to allow odors to dissipate.
- Covering soil and sediment stockpiles.

6.5.2 Sediment and Erosion Control Plan

A Stormwater Pollution Prevention Plan (SWPPP) will be included with the Final Design. The SWPPP will describe the intended erosion and sediment controls in accordance with the NYSDEC's *Standards and Specifications for Erosion and Sediment Control.* A Notice of Intent will be filed with NYSDEC prior to mobilization.

A detailed Sediment and Erosion Control Plan will be prepared and implemented by the Contractor. The requirements for sediment and erosion controls are shown on the Drawings and will be specified in the Technical Specifications.

The Sediment and Erosion Control Plan will incorporate the following features:

i. Stabilize disturbed soils as quickly as practical.

ii. All required in-Canal control structures will be constructed prior to any grading or sediment excavation to mitigate erosion and sediment migration and the potential contamination of Canal sediments that have been remediated and/or that do not require removal.

iii. All temporary erosion control fencing will be installed prior to any area grading or excavating or construction activities to minimize erosion and sediment migration from the Site and to delineate the limits of grading, excavation, and construction areas.

iv. A sediment/soil management facility pad will be constructed prior to any excavation of sediments from the Canal work areas or removal of soils from the upland work areas.

v. Straw bale walls and silt fence will be provided around the base of all clean stockpiles.

vi. Erosion protection of embankments.

vii. Contractor will be responsible for cleaning of sediments from vehicles, equipment and roadways at the end of each workday.

viii. Additional erosion controls may be required during the course of construction. Measures may include, but are not limited to, erosion control fences and mats, buffer strips, sediment traps, diversion swales and check dams, dikes, required to prevent erosion and migration of silt, mud, sediment, and other debris off-Site or to other areas of the Site where damage might result.

ix. All erosion controls will be inspected and documented by the Contractor to ensure installation and maintenance to the applicable requirements.

x. Erosion controls will be monitored for damage and sediment depth after each significant (e.g., greater than 0.5 inches) precipitation event and other extreme weather event. Damage will be repaired immediately. Sediment will be removed when accumulations reach one half of the available sediment storage depth or sooner.

xi. All erosion controls will remain in place and be maintained until disturbed ground surfaces have been stabilized.

xii. If soil and debris from the Site accumulates in low areas, storm sewers, roadways, gutters, ditches, or other areas in Engineer's determination it is undesirable, the accumulation will be removed and the area restored to its original condition.

xiii. Provide erosion and sediment control in accordance with applicable permits and approvals, and regulations.

The Contractor's Sediment and Erosion Control Plan will be provided to the Engineer for review and approval prior to implementation. Regular inspection and documentation of the soil erosion and sediment controls will be conducted by the Contractor and the Engineer as part of the Construction Quality Control/Construction Quality Assurance (CQC/CQA) activities.

6.5.3 Stormwater Control

Control structures will be installed at specified locations to minimize stormwater runoff impacting the work zones and to minimize run on into active work areas. The requirements for stormwater controls are shown on the Drawings and will be specified in the Technical Specifications.

Construction of stormwater controls prior to initiating excavation will control the potential for off-Site releases and minimize the amount of stormwater that contacts impacted material.

The Contractor will be required to control stormwater runoff in order to meet the following requirements:

i. Prevent Canal water from flowing from impacted areas to clean areas.

ii. Minimize stormwater entering a work zone either from the Canal outside of a work area or from adjacent areas and ponding in excavated areas through the use of temporary and

permanent earthen berms/swales/ and/or proper grading and by expediting backfilling of excavations.

iii. Ensure that Site soil removal and capping RA activities do not impact stormwater runoff quality to the Canal.

Stormwater flowing toward the work zones will be redirected, to the extent practical, through the use of dikes/swales diversions to minimize stormwater contact with potential impacted materials, surface water and/or stormwater runoff. Stormwater that comes in contact with potential impacted material will be considered contaminated water that the Contractor must manage.

6.5.3.1 OU3 Canal Work Areas

To limit the amount of stormwater entering the Canal from work areas, and private or City property outfalls, the following temporary measures will be taken:

- Establish protective berms in the Canal along the perimeter of the active sediment work zones to divert surface water from the upland properties adjacent to the Canal to areas of the Canal outside the work limits.
- Precipitation that enters the Canal outside an active work area will be pumped out to the extent possible and transferred to another section of the Canal or pumped to the Mohawk River. Watethat enters active work area r will be pumped to the Wastewater Treatment Facility where it will be treated prior to discharge to the sanitary sewer or disposed off-Site at a licensed facility.

6.5.3.2 OU-1 and OU-3 Source Soil Work Areas

To limit the amount of storm water entering the Site work areas on OU-1 and OU-3, the following temporary measures will be taken:

- Control or divert run off from adjacent properties.
- Establish protective berms around work areas.
- Establish protect berms around soil staging pads.

6.5.4 Sediment/Soil Staging Pads

The Contractor will construct a sediment/soil staging pad on-Site for temporary staging, stabilizing (if required) and testing of excavated material for both RA phases of work. The actual foot print of the staging pad will be determined by the Contractor. It may be possible to construct a larger staging pad during sediment removal work since space for excavation of soils on the Site will be not required and more of the Site can be used for temporary storage. The RA contractor will be required to contain and collect water from the sediment/soil staging pad by providing curbing and positive drainage to a collection sump. Water that drains from the sediment and soil and storm water will be transferred from the sump to the Contractor's temporary storage tank. All wastewater will be managed according to the wastewater management requirements provided in Section 6.14.

Sediments and soils staging pad(s) will be constructed using a 60 mil HDPE liner placed on a bedding layer or on native sub grade after removal of stones and debris that could puncture the liner. A sump will be installed within the footprint perimeter containment berm to collect water that drains from the soil/sediments and results from precipitation. The liner will be anchored into the

containment berm. Geotextile fabric will be placed on the liner and aggregate will be placed over the geotextile.

Soils and sediments will be staged based on waste classification and management requirements. Stockpiles will be covered with a heavy duty plastic tarp until adequately dewatered and waste characterization is complete. Contained water will be pumped to the wastewater management facility.

The staging pads will be inspected regularly and maintained.

6.6 Health and Safety and Contingency and Emergency Response Plan

A Site-specific HASP is required to ensure that all RA construction activities are performed safely and in accordance with applicable regulatory requirements, and that all persons on-Site, the general public, and the environment are protected from exposure to Site-related material during implementation of the RA construction activities at the Site. Each Contractor involved in RA construction activities at the Site will be required to develop, implement, and maintain their own Site-specific HASP for activities they will perform at the Site. At a minimum, each Site specific HASP must meet the requirements of the RD/RA HASP approved by the NYSDEC.

The basis for the HASP is the Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations (CFR), Parts 1910 and 1926 (29 CFR 1910 and 1926). All workers will have 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and current 8-hr refresher training before being allowed on-Site in accordance with CFR 1910.

The HASP addresses the following:

i. Worker medical surveillance.

ii. Worker training and Site orientation.

iii. Site Safety Officer designation and responsibilities.

iv. Work area designations.

v. The planned movement of labor, equipment, and materials from and between work areas as work progresses.

vi. Personnel and equipment decontamination facilities including planned disposal of decontamination waters and wastes.

vii. Air monitoring program(s) for the various work areas.

viii. Personal protective equipment to be used.

ix. Personal hygiene and decontamination procedures.

x. Respirator protection program and procedures.

xi. Emergency and first-aid equipment.

xii. Dust and particulate emission controls.

xiii. Monitoring and mitigation of worker heat and cold stress.

xiv. Safety meetings.

xv. Site communications and posted notices.

xvi. Site security.

A confined space entry program will be developed if confined space entry (CSE) is required to be implemented as part of the RA activities.

The HASP will be maintained at the Site at all times during the performance of the RA and will be made available and required to be adhered to by all Site personnel and visitors permitted to enter the work areas.

In addition, the HASP will include emergency response activities and contingency planning, as necessary, to ensure that there are specific sets of standard operating procedures (SOPs) to be followed for different types of emergencies. The emergency response activities will be designed to safeguard on-Site personnel, the public, and the environment in the event of an emergency.

The on-Site contingency and emergency response plan will include SOPs for the following potential emergencies:

i. Injury to on-Site personnel.

ii. Release of impacted sediment/soil or wastewater to the environment.

iii. Detecting gases or vapors at stop work levels as defined in the HASP in an excavation area.

iv. Fire at the Site.

v. The unlikely event of a leak of toxic gases from unknown sources such as rupturing of compressed gas cylinders or gas lines during excavation.

vi. Severe weather events and/or flooding.

vii. Utility breakage (e.g., gas line).

6.7 Community Air Monitoring Plan

Requirements for the Community Air Monitoring Plan (CAMP) will be included in the HASP. The CAMP will be implemented for the protection of the public and will involve air monitoring at the perimeter of the Site for fugitive VOC emissions and particulates. Due to the close proximity of the Site upland source soil area to Saratoga Ave and adjacent residences, fence line concentrations of VOCs will likely be consistent with the work zone concentrations. Therefore, initially, any exceedances of the fence line action levels in the work zone will trigger mitigation measures.

Action levels and contingency measures will be included for VOCs and dust. The dust action levels will be based on PCBs. In addition, PCBs samples will be collected during the as part of the CAMP.

6.8 Sediment and Soil Removal and Handling

6.8.1 Sediment Removal

The requirements for sediment removal and handling are shown on the Drawings, and will be included in the Technical Specifications.

The estimated volume of sediment with PCB concentrations equal to or greater than 50 mg/kg to be excavated from the canal is approximately 750 CYs. The estimated volume of sediment with PCB concentrations greater than 1 mg/kg but less than 50 mg/kg to be excavated from the canal is approximately 11,500 CYs. The layout of the initial excavation limits will be established prior to removal activities. The Contractor will be required to perform Site excavation activities according to the following requirements:

i. Perform tasks in an orderly and safe manner such that the movement and double handling of materials is minimized.

ii. Stormwater runoff will be directed away from excavations.

iii. Carry out measures necessary for dust emission control and odor from excavation, sediment/soil handling, and transportation activities.

iv. Coordinate in-Canal sediment removal with water management diversions (see Section 6.8.5).

The scheduling of excavation activities will be coordinated such that activities will be completed promptly following construction of stormwater controls based on weather/seasonal conditions.

Following the excavation of sediment to the specified elevations and areal extent, verification sampling will be conducted as described in Section 6.8.6 for the Canal. Based on the results of the verification sampling, additional excavation activities may be required. If additional excavation is conducted, verification sampling will be repeated to ensure that cleanup levels have been met.

Sediment removal includes removal from the top of the Canal bank adjacent to the Site down to the depth of the impacted sediment in the Canal as shown on the Drawings. The final excavation limits will be established by the Engineer based on survey confirmation and verification sampling.

A proposed sequence for sediment removal will be presented in the Final Design. The sequence may depend on requirements from NYSCC about water management in the Erie Canal pool and the northern and southern legs of the OCC during the navigation season as determined from pilot testing discussed in Section 6.14. It should be noted that the Contractor will be responsible for construction means and methods and the Contractor may propose an alternative sequencing plan for implementing the remediation.

The highest PCBs concentrations are along the north side of the canal, adjacent to the Site, down to a depth of 4 to 6 feet below the mud line and in the Canal bank bordering the upland source soils. Sediment removal adjacent to the Upland Source Soils will have to be coordinated to prevent undermining the upland soils and minimize impacted groundwater from seeping into the Canal. The final elevation of the excavation to remove OU-3 Source Soils to bedrock is approximately 37 feet NAVD88. The final elevation of the base of Canal excavation next to the Upland Source Soil is anticipated to be approximately 39 feet NAVD88. It may be necessary to provide shoring to support the Canal bed due to the expected greater depth of soil removal as part of the Upland Source Soil removal compared to the bed of the Canal adjacent to the Site.

OU-3 Source Soils Area 3 maybe initially used as the working platform to access OU-3 sediments along the bank. An excavator would be positioned on this platform to reach OU-3 sediments and the Canal bank. As sediments with PCBs greater than or equal to 50 mg/kg are exposed, these would be removed and overcut vertically by 6 inches. The toe of each cut will conform to the greater to or equal to 50 mg/kg horizontal limit of excavation. As sediments along the bank adjacent, to the

Source Soils Area 3 are removed, the excavation may extend into the OU-3 Source Soils. To maintain the stability of the working platform, the working bench would be progressively lowered to an elevation of 46 feet NAVD 88 (this will be above the static groundwater table).

To limit groundwater seepage into the Canal, dewatering will be performed around the perimeter of the Upland source soils. Once OU-3 sediments are completely removed adjacent to the Site, shoring or berming may have to be installed along the NYSCC boundary to allow removal of source soils to bedrock and the excavation to be backfilled in order to restore the Canal bank and the Canal bed adjacent to the Site.

Equipment will enter the Canal from the Site to allow removal of sediments that cannot be reached from the Site. A working access ramp will have to be constructed over the Canal bank and it will be removed when all Canal excavation and restoration work is complete.

Sediment removal will continue using excavators. If necessary, board mats will be installed on the Canal bed sediments to access work zones and allow dump trucks to transport sediments from the Canal to the upland sediment management facility or to a an in-Canal staging location. Sediment staging locations will be established in the Canal for sediments with PCBs<50 mg/kg. These would be in areas where impacted sediments had not yet been removed and the temporary staging areas would be bermed off. This temporary storage would be used if the upland sediment/soil management facility was filled to capacity pending testing and off-Site disposal of sediments.

6.8.2 Soil Removal

Soils removal will be done in stages. During stage 1, the OU-3 Source Soils will be removed. As noted earlier, the southern limit of excavation for the OU-3 Source Soils is the Canal boundary which defines the northern limit of OU-3 (Canal sediments). The Canal bank, canal sediments along the bank and a section of the OU-3 Source Soils will need to be removed concurrently down to an elevation of approximately 34 feet NAVD 88. At that elevation, the removal of the Canal sediments with PCBs greater than or equal to 50 mg/kg will be completed adjacent to the OU-3 Source Soils. The OU-3 Source Soils excavation will terminate at bedrock which is approximately 18 feet bgs. The excavation will need to be shored on the east, north and west sides. The south limit will be shored only after the Canal bank and adjacent Canal sediments are completely removed. In order to continue the removal of OU-3 Source Soils to bedrock, the following controls will need to be implemented.

- Maintain dewatering of the OU-3 Source Soils excavation.
- Slope the south side of the excavation into the Canal or shore the side.

Three areas in the OU-3 Source Soils are shown as potentially having PCBs greater than or equal to 50 mg/kg. Within Area 3, soils with PCBs greater than or equal to 500 mg/kg were detected at two locations (SPB-9a at 1-2 feet and SB-74 at 7-8 feet). Excavation will proceed in 2 foot cuts down to 8 feet bgs. The soils with PCBs greater than or equal to 500 mg/kg will be excavated first before proceeding to removal soils with PCBs greater than or equal to 50 mg/kg. The soil removal in these areas will be sloped at 1.5 H to 1V in order that the base of the cut matches the limit of PCB greater to or equal to 50 mg/kg line shown on the Drawings. This will result in the limit of excavation being extended out approximately 3 feet from the cut line to ensure complete removal of impacted soil and PCBs greater than or equal to 50 mg/kg within each area. Verification sampling will be required to confirm vertical and/or horizontal removal of greater than or equal to 50 mg/kg material. The depths and locations for vertical verification sampling are shown on the Drawings. Side wall

samples will be taken around the perimeter of the excavation sample grids for removal of greater than or equal to 50 mg/kg material after every two foot excavation cut until PCBs greater than or equal to 50 mg/kg are removed. Once all greater than or equal to 50 mg/kg soil has been removed and verified by sampling, further verification samples will be not be collected as the excavations will proceed to bedrock.

The shoring design criteria as determined from the geotechnical investigation were presented in Section 3.2. A New York State licensed engineer working for the remedial Contractor will design the shoring to be compatible with the Contractor's excavation plan.

Once OU-3 Source Soils are completely removed, the excavation will be backfilled in lifts and compacted. As noted previously, a portion of the OU-3 Source Soils removal may be done concurrently with the removal of sediments adjacent to the Site.

6.8.3 Sediment/Soil Management Facility

Prior to initiating sediment removal activities, a Sediment/Soil Management Facility will be constructed as shown on the Drawings. Sediment and/or soil will be stockpiled on the staging pad to drain excess water, stabilized, and tested for waste characterization, prior to off-Site transportation and disposal.

Due to the depth of excavation required to remove OU-3 Source Soils, excavation below the groundwater table will be required. The final excavation depth is expected to be approximately 18 feet bgs (34 feet NAVD). The water table in July 2014 was approximately 46 feet NAVD. The Contractor will dewater the excavation. Excess water in the OU-3 Source Soils will be drained on the staging facility. Water from the excavation will be sent to the Water Treatment Facility (Section 6.14).

The sediment/soil management facility will consist of separate staging pads based on the PCB concentrations.

PCBs <50 mg/kg

PCBs ≥50 mg/kg < 500 mg/kg

PCB ≥ 500 mg/kg

Based on historical soil sampling data, isolated pockets of VOC impacted soil may be encountered when soils are excavated in the OU-3 Source Soils location and OU-3 sediments immediately adjacent to the OU-3 Source Soils. The concentrations of VOCs are not expected to effect the waste characterization unless free phase product is encountered. Any soils containing free phase product and/or PCBs ≥ 500 mg/kg will be staged separately or contained in a roll-off.

6.8.4 Canal Water Management

The Canal sediment removal will be performed under relatively dry conditions. This will eliminate the potential for re-suspension and transport of potentially impacted sediment and also provide a higher level of quality control as the removal of the impacted materials can be determined based on visual examination, surveying confirmation as well as verification sampling.

Cofferdams will be installed across the Canal at each end of the work area (west and east limits) to keep surface water from entering the work area when the Canal is refilled in the late spring by the NYSCC. The cofferdams will have to remain in place until all impacted sediments have been removed and the Canal bed is restored.

The work area of the Canal will be divided into manageable working zones and the water within those zones (groundwater seepage and/or precipitation) diverted around each zone. As the upstream and downstream ends of the Canal work area are cleaned, clean and impacted areas will be separated by temporary berms to keep potentially impacted surface water from entering a section of the Canal that has been remediated.

6.8.5 Sediment/Soil Removal Methods

The Contractor will be required to prepare an Excavation Plan specifying details regarding excavation methods, sequencing, and sediment stabilization methods to be used. The Excavation Plan will be submitted to the Engineer for review and approval. In general, the following procedure will be implemented and will form the basis for the Excavation Plan:

- Excavation will be conducted in a step-wise manner.
- Stormwater discharges entering the Canal will be temporarily diverted around active work areas.
- Temporary berms and/or ditches will be constructed to prevent surface water runoff from entering the work areas.
- Canal work areas will be allowed to drain by gravity to the maximum degree practicable prior to excavation. Residual water which remains in a work area will be pumped utilizing a skimmer pump and pumped to another location in the Canal. Upland stormwater that has come in contact with impacted soils will be pumped to the Wastewater Treatment Facility for treatment. Water (i.e., precipitation and groundwater seepage or water released as the sediment consolidates) that contacts impacted materials in the excavation area will be collected in sumps installed by the Contractor and will be pumped to the water treatment facility. Water that accumulates in the Canal, outside the active excavation area, will be pumped to another location in the Canal or to the Mohawk River.
- Sediment will be dewatered and, if necessary, stabilized at the Sediment Management Facility to enhance material handling properties and insure that the sediments will pass a paint filter test.
- "Clean" and "contaminated" work areas will be maintained and all transport vehicles will be restricted from entering the "contaminated" areas.
- Sediment/soils will be transported to an approved off-Site disposal facility for disposal in accordance with the procedures presented in the Waste Management Plan.
- Excavation will continue until all sediments with PCBs exceeding the clean-up standard of 1 mg/kg and visibly contaminated materials have been removed.
- Verification sampling will be performed in accordance with the protocols presented in Section 6.8.6 to ensure that cleanup levels have been obtained.

If a large storm event occurs, excavation activities will cease and equipment will be removed from the excavation. The work area will be covered with plastic to minimize the contact between water

entering the excavation and sediment. Once the storm event has passed, the collected water in the excavation area will be pumped and treated at the on-Site Wastewater Treatment Facility.

Additional details regarding the excavation of sediment will be presented in the Project Specifications.

6.8.6 Verification Sampling

6.8.6.1 Sediments

Following the excavation of sediment to the initial limits identified on the Drawings C-06 to C-09, verification sampling will be completed to evaluate the limits of the excavation and confirm cleanup goals are met. A rapid turnaround time for PCB analysis will be utilized for all verification sample analysis to minimize the time that the excavated area is required to remain open.

The strategy and sequencing for excavation and verification sampling of the sediments soils, is as follows:

1) Remove and clear all miscellaneous surface debris in and around the areas to be excavated.

2) All sediments will be excavated from the discrete depth intervals to the limits of excavation established based on the delineation activities.

3) Material which contains concentrations of PCBs at greater than or equal to 500 mg/kg will be excavated and placed on the staging pad or directly into roll-offs where it will be temporarily staged pending transfer off-Site for disposal. Soil/sediment with PCBs greater than or equal to 50 mg/kg will also be removed separately and handled as TSCA material. The limits of excavation for greater than or equal to 50 mg/kg and greater than or equal to 500 mg/kg sediment are shown on Drawing C-07. The staging pad will be lined and constructed in accordance with TSCA requirements. In general, it is anticipated that ≥50 mg/kg PCB material and <50 mg/kg PCB material will not be staged on the same pad at the same time. However, if this is required, the material will be kept separated on the pad. Any material becoming intermixed will be handled and disposed as ≥50 mg/kg PCB material. Staging of the excavated material will allow excess water to drain out of the material. This water will be collected in a sump on the pad, transferred to the treatment system, and treated. Sediment with concentrations of PCBs less than 50 mg/kg but greater than or equal to the cleanup criteria, will be excavated and placed on the Site staging pad or in an area of the Canal located outside the immediate removal area. After sufficient time to test the staged sediments and/or dewater, the under 50 mg/kg PCB material will be loaded into trucks and transported to an off-Site landfill.

4) Once the limits of the initial excavation have been reached, verification sediment samples will be collected in accordance with the Field Sampling Plan (FSP) from the excavation to determine if remaining sediments meet or exceed the specified cleanup criteria. If bedrock is encountered prior to achievement of the final cleanup goal, verification that no significant visible soil/sediment remains will be completed on a visual basis. No verification samples will be collect from bedrock. The specific protocols for determining the number and location of the verification samples is provided below.

5) The limits of excavation will be extended, if necessary, in the areas where verification soil samples indicate that remaining soils are above specified cleanup criteria. The vertical extent of additional excavation will be determined by the Engineer's representative based upon an

evaluation of the sediment conditions, locations of samples which exceed the specified cleanup criteria, and their respective concentrations.

6) Any surface water that enters the excavation will be collected for treatment or disposal.

7) Repeat steps 3), 4), and 5) until verification sampling demonstrates that remaining sediments are at or below specified cleanup criteria.

The Contractor will only be allowed to backfill when it has been demonstrated that the area meets the verification and cleanup criteria and all quality assurance requirements of the project QAPP.

6.8.6.1.1 Sediment Verification Sampling Procedures

Following initial excavation, a sampling grid will be laid out as shown on Figure 6.1. Each grid will be 2,500 square feet or less. Grids will typically be 50 feet by 50 feet unless the shape needs to be altered to follow excavation boundaries. If the excavation limit is extended beyond the limits of the grid by more than 20 feet, in each direction, an additional grid will be added to provide coverage for the additional area. Once excavation limits are reached, verification samples will consist of a 5-point composite sample collected from the top 4 inches of the sediment surface within each grid. All samples will be submitted for analysis on a rapid turnaround basis.

Verification sampling grids will be grouped into groups of 8 adjacent grids (total area of 20,000 square feet). Within the 8 grids, excavation will be deemed to be complete if no individual result exceeds 5 mg/kg PCBs and the average of all samples from the 8 grids is less than 1 mg/kg. If these conditions are not met, additional excavation will be performed in areas identified by the Engineer. The additional excavated areas will be re-sampled and the evaluation of verification sampling repeated. The process of verification sampling following re-excavation will repeat as necessary until the verification criteria are met.

Sample collection procedures outlined in the FSP will be followed. QAQC procedures will be followed for all sample analysis as outlined in the QAPP. All laboratory analytical results will be validated in accordance with the QAPP.

6.8.6.2 Soils

Soils with PCBs greater than or equal to 50 mg/kg within the OU-3 Source Soils will be removed to the initial limits shown on Drawings C-16 to C-21. Verification sampling will be completed to evaluate the limits of the excavation and confirm that PCBs greater than or equal to 50 mg/kg have been removed. A rapid turnaround time for PCB analysis will be utilized for all verification sample analysis to minimize the time that the excavated area is required to remain open.

The strategy and sequencing for excavation and verification sampling of the soils, is as follows:

1) Remove and clear all miscellaneous surface debris in and around the areas to be excavated.

2) All source area soils will be excavated in two foot depth intervals to a depth of 8 feet bgs or until the removal of soils with PCB ≥50 mg/kg in three identified areas is verified to be complete, whichever is deeper. If all PCB≥50 mg/kg has been removed, verification sampling will not be performed and excavation will proceed to bedrock based on shoring requirements and dewatering but would not be constrained to 2 foot discreet intervals. .

3) Soils within Areas 1, 2 and 3 will be removed first and side wall samples will be collected to confirm removal of PCBs of greater than or equal to 50 mg/kg before continuing removal of additional soils to complete the two foot excavation in the source soil area.

4) Verification samples will be collected from the base to confirm removal of PCBs greater than or equal to 50 mg/kg from Areas 1, 2 and 3 only at discrete elevations based on historic and pre design sampling data.

Source area soils that contain concentrations of PCBs of greater than or equal to 50 mg/kg will be excavated from Areas 1, 2 and 3 first and placed on the staging pad where they will be temporarily staged pending transfer off-Site for disposal. Overlying soil (0-1 feet interval) with PCBs less than 50 mg/kg will be removed and handled as greater than 50 mg/kg material. Within Area 3, PCBs greater than or equal to 500 mg/kg were detected at 1-2 feet BGS and 7-8 feet BGS. At the aforementioned depth intervals, the excavation will completed so that the greater than or equal to 500 mg/kg PCBs will be excavated first and the soils placed in a roll off. These waste streams will be staged separately. In all cases, soils with PCBs greater than or equal to 50 mg/kg will be removed and verified before removing additional source soil within each 2 foot cut.

The staging pad will be lined and constructed in accordance with TSCA requirements. In general, it is anticipated that ≥50 mg/kg *PCB* material and <50 mg/kg PCB material will not be staged on the same pad at the same time. However, if this is required, the material will be kept separated on the pad. Any material becoming intermixed will be handled and disposed as ≥50 mg/kg PCB material. Staging of the excavated material will allow excess water to drain out of the material. This water will be collected in a sump on the pad, transferred to the treatment system, and treated.

OU-1 soils outside the source area will be removed to a depth of approximately 2 feet bgs or as necessary to allow construction of a 2 foot cover system consisting of clean imported fill and vegetated top soil.

6.8.6.2.1 Soil Verification Sampling Procedures

Verification sampling for ≥50 mg/kg PCB material will be performed in accordance with 40 CFR Part 761.61 Subpart O of the TSCA regulation.

A sampling grid will be laid out as shown on Drawing C-17. Each grid will be 25 square feet or less. Grids will typically be 5 feet by 5 feet unless the shape needs to be altered to follow excavation boundaries. If the excavation limit is extended beyond the limits of the grid by more than 2 feet, in each direction, an additional grid will be added to provide coverage for the additional area. Once excavation limits are reached, verification samples will consist of a composite sample collected from the top 4 inches of the ground surface at the nodes of each grid. Samples from grid nodes with the same number will be composited. A minimum of 3 composite samples will be required for each sub area (1, 2 or 3). If the composite results are less than 500 mg/kg or less than 50 mg/kg based on the specific targeted removal, then additional excavated material will be staged according to the expected PCB concentration in the underlying soils.

In areas where greater than or equal to 50 mg/kg materials are to be removed, one composite consisting of 2 samples spaced 2-feet apart will be collected for each 5 lineal feet of sidewall. All samples will be submitted for analysis on a rapid turnaround basis. If the composite results are less than 50 mg/kg, then additional excavated material will be staged as containing PCBs less than 50 mg/kg. Side wall samples will not be collected once excavation of Areas 1, 2 and 3 are completed.

If verification samples indicate all PCBs greater than or equal to 50 mg/kg (or 500 mg/kg where appropriate) have not been removed either horizontally or vertically, then additional excavation will occur. The extent of addition horizontal excavation will be determined by the Engineer based on historical soil boring sample data and new verification samples will be collected for analysis. For failures of the base of the excavation, an additional 2 feet of soil will be removed before repeating the verification sampling.

6.9 Solidification

The requirements for solidifying excavated sediments will be specified in the Technical Specifications. The Contractor will be required to submit a Sediment Solidification Plan to the Engineer for review and approval.

The objective of the solidification process will be to reduce the free water content in the sediment that will enable the material to pass a paint filter test (SW-846 Method 9095 and 9096 (Free Liquid) in order to meet acceptance requirements for disposal at off-Site disposal facilities. GHD anticipates that the majority of sediments will sufficiently dewater by gravity drainage to meet disposal requirements. Solidification is anticipated to be used on material which does not dewater effectively by gravity drainage or where it is beneficial to project execution to solidify materials to reduce the time necessary for dewatering.

If required, Canal sediment and Site soils will undergo physical solidification by adding a pozzolanic material (e.g., Portland cement, cement kiln dust). Solidification is typically conducted by placing the solidifying reagents on the sediment on a staging pad and mixing with an excavator bucket.

6.9.1 Bench Scale Studies

Bench scale testing has been completed to determine the effectiveness of solidification reagents in treating the sediments to allow them to pass the paint filter test. Sediments that do not dewater sufficiently will be stabilized with a reagent such as fly ash or cement kiln dust in accordance with the bench scale study recommendations discussed in Section 4.3.

The requirements for solidification are included in the solidification specifications.

6.9.2 Solidification QA/QC

After solidification, sediment/soil will be sampled and tested to ensure that the material will pass the paint filter test and disposal criteria, as required. Samples will be collected and analyzed at the frequency required by the selected disposal facilities. CQC/CQA inspections and testing will be conducted in accordance with Section 7.0.

6.10 Canal Restoration

The requirements for Canal restoration will be shown on the final Drawings and specified in the Technical Specifications. The objective of the Canal restoration will be to restore the Canal to a condition that is similar to existing pre-remediation conditions.

This section includes the measures to restore the sections of the Canal where sediment has been removed. These measures include the supply and placement of soil to restore the Canal bed if excavation depths extend to bedrock, and grading. Disturbed banks adjacent to the Site will be stabilized with topsoil, application of seed, and installation of erosion control measures.

In preparation for restoration work within the Canal, the Contractor will verify that survey bench marks and intended elevations for the works as shown on the Drawings are accurate.

The Contractor will be responsible for planning and providing equipment and services necessary to load, unload, stage (as necessary), handle, and transport the restoration materials such as clay, common fill, topsoil, seed and mulch using public roads.

Imported restoration material will be handled in a manner that will minimize double-handling (i.e., directly transported to the location of use) and maintain segregation between materials. Temporary stockpiles of restoration materials will be covered at the end of each day to withstand adverse weather, wind, and other detrimental forces. Surface water will be directed away from the temporary stockpile locations. Due to upland space constraints, clean restoration material may be stockpiled in the canal. This will allow front end loaders to access the restoration materials without coming onto OU-1. Following the restoration of the Canal bed, an approximate six-inch thick layer of topsoil will be placed on the Canal banks adjacent to the Site to coincide with the construction of the Site soil cover. Seed and straw mulch layer (to provide erosion control until the vegetation is established) will be applied once the topsoil is verified to meet design elevations.

During the Canal channel restoration, the Contractor will be required to perform survey activities to accurately record and identify layers of restoration material and to quantify volumes of placed material. The Contractor will be required to submit as-recorded information as requested by the Engineer to verify and approve elevations and quantities. Upon completion of construction activities, the Contractor will be required to submit a complete CQC as-recorded survey of the restoration and the Engineer will also conduct CQA verification of the CQC surveying.

6.11 OU1 and OU3 Source Soils Final Cover

The final component of the RA will be to install a 2 foot soil cover over the entire Site (OU1 and OU3 Source Soils inclusive). In order to do this and still maintain temporary facilities, the cover will be installed from east to west after removal of the OU1 soils. The OU3 upland source soil excavation will be backfilled to 2 feet below the final Site cover grade before the removal of surrounding OU1 soils begins. As OU1 soil is removed to the proposed subgrade elevations, the soils will be direct loaded onto trucks for disposal. Therefore, all the staging pads will be removed before this part of the RA begins.

The soil cover will be constructed of the following components:

- Demarcation layer 2 feet below the proposed surface elevation
- 1.5 feet of imported clean fill
- 0.5 feet of imported topsoil

The demarcation layer will consist of geotextile or other suitable readily identifiable separation layer. The cover soil will be dumped at the entrance to the Site and pushed back in layers across the Site. All equipment will remain on clean soils. Once completed the top soil will be hydro seeded. All imported soils for the cover will be tested in accordance with DER-10.

6.12 Transportation and Disposal

The requirements for off-Site transportation and disposal will be specified in the Technical Specifications.

6.12.1 Transportation

This section describes the procedures to be employed during the RA to ensure compliance with appropriate federal, state, and local regulations for transporting materials off-Site. This will ensure the following:

- Materials are transported in accordance with applicable laws and regulations.
- Potential impacted material is removed from the exterior of vehicles prior to moving from various active areas of the Site onto public rights-of-way or support areas of the Site.
- The impact upon local area traffic due to transportation of Site materials is minimized.
- A spill contingency plan is in effect during transportation.

A material tracking form will be used to track the movement of each load of excavated material after it leaves the support facility(s) for off-Site disposal. Transport vehicles appropriately licensed to transport designated materials will be utilized to transport material over public roads. Records will be kept at both the excavation and the staging area or disposal facility to ensure all loads arrive at the correct destination.

During transportation over public roads, the Contractor will ensure that the transportation is conducted in compliance with federal, state, and local regulations concerning shipping materials, including the following:

- The number for each transport vehicle/container is properly displayed.
- The received box of the transport vehicle/container is clean of loose debris or foreign material prior to loading.
- The receiving box or container will be lined with a minimum of one layer of 6-mil polyethylene sheeting continuous along the bottom and sides. The liner will be placed on the floor, run up the sides, and draped over the sideboards. The liner will be neatly pushed into the corners to prevent tearing during loading and transport. If the Contractor can demonstrate that the receiving box is of leak proof construction, an impermeable cover is placed over the container, and that the receiving box or container is made of materials which can be decontaminated, then the lining requirements may be waived.
- Materials will be loaded in a manner which will not damage the properly placed polyethylene liner.
- Following loading, the liner will be folded over the loaded materials prior to securing with an approved tarpaulin in a manner to prevent loss of materials or fugitive dust emissions.

Flag persons will be employed as necessary to ensure safe entrance to and exit from public roadways.

Prior to leaving the Site, each transport vehicle that has entered the exclusion zone will be decontaminated. The decontamination will be conducted to remove all material on the tires and axles and material on the vehicle resulting from loading operations. Transportation vehicles will also be decontaminated following off-loading at the on-Site staging area.

Material removed from the staging and dewatering facility will be transported directly to the off-Site disposal facility. The transportation route to and from the Site for waste materials is presented in Figure 6.2. Transport vehicles will be marked and placarded in accordance with applicable

regulations. All material transported off-Site for disposal will be manifested and bills of lading (BOLs) completed, as appropriate, and the signed manifests and BOLs tracked. A summary of all disposal documentation will be included in the Final Engineering Report. This will include waste characterization reports, waste profiles, manifests or bills of lading, disposal facility weigh tickets and/or confirmation of disposal or incineration.

6.12.2 Off-Site Disposal

Waste streams generated during the RA will include:

- Cleared and grubbed material from the Site
- Vegetation and debris removed from the Canal and Site prior to sediment/soil removal.
- Demolition debris (concrete), if required.
- Canal sediment and upland soils (OU1 and OU3 Source Soils).
- Personal protective equipment (PPE).
- Miscellaneous non-impacted refuse and debris.
- Impacted water from dewatering and water management.
- Water treatment media.

6.12.2.1 Cleared and Grubbed Material

All material generated from clearing and grubbing will be disposed off-Site.

6.12.2.2 Canal Vegetation and Debris

Vegetation and debris removed from the Canal remediation areas will be managed at the Sediment Management Facility. The material will be transported to a permitted off-Site disposal facility.

6.12.2.3 Demolition Debris

Demolition debris such as concrete or asphalt will be segregated according to recyclable or waste classification and disposed according to applicable regulations.

6.12.2.4 Sediment and Soil

Stockpiled Canal sediment and/or soil will be tested for waste characterization at a frequency required by disposal facilities. Analytical testing will include parameters required by applicable regulations and disposal facilities.

Contractor selected disposal facilities will be reviewed and approved by the Companies. GHD anticipates that the majority of sediment and soil will be characterized as non-hazardous and will be transported to permitted landfill that will accept PCBs < 50 mg/kg for disposal. Sediment and/or soil that is determined to be hazardous waste will be disposed in a RCRA Subtitle C landfill. Sediments and soils containing PCBs concentrations greater than or equal to 50 mg/kg or less than 500 mg/kg will be disposed as TSCA waste at a TSCA landfill. Sediment and soils containing PCB > 500 mg/kg will be incinerated at a licensed facility.

6.13 Air Quality Monitoring

Throughout the implementation of the RA activities, air monitoring will be conducted by the Contractor to ensure that the workers, are adequately protected, and applicable OSHA regulations are met. The Contractor's HASP will specify the type, frequency, sampling methods, and analytical protocols to be utilized by the Contractor to provide adequate protection. Ambient air will be field monitored for total dust and volatile organic compounds using methods and frequencies specified in the Contractor's HASP. Additional monitoring will be conducted during various work activities for PCBs and other parameters, and confined space monitoring, as appropriate.

If the concentration of total dust exceeds 150 µg/m^3, more stringent dust control measures will be implemented, or Site operations will be temporarily halted to consider alternate work practices.

The Community Air Monitoring Plan is detailed in the HASP requirements and provides measures to ensure that Site activities are controlled and stopped as needed to prevent potential impact to off-Site areas and the public. Community air monitoring will be conducted by the Engineer overseeing the work. This will involve monitoring upwind and downwind of active work areas and stockpiles at specific intervals. The action limits will be presented in the CAMP and will be included in the specifications with the Final Design. Monitoring will performed for dust, VOCs and PCBs.

6.14 Water Management

The requirements for water management will be shown on the Drawings and specified in the Technical Specifications.

6.14.1 Canal Dewatering

There are many advantages to performing the remedial work required in the Canal with the Canal in a dewatered state and also during the normal construction season (i.e. non-winter conditions). This would require maintaining the Canal in a dewatered state during the normal Canal navigation season. In order to do this, the portion of the Canal to be remediated would need to be isolated from the rest of the Erie Canal system and any water entering the work area from upstream sources (e.g. storm water outflows would have to be diverted around the work area.

Additional pre design work is required to determine to the NYSCC's satisfaction that blocking off this section of the Canal during the navigation season to allow sediment removal to occur in the dry will not impact the operation of Erie Canal locks E2 and E3 nor significantly change the water levels in the pool between those locks such that flooding occurs in the northern leg of the Canal within the Village of Waterford. During a meeting with the NYSDEC and the NYSCC on January 29, 2016, it was agreed to conduct a pilot test in cooperation with the NYSCC early in the 2016 navigation season when the locks are in operation. A work plan will be prepared to detail proposed methods of isolating the southern leg of the Canal to limit to the extent possible the hydraulic connection to the Erie Canal and to show monitoring locations in the Canal and the Erie Canal when lock E2 and E3 are operated. The NYSCC will prepare an operating plan for the test period to adjust the rates at which water is drained from lock E3 into the pool and water is taken from the pool to fill lock E2. Approximately 3,500,000 gallons of water is required in both locks to raise or lower the water elevation 34 feet. Under normal operations, this is done in 8 to 10 minutes. When that volume enters the pool from lock E3, the water levels the pool and the southern and northern legs of the Canal may rise. A bypass spillway around lock E2 has a control weir elevation of approximately 49 feet NAVD (NYSCC Record Drawings).

A work plan will be submitted to the NYSDEC and the NYSCC under separate cover. NYSCC has proposed conducting a test in late May 2016 to monitor water levels under various lock fill/drain operating scenarios. The results will be analyzed and submitted to NYSCC and NYSDEC and incorporated into the Final Remedial Design.

Water management requirements will be developed and presented in the Final Design based on these findings.

6.14.2 Water Handling

6.14.2.1 Waste Water Sources

Wastewater will be generated from the following activities:

- Canal excavations
- Soil excavation dewatering
- Sediment/soil dewatering at the Sediment Management Facility
- Equipment and vehicle decontamination
- Personal decontamination
- Miscellaneous sources that may be impacted

Wastewater generated will be pumped, collected, and transferred to the on-Site Wastewater Treatment Facility.

6.14.3 Wastewater Treatment Facility

The wastewater treatment requirements are specified on a performance basis (e.g., minimum collection, storage and hydraulic capacities, treatment capacity, and meeting discharge criteria on a batch basis). The performance-based specifications will provide the flexibility necessary to allow Contractors to propose the use of their own specialized equipment. At a minimum, treatment will include settling and filtration (e.g., bag filters and sand filters) to remove suspended solids, and activated carbon to provide polishing to remove dissolved organics.

The Contractor will be required to prepare a Wastewater Management Plan for review and approval by the Engineer. The plan will specify the components and the design for the treatment system and system operation in accordance with the Drawings and Technical Specifications. The Technical Specifications will specify that the Owner Permits and Approvals will provide discharge criteria and any other regulatory requirements related to wastewater treatment and management. Treated wastewater will be stored in tanks pending sampling and testing to confirm that the water meets permitted criteria for discharge.

The preliminary discharge criteria will be finalized as part of final Permit issuance.

As a contingency, water that cannot be treated on-Site to meet the discharge criteria may be transported off-Site for treatment/disposal.

6.15 Closeout and Final Soil Cover

At the completion of the remedial works, all temporary facilities and equipment will be decontaminated as required and removed and residual waste materials will be disposed off-Site. The soil cover on OU-1 will be completed when all temporary facilities and equipment are removed. Temporary erosion controls will be left in place until the soil cover has been successfully seeded and is stabilized.

Maintenance and monitoring of the Site post RA will be proposed in the Site Management Plan (SMP) prepared once the RA activities completed. Site fencing, groundwater monitoring requirements, soil cover inspections and maintenance will be included in the SMP

7. Construction Quality Assurance (CQA) Program

The Construction Quality Assurance (CQA) Program forms part of the remedial activities. The technical specifications provide the detailed inspection and testing required for the Construction Quality Control (CQC) program for the remedial construction activities. The CQA Program is designed to provide comprehensive review of all CQC activities as well as independent third party Engineer inspections and testing to verify that the CQC program is implemented in accordance with the Technical Specifications. A Construction Quality Assurance Project Plan (CQAPP) provides details on how CQA/CQC will be implemented, project organization and responsibilities, and summarizes requirements.

7.1 Purpose and Organization of CQA Program

The CQA Program presents the quality assurance program to be used during implementation of the RA activities. The purpose of the CQA Program is to ensure that the RA activities meet or exceed all design objectives and criteria, plans, and specifications and that the Contractor's Quality Control (QC) program is performed as required by the approved RD.

7.2 Project Description

The CQA Program applies to all RA construction activities. The major construction components of the RA for the Site include the following:

i. Site preparation

ii. Clearing of vegetation

iii. Clearing debris from the Canal

iv. Temporary cofferdam(s) in the Canal

v. Canal sediment removal

vi. Upland soil removal

vii. Staging/Solidification Facility

viii. Sediment/soil transportation and off-Site disposal

ix. Water Treatment Facility

x. Restoration activities

xi. Closeout

Detailed CQC inspection and testing requirements are provided throughout the Technical Specifications and are summarized in the CQAP.

7.3 QA Inspection and Testing Activities

7.3.1 Scope

Throughout the RA, there will be ongoing field inspections and testing requirements for specific work tasks. The field inspection and testing activities will ensure compliance with the RD as presented in this report, the design specifications and drawings, including ensuring completion of the activities in accordance with the QA/QC requirements.

Field inspections and field testing and off-Site geotechnical and chemical laboratory testing will provide qualitative and quantitative means of monitoring the quality and progress of work performed.

The components of each major work task that will require CQC/CQA field inspection or testing are as follows:

i. Construction Facilities and Temporary Controls

- Site support area
- personnel and equipment decontamination facilities
- Sediment/Soil Management Facility
- Wastewater Treatment Facility
- Erosion and Sediment Controls

ii. Canal Sediment/Soil Removal

- Sediment and erosion controls
- Clearing and grubbing
- Cofferdams and diversions
- Sediment removal and solidification
- Soil excavation
- Treatment, sampling, and discharge of wastewater
- Sediment/soil characterization sampling
- Verification sampling and analyses
- Loading, transportation, and off-Site disposal of sediment/soil

iii. Other Activities

- Health and Safety
- Surveying
- Restoration

7.3.2 Field Inspections

Field inspections will be completed throughout construction by the Engineer, CQA Officer and/or CQA support personnel.

The CQA Officer has the primary responsibility for performing and documenting all QA inspection activities. The CQA Officer may delegate certain tasks to support personnel, if prior approval from the Engineer is obtained.

The inspections will examine the following:

- Quality of workmanship
- Conformance of materials with specifications
- Conformance with specified lines, grades, and elevations
- Conformance with specified material quantities and thicknesses
- Conformance with required handling procedures

Documentation of all QA inspection activities will be included in the CQA Officer's log book. Specific observations and results will be documented and attached to the Daily Construction QA Reports.

Any inspection failures, conformance problems, or other concerns will be reported immediately to the Engineer.

The specific inspection activities, frequencies, conformance standards, and documentation requirements are summarized in the CQAPP tables. The Engineer or designated representative will conduct inspections as required to review and verify that RA construction activities are being conducted in accordance with the RA.

7.3.3 Testing

In addition to the above mentioned inspections, field and laboratory testing will be performed to ensure compliance with material specifications, performance standards, and design criteria.

The CQA Officer has the primary responsibility for conducting and documenting all QA testing activities. The CQA Officer may delegate certain tasks to support personnel, if prior approval from the Engineer is obtained.

Documentation of all QA testing activities will be included in the CQA Officer's log book. Testing results will be documented and attached to the Daily Construction QA reports.

Any test failures, performance problems, or other concerns will be reported immediately to the Engineer.

The specific testing activities, methods, frequencies, performance standards, and documentation requirements are summarized in the CQAP tables.

7.4 CQA Documentation

7.4.1 General

This section describes the documentation requirements for the CQA activities. The proper, thorough, and accurate documentation of all CQA activities is important to verify that the RA was completed according to the plans and specifications.

CQA documentation will consist of daily records, construction problem identification and resolution reports, photographic records, design and specification revisions, weekly construction meeting minutes, construction progress reports, and a final report. All records will be maintained at the Site by the CQA Officer, and copies submitted to the Engineer.

7.4.2 Daily Records

At a minimum, daily records will consist of field notes, summaries of daily meetings with the RA Construction Contractor, observation and data sheets, and construction problem and resolution reports.

The CQA Officer will record daily QA activities on observation and data sheets. The observation and data sheets will include the following information:

- Date, time, and weather conditions.
- Exceedances of air monitoring action levels and/or any changes to PPE levels.
- Description of ongoing construction and inspection activities.
- A reduced scale Site plan showing work areas, including test locations for each work day.
- A summary of test results identified as passing or failing; or in the event of a failed test, retest results.
- Test equipment calibrations, if applicable.
- Off-Site materials received and approvals given.
- A summary of decisions regarding acceptance of the work and/or corrective actions taken.
- Submittals made by suppliers verifying material quality.
- CQC and CQA quality control test and inspection results.
- Construction delays/causes and areas affected.
- QC/QA personnel on-Site.
- QA equipment on-Site.
- Record of instructions given by the Engineer.
- Record of changed conditions/conflicts encountered.
- Contractor's crew size, equipment, and hours worked.
- Signature of CQA Officer.

7.4.3 Construction Problem/Corrective Action Reports

This report will identify and document construction problems such as deficient QC/QA inspections and testing results and other problems and the necessary corrective actions to be taken. The purpose of the Construction Problem/Corrective Action Report is to document problems that will result in rework to meet the limits and criteria defined in the specifications or by the judgment of the CQA Officer or Engineer. At a minimum, this report will include the following information:

- Detailed description of the problem.
- Location and likely cause of the problem.
- How and when the problem was identified.
- Estimation of how long the problem has existed.
- Plan for corrective action.
- Description of the implementation of the corrective action.
- Verification and effectiveness of the corrective action.
- Suggested methods to prevent similar problems.
- Signature of CQA Officer.

7.4.4 Work Change Procedure

The Work Change Procedure will be implemented if a significant change in the design is required during construction. The Work Change Procedure will be as follows:

- Detailed description of reason for work change.
- Detailed description of work change, including specifications, design drawings, and CQA information, as required.
- Submission of work change to the Companies.
- Implement work change after receiving approval.

7.4.5 Photographs

A photographic record of construction activities, including significant problems and corrective actions will be maintained by the CQA Officer. Photographs will be identified by location, time, date, and individual photographer. One copy of the photographs will be given to the Engineer on a weekly basis, or more frequently if necessary. The CQA Officer will also keep a complete set of photographs at the Site.

7.4.6 Weekly Progress Reports

The CQA Officer will prepare weekly progress reports summarizing construction and CQC/CQA activities. The report will be submitted to the Engineer and will be included in progress meeting minutes for distribution. At a minimum, weekly progress reports will include the following information:

- Date, project name, and location.
- Summary of work and CQC/CQA activities for the week.

- Summary of deficiencies and/or defects and resolutions.
- Signature of CQA Officer.

The CQA Weekly Report will be provided and discussed at the weekly construction meeting and included as an attachment to the weekly construction meeting minutes.

7.4.7 Weekly Construction Meetings

Weekly construction meetings will be held to discuss health and safety, construction progress, CQC/CQA activities and results, problems, and corrective actions. The Engineer will record and distribute the minutes of the meeting. At a minimum, weekly construction meeting minutes will include the following information:

- Date, project name, and location.
- Health and safety.
- Schedule.
- Summary of work and progress.
- CQC/CQA activities for the week.
- Summary of deficiencies and/or defects and resolutions.
- Other issues and actions.

7.4.8 Final Report

Upon completion of the Remedial Action construction, the CQA Officer will submit a report to the Engineer that summarizes the CQA activities performed during the construction. The report will contain, at a minimum, the following information:

- Summary of all quality assurance activities.
- Complete set of observation and data sheets and field notes.
- Complete set of construction problem/corrective action reports.
- Complete set of construction photographs.
- Sampling, inspection, and testing location plans and results.

7.4.9 Final Engineering Report

Upon completion of remedial construction activities, A Final Engineering Report will be prepared and submitted to NYSDEC. The Final Engineering Report will include detailed documentation of the construction activities, CQC/CQA inspections and testing activities, any significant design modifications, and as-recorded drawings. The Final Engineering Report will follow the generic template established by NYSDEC for State run Inactive Hazardous Waste Site Program .

7.4.10 Storage of Records

During construction, the Contractor and Engineer will maintain on-Site copies of the plans and specifications and any construction reports and CQC documentation submitted by the Contractor. The CQA Officer will maintain on-Site copies of the CQC/CQA documentation.

8. Project Plans

8.1 Health and Safety Plan (To Be Prepared for Final Design)

A Site-specific Health and Safety Plan (HASP) is required to ensure that all remedial activities are performed safely and in accordance with applicable regulatory requirements, and that all persons, the general public, and the environment are protected from exposure to Site-related contaminants. The health and safety requirements for the remedial activities will be developed in accordance with 29 CFR 1910. The HASP includes:

- General requirements.
- Personnel.
- Levels of protection.
- Safe work practices and safeguards.
- Medical surveillance.
- Personal and environmental air monitoring.
- Personal protective equipment.
- Personal hygiene.
- Decontamination of personnel and equipment.
- Site work zones.
- Contaminant control.
- Contingency and emergency planning.

A Community Air Monitoring Plan (CAMP) will be included an attachment to the HASP. The CAMP will be implemented in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan for VOCs, fugitive dust and particulate monitoring. The HASP will be presented in the Final Design.

8.2 Waste Management Plan (To Be Prepared for Final Design)

The Waste Management Plan describes the procedures and protocols for the handling of materials generated throughout remediation activities, which includes construction, dewatering and excavation activities. The Waste Management Plan will be presented in the Final Design.

The types of wastes that may be generated include, but may not be limited to the following:

- Aqueous waste.
- Solid waste (e.g., drill cuttings, personal protective equipment).
- Impacted soil and sediment
- The overall objectives included in the Waste Management Plan are to:
    - Minimize the quantity of waste generated and requiring off-Site disposal.
    - Prevent the agglomeration of unique waste streams.

- Ensure wastes are properly managed on-Site to prevent unmitigated releases to the environment or contamination of otherwise clean areas of the Site.
- Manage all wastes in accordance with applicable regulations.
- Odor Control.

The procedures and protocols outlined in the Waste Management Plan include proper management, characterization testing/sampling, treatment, and transportation and/or disposal of wastes generated during the remediation process. These procedures will be performed in conjunction with those presented in the Health and Safety Plan. The Waste Management Plan may be revised and/or expanded as appropriate as the remediation work progresses. Such revisions may include additional information, or a modification to methodologies and procedures associated with any changes in work scope and/or Site conditions.

8.3 Verification Sampling Plan (To Be Prepared for Final Design)

Verification sampling is described in Section 6.8.7. The Verification Sampling Plan will be presented in the Final Design.

8.4 Construction Quality Assurance Project Plan (QAPP) (To Be Prepared for Final Design)

The Construction Quality Assurance Project Plan (QAPP) provides the quality assurance, quality control, and chain of custody procedure used for sampling/monitoring, and analysis, and data assessment. The QAPP will be presented in the Final Design

8.5 Risk Management Plan (To Be Prepared for Final Design)

9. Permits and Approvals

The following approvals will be required before permits can be obtained:

1. NYSDEC approval of the remedial design
2. USEPA approval of the verification sampling plan for TSCA regulated material

Applications will be completed and the substantive requirement for the following permits will be met, as appropriate:

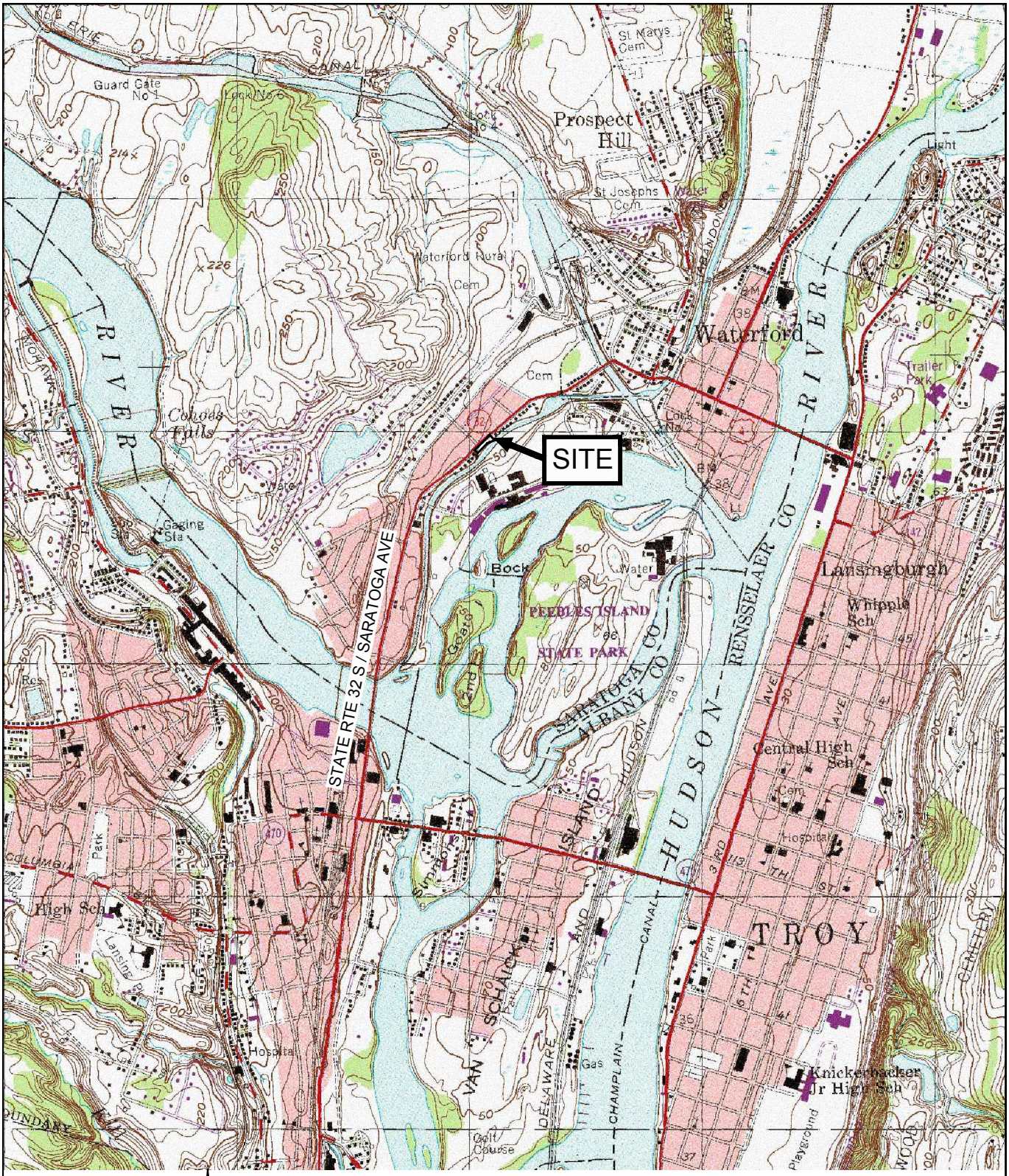
1. NYSCC Canal Access Permit – for work in the Old Champlain Canal
2. U.S. Army Corps of Engineers Nationwide Permit 38 –for placement of dredged or fill material in a Waters of the US as required under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act
3. Section 401 NYSDEC Water Quality Certificate – for work within a stream, pond or navigable water way
4. Article 24 Freshwater Wetlands Permit – for work within a NYSDEC regulated wetland
5. Article 15 Permit – for excavation and /or placement of fill next to a river
6. Town of Waterford sanitary discharge permit (if applicable)

In conjunction with the Nationwide permit application, information will have to be provided on endangered species, critical habitats and cultural resources that occur in the work area. A Stormwater Pollution Prevention Plan and drawings showing work areas and restoration plans will also be provided.

The upland portion of the Site is very small and it will be difficult to implement and support a remediation project of this size using only the Site property. Therefore, access to other properties in the vicinity of the Site may be necessary in order to implement the remedy. During the Final Design phase, access and support areas will be further evaluated and potential properties in the area that could be used to support the remediation will be identified. The Companies will initiate discussions with any identified property owners to assess the possibility of securing access to the property to support the remediation.

10. Remedial Design Schedule

A preliminary schedule showing the completion of the design is presented in Figure 10.1.



USGS QUADRANGLE MAP
NORTH TROY, NEW YORK

figure 1.1

SITE LOCATION
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave., Waterford, N.Y.

80987-20(007)GN-WA001 FEB 24/2016

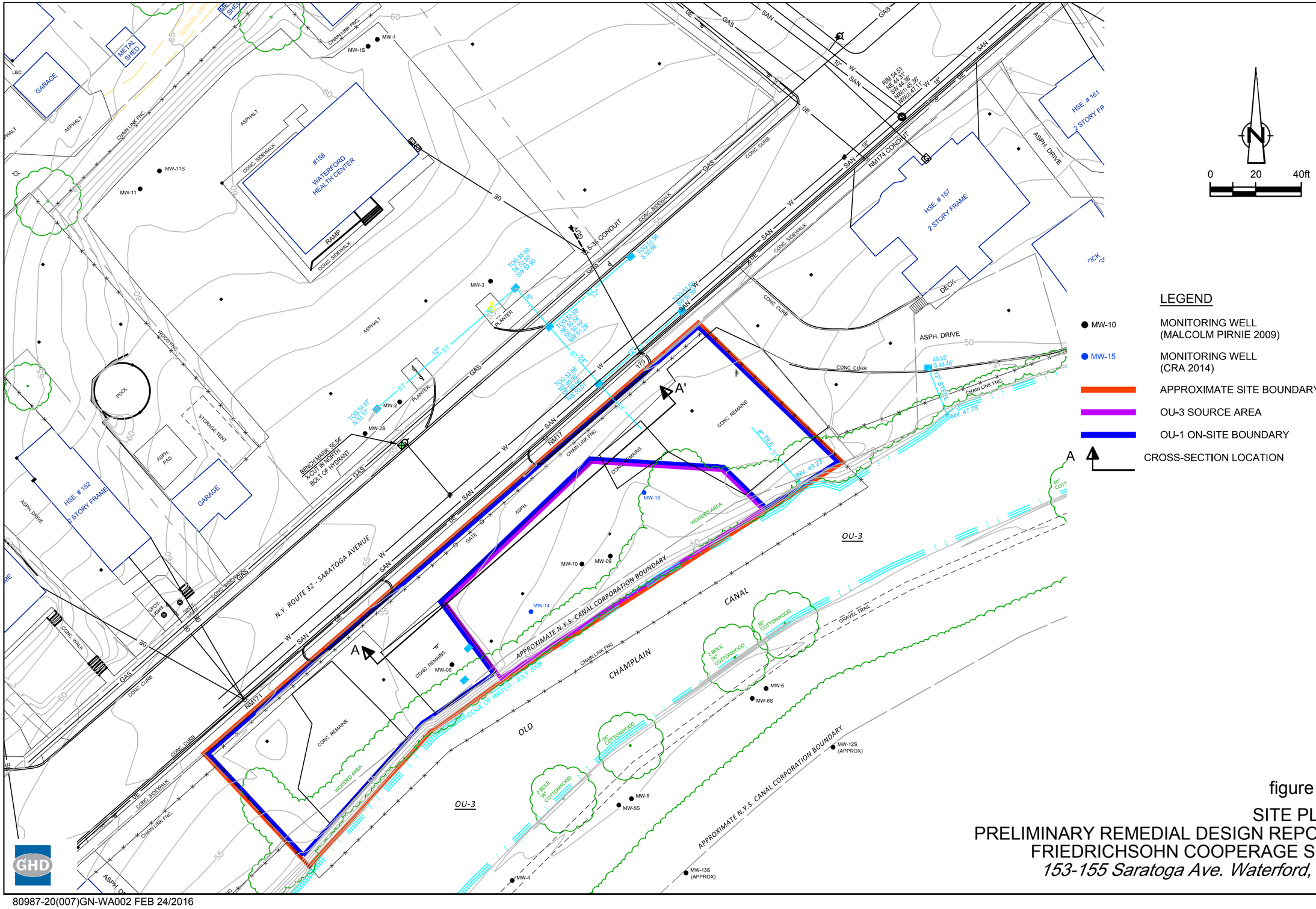


figure 2.1

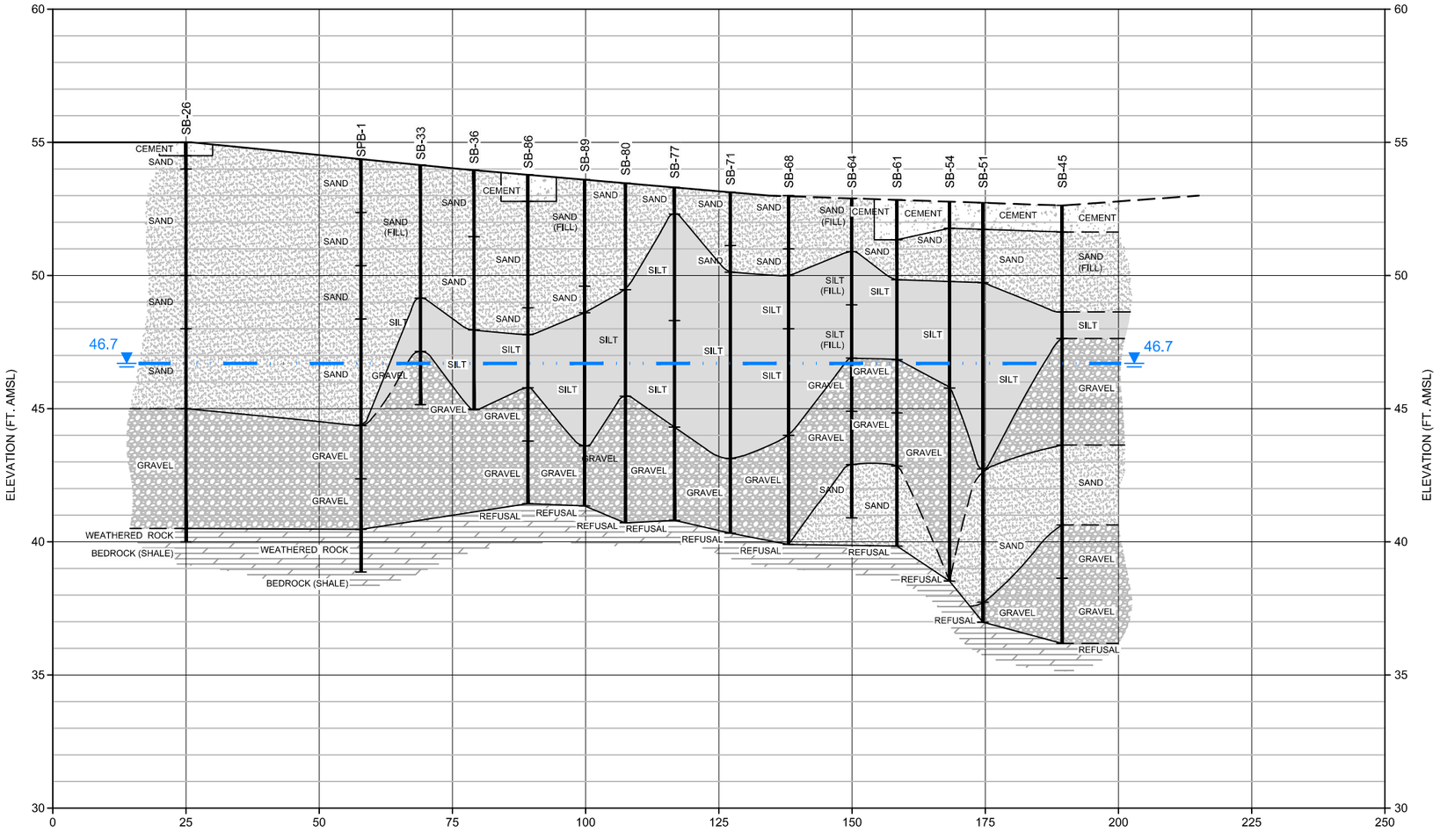
SITE PLAN
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, NY

A

SOUTHWEST

A'

NORTHEAST



HORZ. SCALE: 1" = 25'
VERT. SCALE: 1" = 5'

LEGEND

SB-26 — BORING DESIGNATION

GROUND SURFACE

BORING INSTALLATION

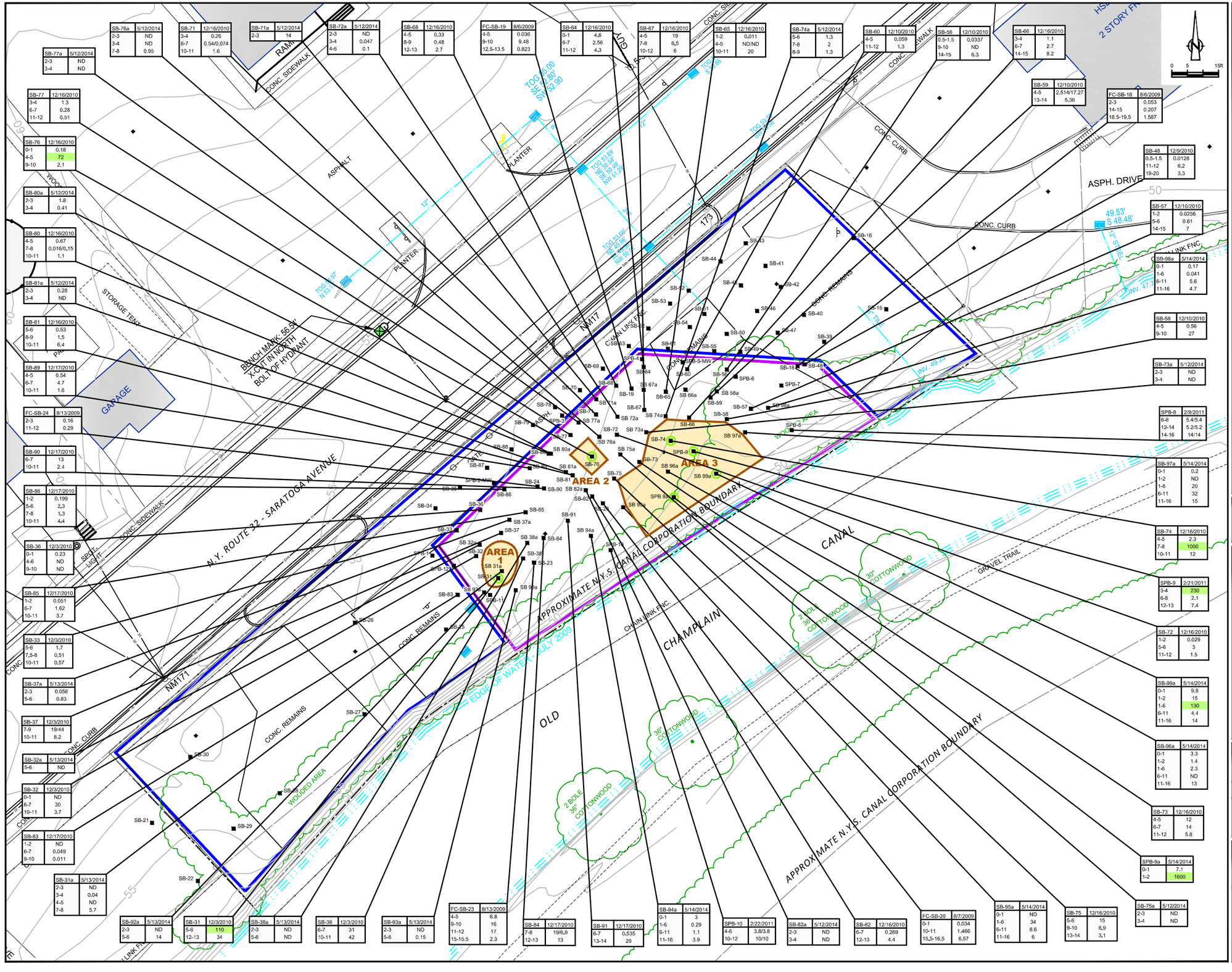
GRAVEL — STRATIGRAPHIC DESCRIPTION

BOTTOM OF BORING

46.7 — JULY 2014 GROUNDWATER ELEVATION (APPROX.)

figure 2.2

CROSS-SECTION A-A'
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, NY



SB-76a	5/12/2014
2-3	ND
3-4	ND
7-8	0.95

SB-71	12/16/2010
3-4	0.26
6-7	0.54/0.074
10-11	1.6

SB-71a	5/12/2014
2-3	14

SB-72a	5/12/2014
2-3	ND
3-4	0.047
4-5	0.1

SB-68	12/16/2010
4-5	0.33
8-9	0.48
12-13	2.7

FC-SB-19	8/6/2009
4-5	0.036
9-10	9.48
12.5-13.5	0.823

SB-64	12/16/2010
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11-12	4,3

SB-67	12/16/2010
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10-12	6

SB-65	12/16/2010
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4-5	ND/ND
10-11	20

SB-74a	5/12/2014
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7-8	2
8-9	1,3

SB-60	12/10/2010
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11-12	1,3

SB-56	12/10/2010
0.5-1.5	0.0337
9-10	ND
14-15	6.3

SB-66	12/16/2010
3-4	1.1
6-7	2.7
14-15	8.2

SB-59	12/10/2010
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13-14	5.36

FC-SB-18	8/6/2009
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SB-48	12/9/2010
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SB-57	12/10/2010
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SB-98a	5/14/2014
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11-16	4.7

SB-58	12/10/2010
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9-10	27

SB-73a	5/12/2014
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3-4	ND

SPB-8	2/9/2011
6-8	5.4/5.4
12-14	5.2/5.2
14-16	14/14

SB-97a	5/14/2014
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11-16	15

SB-74	12/16/2010
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7-8	1000
10-11	12

SPB-9	2/21/2011
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6-8	2.1
12-13	7.4

SB-72	12/16/2010
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SB-99a	5/14/2014
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11-16	14

SB-96a	5/14/2014
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11-16	13

SB-73	12/16/2010
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6-7	14
11-12	5.8

SPB-9a	5/14/2014
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1-2	1600

SB-75a	5/12/2014
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3-4	ND

SB-77a	5/12/2014
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3-4	ND

SB-77	12/16/2010
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SB-76	12/16/2010
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SB-80a	5/12/2014
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SB-80	12/16/2010
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SB-81a	5/12/2014
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SB-81	12/16/2010
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10-11	6.4

SB-89	12/17/2010
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10-11	1.6

FC-SB-24	8/13/2009
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SB-90	12/17/2010
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10-11	2.4

SB-86	12/17/2010
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7-8	1,3
10-11	4,4

SB-36	12/3/2010
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9-10	ND

SB-85	12/17/2010
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10-11	3.7

SB-33	12/3/2010
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10-11	0,57

SB-37a	5/13/2014
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SB-37	12/3/2010
7-9	19/44
10-11	8.2

SB-32a	5/13/2014
5-6	ND

SB-32	12/3/2010
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10-11	3,7

SB-83	12/17/2010
1-2	ND
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9-10	0.011

SB-31a	5/13/2014
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4-5	ND
7-8	5.7

SB-92a	5/13/2014
2-3	ND
5-6	14

SB-31	12/3/2010
5-6	110
12-13	34

SB-38a	5/13/2014
2-3	ND
5-6	ND

SB-38	12/3/2010
6-7	31
10-11	42

SB-93a	5/13/2014
2-3	ND
5-6	0.15

FC-SB-23	8/13/2009
4-5	6.8
9-10	16
11-12	17
15-15.5	2.3

SB-84	12/17/2010
7-8	19/6,9
12-13	13

SB-91	12/17/2010
6-7	0,535
13-14	20

SB-94a	5/14/2014
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SPB-10	2/22/2011
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10-12	10/10

SB-82a	5/12/2014
2-3	ND
3-4	ND

SB-82	12/16/2010
6-7	0.269
12-13	4.4

FC-SB-20	8/7/2009
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SB-95a	5/14/2014
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11-16	6

SB-75	12/16/2010
5-6	15
9-10	8,9
13-14	3,1

SB-22	5/13/2014
2-3	ND
3-4	0.04
4-5	ND
7-8	5.7

No	Revision	Date	Initial

LEGEND

- SB-77 — SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 75 — SOIL BORING LOCATION (CRA, 2014)
- APPROXIMATE SITE BOUNDARY
- OU-3 SOURCE AREA
- OU-1 ON-SITE BOUNDARY
- >50 ppm TSCA EXCAVATION LIMIT

AREA 1 = 131 ft²
AREA 2 = 69 ft²
AREA 3 = 965 ft²

SB-82 | 12/16/2010 | 6-7 | 0,269 | 12-13 | 4,4

SAMPLE ID
SAMPLE DATE
CONCENTRATION (mg/kg)
SAMPLE DEPTH (ft BGS)
ND = NOT DETECTED
\- = NOT SAMPLED
>50ppm TSCA LIMIT

NOTES
- PCB SOIL RESULTS ARE PRESENTED IN mg/kg OR ppm
- TSCA - TOXIC SUBSTANCE CONTROL ACT

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave., Waterford, N.Y.

PRELIMINARY REMEDIAL DESIGN REPORT

PCB SOIL ANALYTICAL RESULTS (OU-3 SOURCE AREA)

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. JOSEPH	NOVEMBER 2014	
Scale: AS SHOWN	Project No: 80987-20	Report No: 007	Drawing No: figure 3.1

80987-20(007)GN-WA004 FEB 24/2016

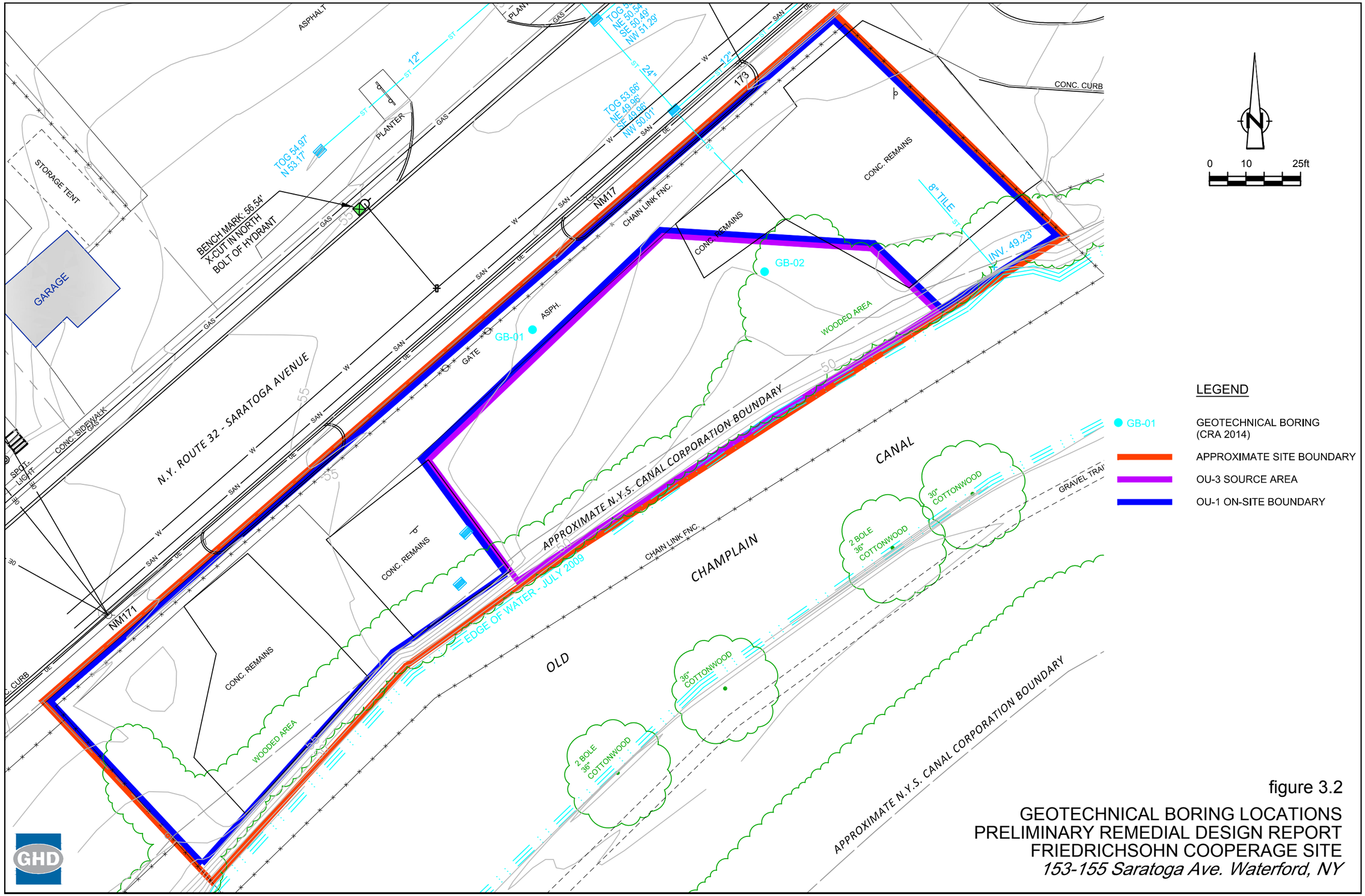


figure 3.2

GEOTECHNICAL BORING LOCATIONS
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, NY

80987-20(007)GN-WA020 FEB 25/2016

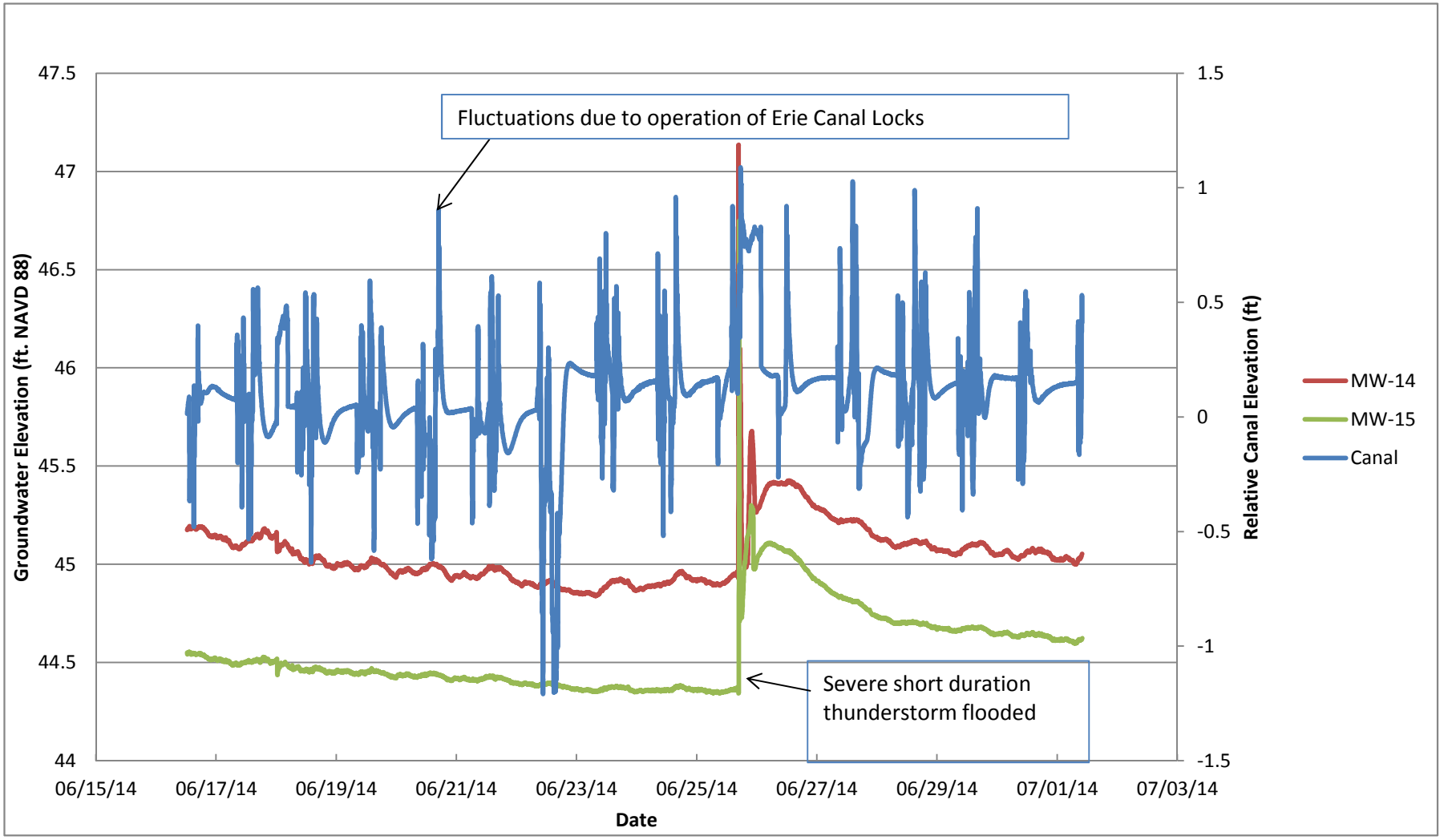


figure 3.3

Groundwater Levels - June 16, 2014 to July 1, 2014
Preliminary Remedial Design Report
Friedrichsohn Cooperage Site
Waterford, NY

MW-10	Class GA	10/8/2009	6/6/2014
Metals			
Antimony	3	14 J	5.1 J/4.8 J
Arsenic	25	168	64.9/63.5
Beryllium	3	7.82	ND(20)/ND(20)
Chromium	50	197	63.8/60.8
Copper	200	138	204 J/199 J
Iron	300	9920	15800 J/13900 J
Lead	25	321	185 J/179 J
Manganese	300	589	973/859
Mercury	0.7	1.03 J	0.58/0.58
Nickel	100	626	225 J/218 J
Selenium	10	45.4	ND(100)/ND(100)
Sodium	20000	ND(1000)	2050000/2030000
PCBs			
Total PCBs	0.09	2200	23/190
SVOCs			
2,4-Dimethylphenol	50	11000 D	12000/15000
bis(2-Ethylhexyl)phthalate (DEHP)	5	110 J	ND(100)/ND(100)
Naphthalene	10	ND(1000)	60 J/44 J
Phenol	1	80000 D	13000/14000
VOCs			
Acetone	50	1800	ND(1000)/ND(1000)
Benzene	1	190	ND(1000)/120 J
Chlorobenzene	5	170	ND(1000)/140 J
Ethylbenzene	5	5400	2900/3000
Isopropyl benzene	5	73 J	ND(1000)/ND(1000)
o-Xylene	5	4900	2500/2600
Styrene	5	120	ND(1000)/ND(1000)
Tetrachloroethene	5	86 J	ND(1000)/ND(1000)
Toluene	5	25000 D	21000/21000
Trichloroethene	5	240	230 J/230 J
Xylenes (total)	5	-	11000/11000

MW-15	Class GA	6/6/2014
Metals		
Iron	300	29200 J
Lead	25	42.4 J
Manganese	300	7590
Sodium	20000	398000
PCBs		
Total PCBs	0.09	4.8
SVOCs		
2,4-Dimethylphenol	50	78 J
Phenol	1	28 J
VOCs		
1,2-Dichlorobenzene	3	16
1,2-Dichloroethane	0.6	1.9 J
1,4-Dichlorobenzene	3	6.8
Benzene	1	15
Chlorobenzene	5	43
cis-1,2-Dichloroethene	5	330
Ethylbenzene	5	92
o-Xylene	5	87
Toluene	5	560
trans-1,2-Dichloroethene	5	9.2
Trichloroethene	5	5.4
Vinyl chloride	2	130
Xylenes (total)	5	330

PES-1	Class GA	6/6/2014
Metals		
Antimony	3	1.5 J
Arsenic	25	92.7
Barium	1000	1920
Iron	300	240000 J
Lead	25	80.1 J
Manganese	300	5120
Sodium	20000	401000
PCBs		
Total PCBs	0.09	20000
SVOCs		
2,4-Dimethylphenol	50	1900
Phenanthrene	50	110
Phenol	1	2500
VOCs		
1,2-Dichloroethane	0.6	3.9 J
Acetone	50	290
Benzene	1	18
Chlorobenzene	5	8.6
cis-1,2-Dichloroethene	5	19
Ethylbenzene	5	74
o-Xylene	5	69
Toluene	5	660
Trichloroethene	5	13
Vinyl chloride	2	3.1 J
Xylenes (total)	5	250

MW-09	Class GA	10/8/2009
Metals		
Antimony	3	6 J
Arsenic	25	ND(10)
Barium	1000	1860
Iron	300	296
Lead	25	5.33 J
Manganese	300	87.2
Sodium	20000	225000
PCBs		
Total PCBs	0.09	ND
SVOCs		
2,4-Dimethylphenol	50	ND(11)
Phenanthrene	50	ND(11)
Phenol	1	ND(11)
VOCs		
1,2-Dichloroethane	0.6	ND(1)
Acetone	50	ND(5)
Benzene	1	ND(1)
Chlorobenzene	5	ND(1)
cis-1,2-Dichloroethene	5	ND(1)
Ethylbenzene	5	ND(1)
o-Xylene	5	ND(1)
Toluene	5	ND(1)
Trichloroethene	5	ND(1)
Vinyl chloride	2	ND(1)
Xylenes (total)	5	-

MW-14	Class GA	6/5/2014
Metals		
Iron	300	19800 J
Lead	25	67.5 J
Manganese	300	1240
Sodium	20000	549000
PCBs		
Total PCBs	0.09	120
SVOCs		
2,4-Dimethylphenol	50	120
Phenol	1	65
VOCs		
Acetone	50	60
Benzene	1	13
cis-1,2-Dichloroethene	5	14
Ethylbenzene	5	640
o-Xylene	5	540
Toluene	5	1400
Trichloroethene	5	13
Xylenes (total)	5	2200

0 10 25ft

LEGEND

- MW-10 — MONITORING WELL (MALCOLM PIRNIE 2009)
- MW-15 — MONITORING WELL (CRA 2014)
- APPROXIMATE SITE BOUNDARY
- OU-3 SOURCE AREA
- OU-1 ON-SITE BOUNDARY

MONITORING WELL ID — SAMPLE DATE

MW-14	Class GA	6/5/2014
Metals		
Iron	300	19800 J
Lead	25	67.5 J
Manganese	300	1240

PARAMETER — CONCENTRATION (µg/L)

- EXCEEDS CLASS GA GROUNDWATER STANDARDS
- 23/190 — PARENT RESULT/DUPLICATE RESULT
- - — NOT SAMPLED
- ND(10) — NOT DETECTED AT NOTED DETECTION LIMIT
- J — ESTIMATED VALUE

SOURCE:
NYSDEC BASE MAP

figure 3.4

GROUNDWATER DATA (OU-3 SOURCE AREA)
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, NY

80987-20(007)GN-WA007 FEB 24/2016

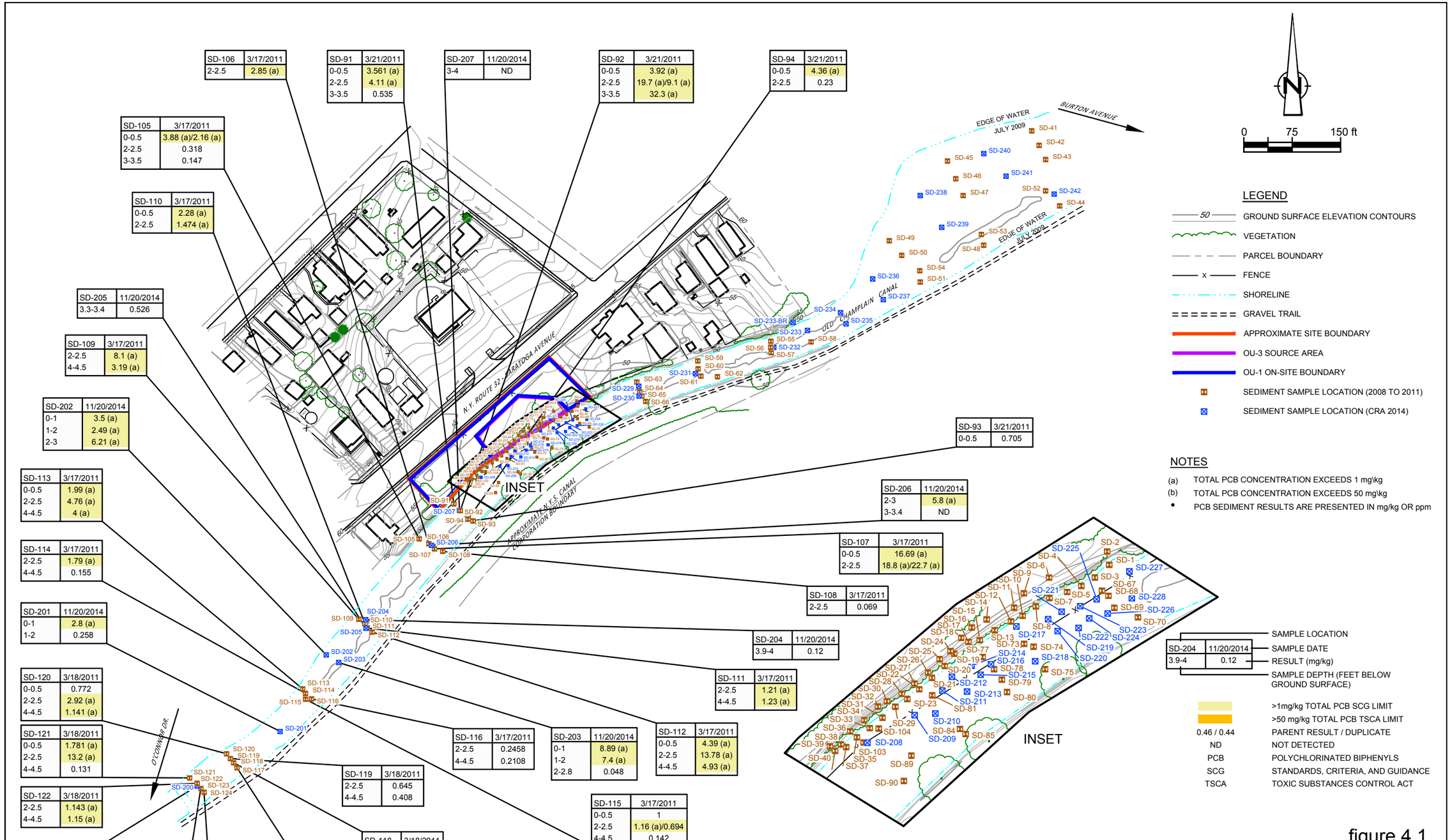


figure 4.1

PCB SEDIMENT ANALYTICAL RESULTS - UPSTREAM
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, NY

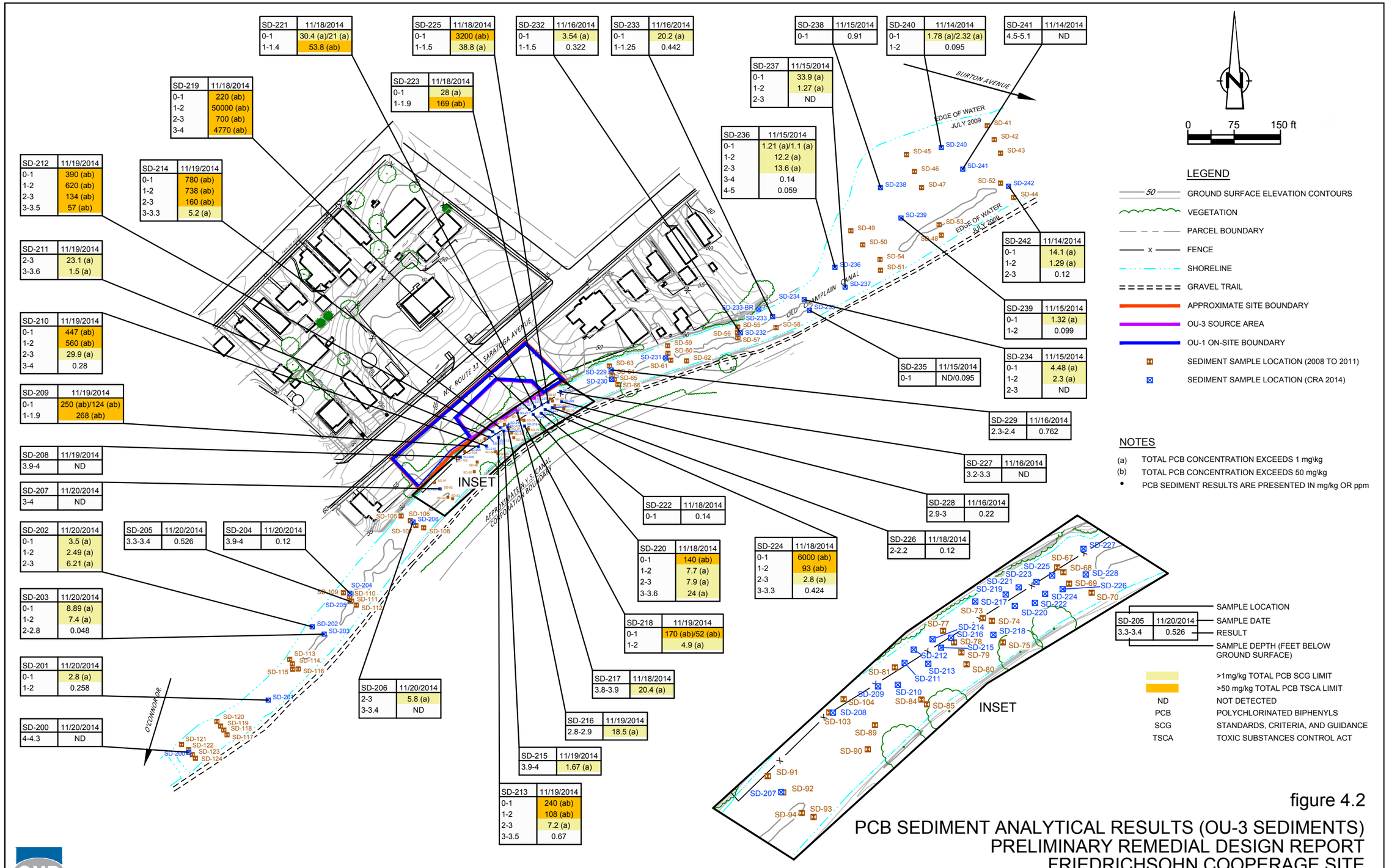


figure 4.2

PCB SEDIMENT ANALYTICAL RESULTS (OU-3 SEDIMENTS)
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE

153-155 Saratoga Ave. Waterford, NY

SD-238	11/15/2014
0-1	0.91

SD-49	2/23/2011
0-0.5	1.93 (a)/0.68
2-2.5	ND
4-4.5	ND

SD-54	3/22/2011
0-0.5	3.19 (a)
2-2.5	7.45 (a)
4-4.5	5.26 (a)

SD-236	11/15/2014
0-1	1.21 (a)/1.1 (a)
1-2	12.2 (a)
2-3	13.6 (a)
3-4	0.14
4-5	0.059

SD-233	11/16/2014
0-1	20.2 (a)
1-1.25	0.442

SD-55	3/22/2011
2-2.5	3.23 (a)
4-4.5	0.365

SD-56	3/22/2011
0-0.5	5.04 (a)
2-2.5	2.6 (a)

SD-59	3/22/2011
0-0.5	8.3 (a)
2-2.5	17.27 (a)/10.08 (a)
4-4.5	31.5 (a)

SD-60	3/22/2011
2-2.5	82.2 (ab)
3-3.5	11.77 (a)

SD-63	3/22/2011
2-2.5	49 (a)
4-4.5	10.74 (a)

SD-229	11/16/2014
2.3-2.4	0.762

SD-64	3/22/2011
0-0.5	3.493 (a)
2-2.5	5.85 (a)
4-4.5	13.1 (a)

SD-65	3/22/2011
2-2.5	14 (a)/6.53 (a)

SD-66	3/18/2011
0-0.5	0.2382
2-2.5	0.029
4-4.5	0.0516

SD-62	3/18/2011
2-2.5	ND

SD-61	3/22/2011
0-0.5	7.37 (a)
3-3.5	4.34 (a)

SD-57	3/22/2011
2-2.5	1.442 (a)
3-3.5	1.468 (a)

SD-47	2/22/2011
0-0.5	1.93 (a)
2-2.5	0.067
4-4.5	ND

SD-46	2/22/2011
0-0.5	4.2 (a)
2-2.5	ND
4-4.5	ND

SD-45	2/22/2011
0-0.5	0.347
2-2.5	0.35
4-4.5	ND

SD-241	11/14/2014
4.5-5.1	ND

SD-240	11/14/2014
0-1	1.78 (a)/2.32 (a)
1-2	0.095

SD-42	2/22/2011
0-0.5	0.34
2-2.5	1.7 (a)
4-4.5	0.47

SD-41	2/22/2011
0-0.5	0.54
2-2.5	1.4 (a)
4-4.5	0.66

SD-43	2/22/2011
0-0.5	2.54 (a)
2-2.5	1.5 (a)
4-4.5	0.11/0.17

SD-52	3/22/2011
0-0.5	9.09 (a)
2-2.5	16.95 (a)
4-4.5	4.27 (a)

SD-50	2/23/2011
0-0.5	1.69 (a)
2-2.5	0.57
4-4.5	ND

SD-44	2/23/2011
0-0.5	0.7
2-2.5	0.17

SD-242	11/14/2014
0-1	14.1 (a)
1-2	1.29 (a)
2-3	0.12

SD-48	2/23/2011
0-0.5	0.67
2-2.5	18 (a)
4-4.5	2.25 (a)

SD-51	2/23/2011
0-0.5	0.96
2-2.5	2.7 (a)
4-4.5	0.96

SD-53	3/22/2011
0-0.5	3.17 (a)
2-2.5	1.721 (a)
4-4.5	0.528

SD-237	11/15/2014
0-1	33.9 (a)
1-2	1.27 (a)
2-3	ND

SD-239	11/15/2014
0-1	1.32 (a)
1-2	0.099

SD-235	11/15/2014
0-1	ND/0.095

SD-234	11/15/2014
0-1	4.48 (a)
1-2	2.3 (a)
2-3	ND

SD-58	3/21/2011
0-0.5	0.349
1-1.5	0.071

SD-232	11/16/2014
0-1	3.54 (a)
1-1.5	0.322

EDGE OF WATER JULY 2009

BURTON AVENUE

N.Y. ROUTE 32 - SARATOGA AVENUE

OLD CHAMPLAIN CANAL

APPROXIMATE N.Y. CANAL CORPORATION BOUNDARY

O'CONNOR DR.

INSET

0 75 150 ft

LEGEND

- GROUND SURFACE ELEVATION CONTOURS
- VEGETATION
- PARCEL BOUNDARY
- FENCE
- SHORELINE
- GRAVEL TRAIL
- APPROXIMATE SITE BOUNDARY
- OU-3 SOURCE AREA
- OU-1 ON-SITE BOUNDARY
- SEDIMENT SAMPLE LOCATION (2008 TO 2011)
- SEDIMENT SAMPLE LOCATION (CRA 2014)

NOTES

(a) TOTAL PCB CONCENTRATION EXCEEDS 1 mg\kg

(b) TOTAL PCB CONCENTRATION EXCEEDS 50 mg\kg

• PCB SEDIMENT RESULTS ARE PRESENTED IN mg/kg OR ppm

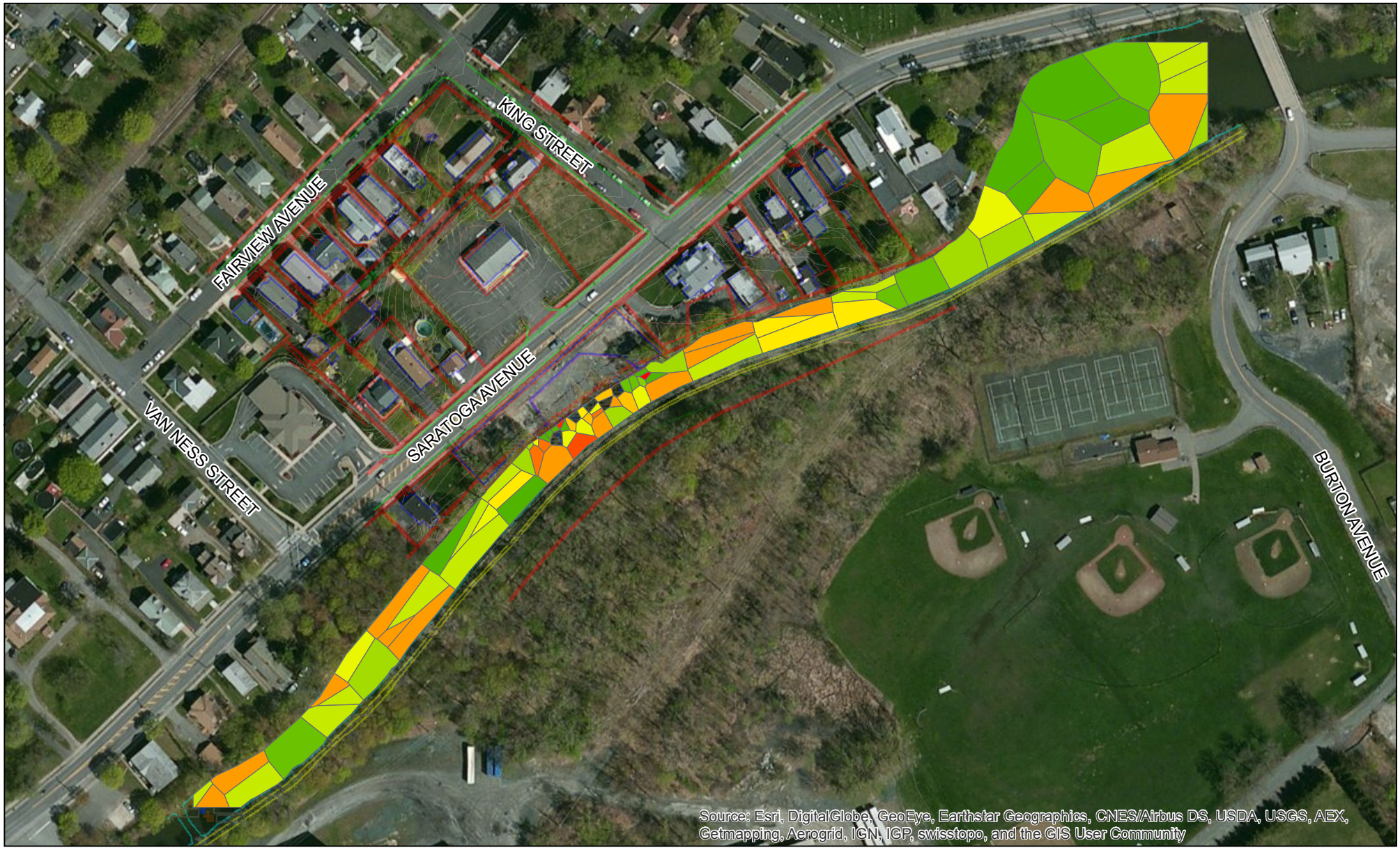
SD-238	11/15/2014
0-1	0.91

- SAMPLE LOCATION
- SAMPLE DATE
- RESULT
- SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

- >1mg/kg TOTAL PCB SCG LIMIT
- >50 mg/kg TOTAL PCB TSCA LIMIT
- 0.46 / 0.44 PARENT RESULT / DUPLICATE
- ND NOT DETECTED
- PCB POLYCHLORINATED BIPHENYLS
- SCG STANDARDS, CRITERIA, AND GUIDANCE
- TSCA TOXIC SUBSTANCES CONTROL ACT

figure 4.3

PCB SEDIMENT ANALYTICAL RESULTS - DOWNSTREAM
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, NY



Paper Size ANSI A

0 40 80 120 160 200

Feet

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane New York East FIPS 3101 Feet

N

LEGEND

Max Depth (Feet) > 1 to > 50 ppm PCB

0.0	1.5 - 2.0	3.5 - 4.0	5.5 - 6.0
0.1 - 0.5	2.0 - 2.5	4.0 - 4.5	6.0 - 6.5
0.5 - 1.0	2.5 - 3.0	4.5 - 5.0	
1.0 - 1.5	3.0 - 3.5	5.0 - 5.5	

GHD

Friedrichsohn Canal Works
Preliminary Remedial Design Report

Job Number 80987-40
Revision A
Date 23 Feb 2016

Friedrichsohn Cooperage Site
PCB Depth > 1 ppm

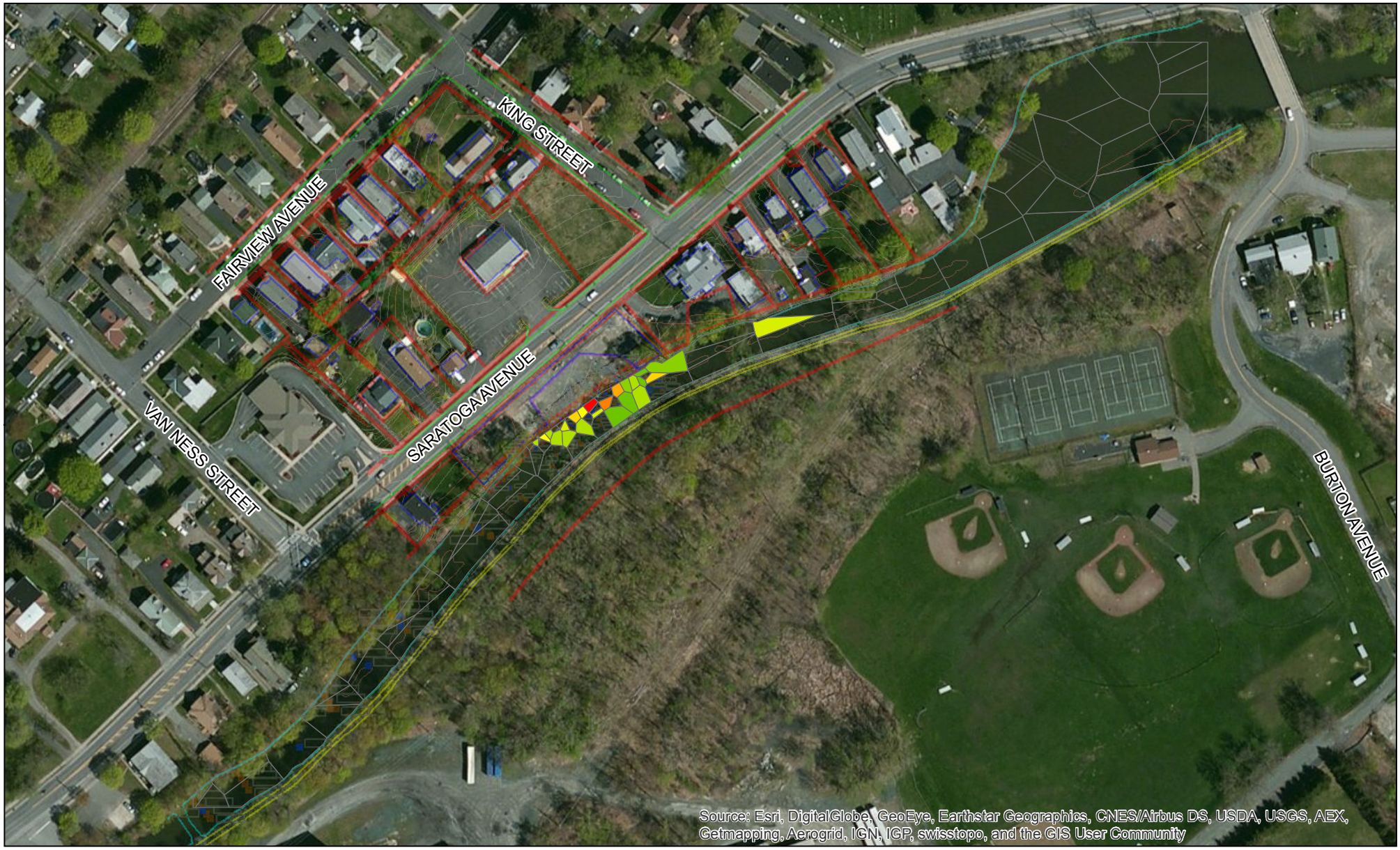
Figure 5.1

G:\88\12257\GIS\MXD\80987-40_PCB_Depth_1_to_50ppm.mxd

6705 Millcreek Drive, Mississauga, Ontario **T** 1 (905) 814-4378 **F** 1 (905) 890-8499 **E** ron.galos@ghd.com **W** www.ghd.com

© 2012. Whilst every care has been taken to prepare this map, GHD (and DATA CUSTODIAN) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Imagery - ESRI World Imagery, 2013; PCB Data, CRA, 2015. Created by:wabaldin



Paper Size ANSI A

0 40 80 120 160 200

Feet

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane New York East FIPS 3101 Feet

N

LEGEND

Max Depth (Feet)
> 50 ppm PCB

0.0 - 0.5	2.0 - 2.5	4.0 - 4.5
0.5 - 1.0	2.5 - 3.0	4.5 - 5.0
1.0 - 1.5	3.0 - 3.5	5.0 - 5.5
1.5 - 2.0	3.5 - 4.0	5.5 - 6.0

Friedrichsohn Canal Works
Preliminary Remedial Design Report

Job Number 80987-40
Revision A
Date 23 Feb 2016

Friedrichsohn Cooperage Site
PCB Depth > 50 ppm

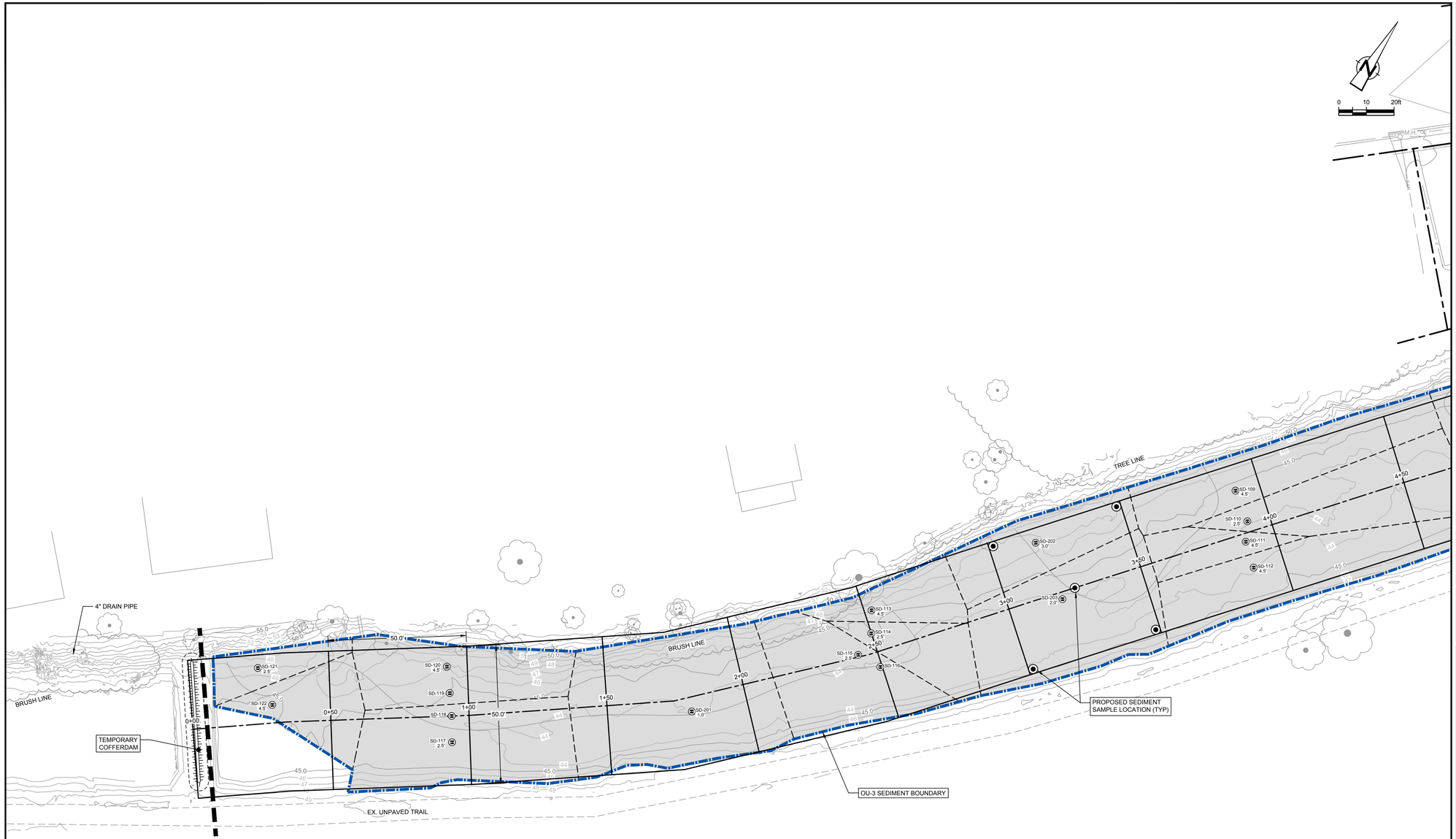
Figure 5.2

G:\88\12257\GIS\MXD\80987-40_PCB_Depth_50ppm.mxd

6705 Millcreek Drive, Mississauga, Ontario **T** 1 (905) 814-4378 **F** 1 (905) 890-8499 **E** ron.galos@ghd.com **W** www.ghd.com

© 2012. Whilst every care has been taken to prepare this map, GHD (and DATA CUSTODIAN) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Imagery - ESRI World Imagery, 2013; PCB Data, CRA, 2015. Created by:wabaldin



No	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 — EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- EXISTING SANITARY SEWER
- EXISTING TREE
- EXISTING ELECTRICAL OVERHEAD LINE
- SD-78 / 2.5' / 5.0' — SEDIMENT SAMPLE ID; 1# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<50ppm PCBs); 2# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<1ppm PCBs)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

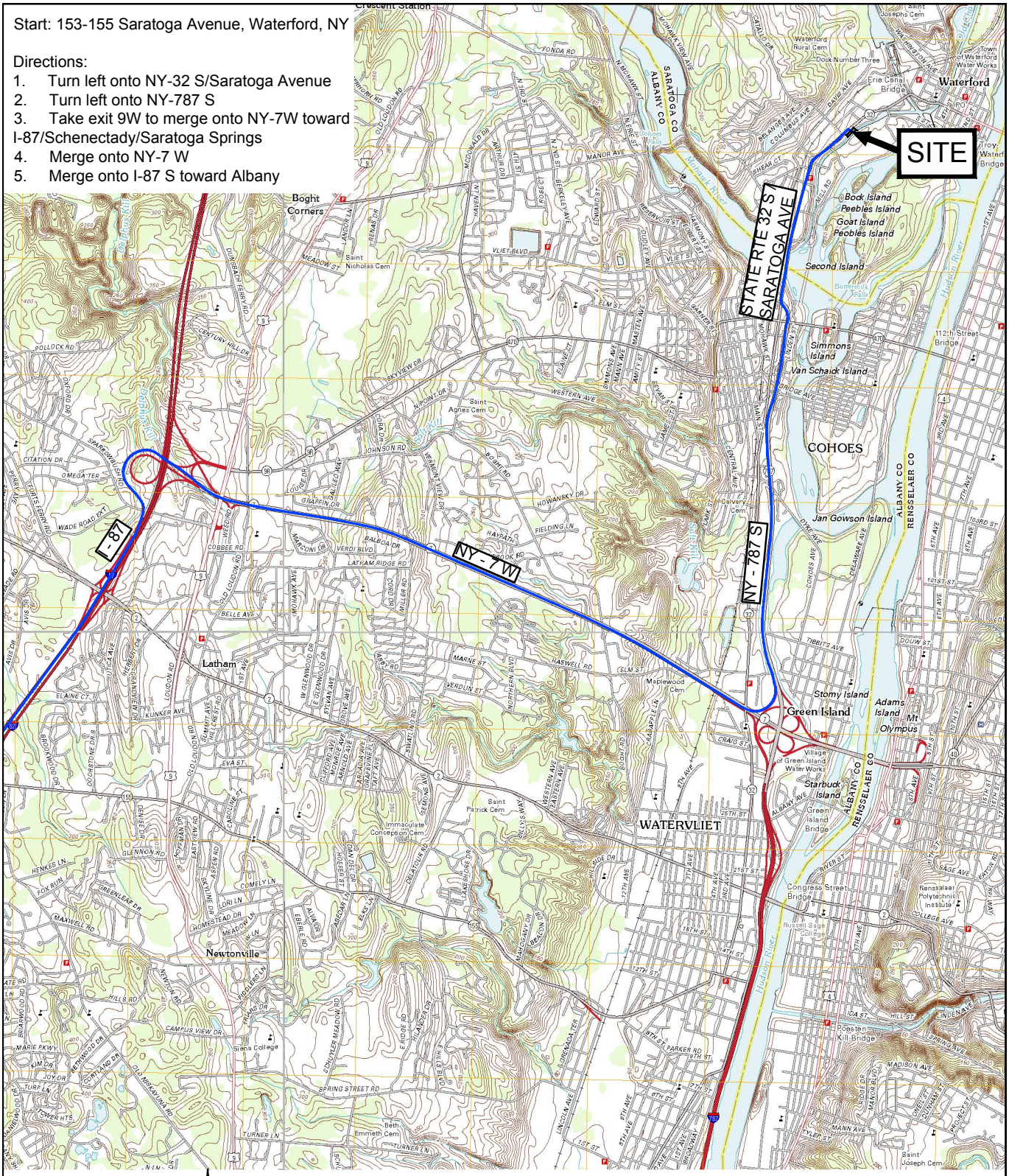
CANAL SEDIMENT
VERIFICATION SAMPLE GRID

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	NOVEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: figure 6.1

80987-20(007)GN-WA017 FEB 24/2016



USGS QUADRANGLE MAPS: TROY NORTH, TROY SOUTH, ALBANY, NISKAYUNA, NEW YORK. 2013

N

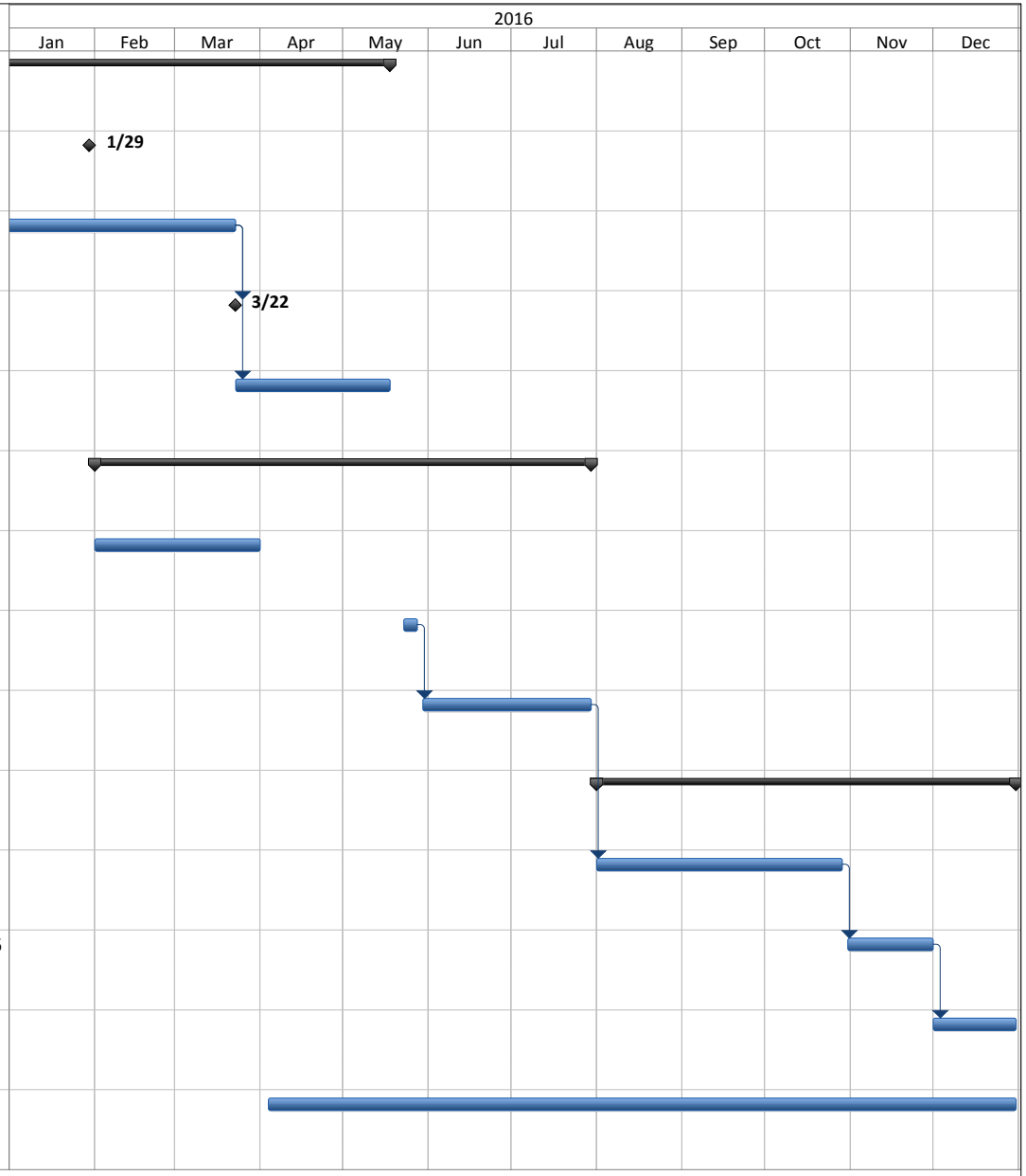
0 2000 4000ft

figure 6.2

TRANSPORTATION ROUTE
PRELIMINARY REMEDIAL DESIGN REPORT
FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave., Waterford, N.Y.

80987-20(007)GN-WA016 FEB 24/2016

WBS	Task Name	Duration	Start	Finish
1	**Preliminary Design**	**229 days**	**Thu 7/2/15**	**Tue 5/17/16**
1.1	Meeting with NYSDEC and NYSCC	1 day	Fri 1/29/16	Fri 1/29/16
1.2	Prepare Preliminary Design	189 days	Thu 7/2/15	Tue 3/22/16
1.3	Submit to NYSDEC	0 days	Tue 3/22/16	Tue 3/22/16
1.4	NYSDEC Review	40 days	Wed 3/23/16	Tue 5/17/16
2	**Hydraulic Analysis of Erie Canal/OCC**	**130 days**	**Mon 2/1/16**	**Fri 7/29/16**
2.1	Prepare Work Plan and Submit to NYSCC and NYSDEC	44 days	Mon 2/1/16	Thu 3/31/16
2.2	Hydraulic Monitoring when Locks are Operated	5 days	Mon 5/23/16	Fri 5/27/16
2.3	Prepare Hydraulic Analysis Summary Memo	45 days	Mon 5/30/16	Fri 7/29/16
3	**Pre-Final/Final Design**	**110 days**	**Mon 8/1/16**	**Fri 12/30/16**
3.1	Prepare Pre-Final Design and Submit to NYSDEC	65 days	Mon 8/1/16	Fri 10/28/16
3.2	NYSDEC Review	23 days	Mon 10/31/16	Wed 11/30/16
3.3	Revise and Submit Final Design	22 days	Thu 12/1/16	Fri 12/30/16
4	**Permitting**	**195 days**	**Mon 4/4/16**	**Fri 12/30/16**



Project: 080987
Date: Tue 3/22/16

Task Milestone Summary

Figure 10.1
Preliminary Design Schedule (March 22, 2016)
Friedrichsohn Cooperage Site, Waterford, New York

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-18	SB-18	SB-18	SB-19	SB-19	SB-19	SB-20	SB-20	SB-20	SB-23
Sample ID:			-	-	-	-	-	-	-	-	-	-
Sample Date:			8/6/2009	8/6/2009	8/6/2009	8/6/2009	8/6/2009	8/6/2009	8/7/2009	8/7/2009	8/7/2009	8/13/2009
Sample Depth:			2-3 ft BGS	14-15 ft BGS	18.5-19.5 ft BGS	4-5 ft BGS	9-10 ft BGS	12.5-13.5 ft BGS	0-1 ft BGS	10-11 ft BGS	15.5-16.5 ft BGS	4-5 ft BGS
Parameters	**Units**	**TSCA Limit**										
PCBs												
Aroclor-1016 (PCB-1016)	mg/kg		0.021 U	0.022 U	0.21 U	0.02 U	0.97 U	0.18 U	0.02 U	0.2 U	0.98 U	0.96 U
Aroclor-1221 (PCB-1221)	mg/kg		0.021 U	0.022 U	0.21 U	0.02 U	0.97 U	0.18 U	0.02 U	0.2 U	0.98 U	0.96 U
Aroclor-1232 (PCB-1232)	mg/kg		0.021 U	0.022 U	0.21 U	0.02 U	0.97 U	0.18 U	0.02 U	0.2 U	0.98 U	0.96 U
Aroclor-1242 (PCB-1242)	mg/kg		0.021 U	0.022 U	0.21 U	0.02 U	0.97 U	0.18 U	0.02 U	0.2 U	0.98 U	6.8
Aroclor-1248 (PCB-1248)	mg/kg		0.021 U	0.18	1.5	0.036	9.2	0.76	0.034	1.4	6.3	0.96 U
Aroclor-1254 (PCB-1254)	mg/kg		0.035 p	0.027 p	0.21 U	0.02 U	0.97 U	0.18 U	0.02 U	0.2 U	0.98 U	0.96 U
Aroclor-1260 (PCB-1260)	mg/kg		0.018 J	0.022 U	0.087 J	0.02 U	0.28 J	0.063 J	0.02 U	0.066 J	0.27 J	0.96 U
Total PCBs (calculated)	mg/kg	50	0.053	0.207	1.587	0.036	9.48	0.823	0.034	1.466	6.57	6.8

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-23	SB-23	SB-23	SB-24	SB-24	SB-31a	SB-31a	SB-31a	SB-31
Sample ID:			-	-	-	-	-	S-80987-051314-BP-045	S-80987-051314-BP-046	S-80987-051314-BP-047	-
Sample Date:			8/13/2009	8/13/2009	8/13/2009	8/13/2009	8/13/2009	5/13/2014	5/13/2014	5/13/2014	12/3/2010
Sample Depth:			9-10 ft BGS	11-12 ft BGS	15-15.5 ft BGS	2-3 ft BGS	11-12 ft BGS	2-3 ft BGS	3-4 ft BGS	4-5 ft BGS	5-6 ft BGS
Parameters	**Units**	**TSCA Limit**									
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg		1.9 U	1.9 U	0.19 U	0.02 U	0.037 U	0.038 U	0.038 U	0.038 U	14 U
Aroclor-1221 (PCB-1221)	mg/kg		1.9 U	1.9 U	0.19 U	0.02 U	0.037 U	0.038 U	0.038 U	0.038 U	15 U
Aroclor-1232 (PCB-1232)	mg/kg		1.9 U	1.9 U	0.19 U	0.02 U	0.037 U	0.038 U	0.038 U	0.038 U	16 U
Aroclor-1242 (PCB-1242)	mg/kg		16	17	2.3	0.02 U	0.29 p	0.038 U	0.04 J	0.038 U	110
Aroclor-1248 (PCB-1248)	mg/kg		1.9 U	1.9 U	0.19 U	0.02 U	0.037 U	0.038 U	0.038 U	0.038 U	14 U
Aroclor-1254 (PCB-1254)	mg/kg		1.9 U	1.9 U	0.19 U	0.12	0.037 U	0.038 U	0.038 U	0.038 U	14 U
Aroclor-1260 (PCB-1260)	mg/kg		1.9 U	1.9 U	0.19 U	0.04	0.037 U	0.038 U	0.038 U	0.038 U	14 U
Total PCBs (calculated)	mg/kg	50	16	17	2.3	0.16	0.29	ND	0.04	ND	110

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-31a	SB-31	SB-32	SB-32a	SB-32	SB-32	SB-33	SB-33	SB-33	SB-36	SB-36	SB-36
Sample ID:			S-80987-051314-BP-048	-	-	S-80987-051314-BP-052	-	-	-	-	-	-	-	-
Sample Date:			5/13/2014	12/3/2010	12/3/2010	5/13/2014	12/3/2010	12/3/2010	12/3/2010	12/3/2010	12/3/2010	12/3/2010	12/3/2010	12/3/2010
Sample Depth:			7-8 ft BGS	12-13 ft BGS	0-1 ft BGS	5-6 ft BGS	6-7 ft BGS	10-11 ft BGS	5-6 ft BGS	7.5-8 ft BGS	10-11 ft BGS	0-1 ft BGS	4-6 ft BGS	9-10 ft BGS
Parameters	**Units**	**TSCA Limit**												
PCBs														
Aroclor-1016 (PCB-1016)	mg/kg		0.73 U	6.5 U	0.27 U	0.038 U	4.1 U	0.3 U	0.27 U	0.28 U	0.3 U	0.28 U	0.27 U	0.26 U
Aroclor-1221 (PCB-1221)	mg/kg		0.73 U	6.5 U	0.27 U	0.038 U	4.1 U	0.3 U	0.27 U	0.28 U	0.3 U	0.28 U	0.27 U	0.26 U
Aroclor-1232 (PCB-1232)	mg/kg		0.73 U	6.5 U	0.27 U	0.038 U	4.1 U	0.3 U	0.27 U	0.28 U	0.3 U	0.28 U	0.27 U	0.26 U
Aroclor-1242 (PCB-1242)	mg/kg		5.7 J	34	0.27 U	0.038 UJ	30	3.7	1.7	0.51	0.57	0.23 J	0.27 U	0.26 U
Aroclor-1248 (PCB-1248)	mg/kg		0.73 U	6.5 U	0.27 U	0.038 UJ	4.1 U	0.3 U	0.27 U	0.28 U	0.3 U	0.28 U	0.27 U	0.26 U
Aroclor-1254 (PCB-1254)	mg/kg		0.73 U	6.5 U	0.27 U	0.038 UJ	4.1 U	0.3 U	0.27 U	0.28 U	0.3 U	0.28 U	0.27 U	0.26 U
Aroclor-1260 (PCB-1260)	mg/kg		0.73 U	6.5 U	0.27 U	0.038 UJ	4.1 U	0.3 U	0.27 U	0.28 U	0.3 U	0.28 U	0.27 U	0.26 U
Total PCBs (calculated)	mg/kg	50	5.7	34	ND	ND	30	3.7	1.7	0.51	0.57	0.23 J	ND	ND

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-37a	SB-37a	SB-37	SB-37	SB-37	SB-38a	SB-38a	SB-38	SB-38	SB-48
Sample ID:			S-80987-051314-BP-063	S-80987-051314-BP-064	-	-	-	S-80987-051314-BP-057	S-80987-051314-BP-058	-	-	-
Sample Date:			5/13/2014	5/13/2014	12/3/2010	12/3/2010	12/3/2010	5/13/2014	5/13/2014	12/3/2010	12/3/2010	12/9/2010
Sample Depth:			2-3 ft BGS	5-6 ft BGS	7-9 ft BGS	7-9 ft BGS Duplicate	10-11 ft BGS	2-3 ft BGS	5-6 ft BGS	6-7 ft BGS	10-11 ft BGS	0.5-1.5 ft BGS
Parameters	**Units**	**TSCA Limit**										
PCBs												
Aroclor-1016 (PCB-1016)	mg/kg		0.035 U	0.18 U	13 U	5.5 U	0.55 U	0.034 U	0.035 U	0.67 U	3.2 U	0.019 U
Aroclor-1221 (PCB-1221)	mg/kg		0.035 U	0.18 U	13 U	5.5 U	0.55 U	0.034 U	0.035 U	0.67 U	3.2 U	0.019 U
Aroclor-1232 (PCB-1232)	mg/kg		0.035 U	0.18 U	13 U	5.5 U	0.55 U	0.034 U	0.035 U	0.67 U	3.2 U	0.019 U
Aroclor-1242 (PCB-1242)	mg/kg		0.056 J	0.83	19	44	8.2 J	0.034 UJ	0.035 UJ	31	42	0.019 U
Aroclor-1248 (PCB-1248)	mg/kg		0.035 UJ	0.18 U	5.5 U	13 U	0.55 U	0.034 UJ	0.035 UJ	0.67 U	3.2 U	0.019 U
Aroclor-1254 (PCB-1254)	mg/kg		0.035 UJ	0.18 U	5.5 U	13 U	0.55 U	0.034 UJ	0.035 UJ	0.67 U	3.2 U	0.0054 J
Aroclor-1260 (PCB-1260)	mg/kg		0.035 UJ	0.18 U	5.5 U	13 U	0.55 U	0.034 UJ	0.035 UJ	0.67 U	3.2 U	0.0074 J
Total PCBs (calculated)	mg/kg	50	0.056	0.83	19	44	8.2	ND	ND	31	42	0.0128

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-48	SB-48	SB-56	SB-56	SB-56	SB-57	SB-57	SB-57	SB-58	SB-58	SB-59	SB-59	SB-59
Sample ID:			-	-	-	-	-	-	-	-	-	-	-	-	-
Sample Date:			12/9/2010	12/9/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
Sample Depth:			11-12 ft BGS	19-20 ft BGS	0.5-1.5 ft BGS	9-10 ft BGS	14-15 ft BGS	1-2 ft BGS	5-6 ft BGS	14-15 ft BGS	4-5 ft BGS	9-10 ft BGS	13-14 ft BGS	4-5 ft BGS	4-5 ft BGS Duplicate
Parameters	**Units**	**TSCA Limit**													
PCBs															
Aroclor-1016 (PCB-1016)	mg/kg		0.83 U	0.48 U	0.021 U	0.019 U	0.49 U	0.02 U	0.04 U	0.48 U	0.11 U	2 U	0.41 U	0.21 U	1 U
Aroclor-1221 (PCB-1221)	mg/kg		0.83 U	0.48 U	0.021 U	0.019 U	0.49 U	0.02 U	0.04 U	0.48 U	0.11 U	2 U	0.41 U	0.21 U	1 U
Aroclor-1232 (PCB-1232)	mg/kg		0.83 U	0.48 U	0.021 U	0.019 U	0.49 U	0.02 U	0.04 U	0.48 U	0.11 U	2 U	0.41 U	0.21 U	1 U
Aroclor-1242 (PCB-1242)	mg/kg		6.2	3.3	0.021 U	0.019 U	6.3	0.02 U	0.61	7	0.56	27	5.2	0.21 U	1 U
Aroclor-1248 (PCB-1248)	mg/kg		0.83 U	0.48 U	0.017 J	0.019 U	0.49 U	0.0066 J	0.04 U	0.48 U	0.11 U	2 U	0.41 U	1.7	14
Aroclor-1254 (PCB-1254)	mg/kg		0.83 U	0.48 U	0.008 J	0.019 U	0.49 U	0.019 J	0.04 U	0.48 U	0.11 U	2 U	0.41 U	0.74	2.8 p
Aroclor-1260 (PCB-1260)	mg/kg		0.83 U	0.48 U	0.0087 J	0.019 U	0.49 U	0.02 U	0.04 U	0.48 U	0.11 U	2 U	0.16 J	0.074 J	0.47 J
Total PCBs (calculated)	mg/kg	50	6.2	3.3	0.0337	ND	6.3	0.0256	0.61	7	0.56	27	5.36	2.514	17.27

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-60	SB-60	SB-64	SB-64	SB-64	SB-65	SB-65	SB-65	SB-65	SB-66	SB-66	SB-66	SB-67
Sample ID:			-	-	-	-	-	-	-	-	-	-	-	-	-
Sample Date:			12/10/2010	12/10/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010
Sample Depth:			4-5 ft BGS	11-12 ft BGS	0-1 ft BGS	6-7 ft BGS	11-12 ft BGS	1-2 ft BGS	4-5 ft BGS	4-5 ft BGS Duplicate	10-11 ft BGS	3-4 ft BGS	6-7 ft BGS	14-15 ft BGS	4-5 ft BGS
Parameters	**Units**	**TSCA Limit**													
PCBs															
Aroclor-1016 (PCB-1016)	mg/kg		0.021 U	0.1 U	0.38 U	0.19 U	0.44 U	0.019 U	0.02 U	0.021 U	2 U	0.097 U	0.2 U	0.54 U	2.1 U
Aroclor-1221 (PCB-1221)	mg/kg		0.021 U	0.1 U	0.38 U	0.19 U	0.44 U	0.019 U	0.02 U	0.021 U	2 U	0.097 U	0.2 U	0.54 U	2.1 U
Aroclor-1232 (PCB-1232)	mg/kg		0.021 U	0.1 U	0.38 U	0.19 U	0.44 U	0.019 U	0.02 U	0.021 U	2 U	0.097 U	0.2 U	0.54 U	2.1 U
Aroclor-1242 (PCB-1242)	mg/kg		0.021 U	1.3	4.6	2.3	4.3	0.011 J	0.02 U	0.021 U	20	1.1	2.7	8.2	19
Aroclor-1248 (PCB-1248)	mg/kg		0.028	0.1 U	0.38 U	0.19 U	0.44 U	0.019 U	0.02 U	0.021 U	2 U	0.097 U	0.2 U	0.54 U	2.1 U
Aroclor-1254 (PCB-1254)	mg/kg		0.031	0.1 U	0.38 U	0.26 p	0.44 U	0.019 U	0.02 U	0.021 U	2 U	0.097 U	0.2 U	0.54 U	2.1 U
Aroclor-1260 (PCB-1260)	mg/kg		0.021 U	0.1 U	0.38 U	0.19 U	0.44 U	0.019 U	0.02 U	0.021 U	2 U	0.097 U	0.2 U	0.54 U	2.1 U
Total PCBs (calculated)	mg/kg	50	0.059	1.3	4.6	2.56	4.3	0.011	ND	ND	20	1.1	2.7	8.2	19

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-67	SB-67	SB-68	SB-68	SB-68	SB-71a	SB-71	SB-71	SB-71	SB-71	SB-72
Sample ID:			-	-	-	-	-	S-80987-051214-BP-022	-	-	-	-	-
Sample Date:			12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010	5/12/2014	12/16/2010	12/16/2010	12/16/2010	12/16/2010	12/16/2010
Sample Depth:			7-8 ft BGS	10-12 ft BGS	4-5 ft BGS	8-9 ft BGS	12-13 ft BGS	2-3 ft BGS	3-4 ft BGS	6-7 ft BGS	6-7 ft BGS Duplicate	10-11 ft BGS	1-2 ft BGS
Parameters	**Units**	**TSCA Limit**											
PCBs													
Aroclor-1016 (PCB-1016)	mg/kg		0.49 U	0.46 U	0.024 U	0.045 U	0.19 U	2 U	0.022 U	0.041 U	0.021 U	0.2 U	0.018 U
Aroclor-1221 (PCB-1221)	mg/kg		0.49 U	0.46 U	0.024 U	0.045 U	0.19 U	2 U	0.022 U	0.041 U	0.021 U	0.2 U	0.018 U
Aroclor-1232 (PCB-1232)	mg/kg		0.49 U	0.46 U	0.024 U	0.045 U	0.19 U	2 U	0.022 U	0.041 U	0.021 U	0.2 U	0.018 U
Aroclor-1242 (PCB-1242)	mg/kg		6.5	6	0.33	0.48	2.7	14	0.26	0.54	0.074	1.6	0.023
Aroclor-1248 (PCB-1248)	mg/kg		0.49 U	0.46 U	0.024 U	0.045 U	0.19 U	2 U	0.022 U	0.041 U	0.021 U	0.2 U	0.018 U
Aroclor-1254 (PCB-1254)	mg/kg		0.49 U	0.46 U	0.024 U	0.045 U	0.19 U	2 U	0.022 U	0.041 U	0.021 U	0.2 U	0.006 J
Aroclor-1260 (PCB-1260)	mg/kg		0.49 U	0.46 U	0.024 U	0.045 U	0.19 U	2 U	0.022 U	0.041 U	0.021 U	0.2 U	0.018 U
Total PCBs (calculated)	mg/kg	50	6.5	6	0.33	0.48	2.7	14	0.26	0.54	0.074	1.6	0.029

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-72a	SB-72a	SB-72a	SB-72	SB-72	SB-73a	SB-73a	SB-73	SB-73
Sample ID:			S-80987-051214-BP-018	S-80987-051214-BP-019	S-80987-051214-BP-020	-	-	S-80987-051214-BP-014	S-80987-051214-BP-015	-	-
Sample Date:			5/12/2014	5/12/2014	5/12/2014	12/16/2010	12/16/2010	5/12/2014	5/12/2014	12/16/2010	12/16/2010
Sample Depth:			2-3 ft BGS	3-4 ft BGS	4-5 ft BGS	5-6 ft BGS	11-12 ft BGS	2-3 ft BGS	3-4 ft BGS	4-5 ft BGS	6-7 ft BGS
Parameters	**Units**	**TSCA Limit**									
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg		0.037 U	0.037 U	0.037 U	0.19 U	0.097 U	0.038 U	0.039 U	0.8 U	1.1 U
Aroclor-1221 (PCB-1221)	mg/kg		0.037 U	0.037 U	0.037 U	0.19 U	0.097 U	0.038 U	0.039 U	0.8 U	1.1 U
Aroclor-1232 (PCB-1232)	mg/kg		0.037 U	0.037 U	0.037 U	0.19 U	0.097 U	0.038 U	0.039 U	0.8 U	1.1 U
Aroclor-1242 (PCB-1242)	mg/kg		0.037 U	0.047	0.1	3	1.5	0.038 U	0.039 U	12	14
Aroclor-1248 (PCB-1248)	mg/kg		0.037 U	0.037 U	0.037 U	0.19 U	0.097 U	0.038 U	0.039 U	0.8 U	1.1 U
Aroclor-1254 (PCB-1254)	mg/kg		0.037 U	0.037 U	0.037 U	0.19 U	0.097 U	0.038 U	0.039 U	0.8 U	1.1 U
Aroclor-1260 (PCB-1260)	mg/kg		0.037 U	0.037 U	0.037 U	0.19 U	0.097 U	0.038 U	0.039 U	0.8 U	1.1 U
Total PCBs (calculated)	mg/kg	50	ND	0.047	0.1	3	1.5	ND	ND	12	14

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-73	SB-74	SB-74a	SB-74	SB-74a	SB-74a	SB-74	SB-75a	SB-75a
Sample ID:			-	-	S-80987-051214-BP-024	-	S-80987-051214-BP-025	S-80987-051214-BP-026	-	S-80987-051214-BP-007	S-80987-051214-BP-008
Sample Date:			12/16/2010	12/16/2010	5/12/2014	12/16/2010	5/12/2014	5/12/2014	12/16/2010	5/12/2014	5/12/2014
Sample Depth:			11-12 ft BGS	4-5 ft BGS	5-6 ft BGS	7-8 ft BGS	7-8 ft BGS	8-9 ft BGS	10-11 ft BGS	2-3 ft BGS	3-4 ft BGS
Parameters	**Units**	**TSCA Limit**									
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg		0.38 U	0.19 U	0.16 U	130 U	0.38 U	0.36 U	0.79 U	0.038 U	0.039 U
Aroclor-1221 (PCB-1221)	mg/kg		0.38 U	0.19 U	0.16 U	130 U	0.38 U	0.36 U	0.79 U	0.038 U	0.039 U
Aroclor-1232 (PCB-1232)	mg/kg		0.38 U	0.19 U	0.16 U	130 U	0.38 U	0.36 U	0.79 U	0.038 U	0.039 U
Aroclor-1242 (PCB-1242)	mg/kg		5.8	2.3	1.3 J	1000	2 J	1.3	12	0.038 U	0.039 U
Aroclor-1248 (PCB-1248)	mg/kg		0.38 U	0.19 U	0.16 U	130 U	0.38 U	0.36 U	0.79 U	0.038 U	0.039 U
Aroclor-1254 (PCB-1254)	mg/kg		0.38 U	0.19 U	0.16 U	130 U	0.38 U	0.36 U	0.79 U	0.038 U	0.039 U
Aroclor-1260 (PCB-1260)	mg/kg		0.38 U	0.19 U	0.16 U	130 U	0.38 U	0.36 U	0.79 U	0.038 U	0.039 U
Total PCBs (calculated)	mg/kg	50	5.8	2.3	1.3	**1000**	2	1.3	12	ND	ND

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-75	SB-75	SB-75	SB-76	SB-76a	SB-76a	SB-76	SB-76a	SB-76	SB-77a
Sample ID:			-	-	-	-	S-80987-051214-BP-009	S-80987-051214-BP-010	-	S-80987-051214-BP-011	-	S-80987-051214-BP-012
Sample Date:			12/16/2010	12/16/2010	12/16/2010	12/16/2010	5/12/2014	5/12/2014	12/16/2010	5/12/2014	12/16/2010	5/12/2014
Sample Depth:			5-6 ft BGS	9-10 ft BGS	13-14 ft BGS	0-1 ft BGS	2-3 ft BGS	3-4 ft BGS	4-5 ft BGS	7-8 ft BGS	9-10 ft BGS	2-3 ft BGS
Parameters	**Units**	**TSCA Limit**										
PCBs												
Aroclor-1016 (PCB-1016)	mg/kg		2 U	2 U	0.2 U	0.018 U	0.036 U	0.038 U	8.3 U	0.15 U	0.2 U	0.047 U
Aroclor-1221 (PCB-1221)	mg/kg		2 U	2 U	0.2 U	0.018 U	0.036 U	0.038 U	8.3 U	0.15 U	0.2 U	0.047 U
Aroclor-1232 (PCB-1232)	mg/kg		2 U	2 U	0.2 U	0.018 U	0.036 U	0.038 U	8.3 U	0.15 U	0.2 U	0.047 U
Aroclor-1242 (PCB-1242)	mg/kg		15	8.9	3.1	0.18	0.036 U	0.038 U	72	0.95 J	2.1	0.047 U
Aroclor-1248 (PCB-1248)	mg/kg		2 U	2 U	0.2 U	0.018 U	0.036 U	0.038 U	8.3 U	0.15 UJ	0.2 U	0.047 U
Aroclor-1254 (PCB-1254)	mg/kg		2 U	2 U	0.2 U	0.018 U	0.036 U	0.038 U	8.3 U	0.15 UJ	0.2 U	0.047 U
Aroclor-1260 (PCB-1260)	mg/kg		2 U	2 U	0.2 U	0.018 U	0.036 U	0.038 U	8.3 U	0.15 UJ	0.2 U	0.047 U
Total PCBs (calculated)	mg/kg	50	15	8.9	3.1	0.18	ND	ND	72	0.95	2.1	ND

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-77	SB-77a	SB-77	SB-77	SB-80a	SB-80a	SB-80	SB-80	SB-80	SB-80
Sample ID:			-	S-80987-051214-BP-013	-	-	S-80987-051214-BP-005	S-80987-051214-BP-006	-	-	-	-
Sample Date:			12/16/2010	5/12/2014	12/16/2010	12/16/2010	5/12/2014	5/12/2014	12/16/2010	12/16/2010	12/16/2010	12/16/2010
Sample Depth:			3-4 ft BGS	3-4 ft BGS	6-7 ft BGS	11-12 ft BGS	2-3 ft BGS	3-4 ft BGS	4-5 ft BGS	7-8 ft BGS	7-8 ft BGS Duplicate	10-11 ft BGS
Parameters	**Units**	**TSCA Limit**										
PCBs												
Aroclor-1016 (PCB-1016)	mg/kg		0.12 U	0.039 U	0.02 U	0.044 U	0.37 U	0.042 U	0.11 U	0.021 U	0.02 U	0.2 U
Aroclor-1221 (PCB-1221)	mg/kg		0.12 U	0.039 U	0.02 U	0.044 U	0.37 U	0.042 U	0.11 U	0.021 U	0.02 U	0.2 U
Aroclor-1232 (PCB-1232)	mg/kg		0.12 U	0.039 U	0.02 U	0.044 U	0.37 U	0.042 U	0.11 U	0.021 U	0.02 U	0.2 U
Aroclor-1242 (PCB-1242)	mg/kg		1.3	0.039 U	0.28	0.51	1.8	0.042 U	0.67	0.016 J	0.15	1.1
Aroclor-1248 (PCB-1248)	mg/kg		0.12 U	0.039 U	0.02 U	0.044 U	0.37 U	0.042 U	0.11 U	0.021 U	0.02 U	0.2 U
Aroclor-1254 (PCB-1254)	mg/kg		0.12 U	0.039 U	0.02 U	0.044 U	0.37 U	0.042 U	0.11 U	0.021 U	0.02 U	0.2 U
Aroclor-1260 (PCB-1260)	mg/kg		0.12 U	0.039 U	0.02 U	0.044 U	0.37 U	0.41 J	0.11 U	0.021 U	0.02 U	0.2 U
Total PCBs (calculated)	mg/kg	50	1.3	ND	0.28	0.51	1.8	0.41	0.67	0.016	0.15	1.1

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-81a	SB-81a	SB-81	SB-81	SB-81	SB-82a	SB-82a	SB-82	SB-82	SB-83
Sample ID:			S-80987-051214-BP-003	S-80987-051214-BP-004	-	-	-	S-80987-051214-BP-001	S-80987-051214-BP-002	-	-	-
Sample Date:			5/12/2014	5/12/2014	12/16/2010	12/16/2010	12/16/2010	5/12/2014	5/12/2014	12/16/2010	12/16/2010	12/17/2010
Sample Depth:			2-3 ft BGS	3-4 ft BGS	5-6 ft BGS	8-9 ft BGS	10-11 ft BGS	2-3 ft BGS	3-4 ft BGS	6-7 ft BGS	12-13 ft BGS	1-2 ft BGS
Parameters	**Units**	**TSCA Limit**										
PCBs												
Aroclor-1016 (PCB-1016)	mg/kg		0.038 U	0.037 U	0.038 U	0.2 U	1 U	0.037 U	0.038 U	0.019 U	0.51 U	0.018 U
Aroclor-1221 (PCB-1221)	mg/kg		0.038 U	0.037 U	0.038 U	0.2 U	1 U	0.037 U	0.038 U	0.019 U	0.51 U	0.018 U
Aroclor-1232 (PCB-1232)	mg/kg		0.038 U	0.037 U	0.038 U	0.2 U	1 U	0.037 U	0.038 U	0.019 U	0.51 U	0.018 U
Aroclor-1242 (PCB-1242)	mg/kg		0.28 J	0.037 U	0.53	1.5	6.4	0.037 U	0.038 U	0.24	4.4	0.018 U
Aroclor-1248 (PCB-1248)	mg/kg		0.038 UJ	0.037 U	0.038 U	0.2 U	1 U	0.037 U	0.038 U	0.019 U	0.51 U	0.018 U
Aroclor-1254 (PCB-1254)	mg/kg		0.038 UJ	0.037 U	0.038 U	0.2 U	1 U	0.037 U	0.038 U	0.029 p	0.51 U	0.018 U
Aroclor-1260 (PCB-1260)	mg/kg		0.038 UJ	0.037 U	0.038 U	0.2 U	1 U	0.037 U	0.038 U	0.019 U	0.51 U	0.018 U
Total PCBs (calculated)	mg/kg	50	0.28	ND	0.53	1.5	6.4	ND	ND	0.269	4.4	ND

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-83	SB-83	SB-84	SB-84	SB-84	SB-85	SB-85	SB-85	SB-86	SB-86	SB-86	SB-86	SB-89
Sample ID:			-	-	-	-	-	-	-	-	-	-	-	-	-
Sample Date:			12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010
Sample Depth:			6-7 ft BGS	9-10 ft BGS	7-8 ft BGS	7-8 ft BGS Duplicate	12-13 ft BGS	1-2 ft BGS	6-7 ft BGS	10-11 ft BGS	1-2 ft BGS	5-6 ft BGS	7-8 ft BGS	10-11 ft BGS	4-5 ft BGS
Parameters	**Units**	**TSCA Limit**													
PCBs															
Aroclor-1016 (PCB-1016)	mg/kg		0.02 U	0.022 U	2.2 U	0.88 U	3.9 U	0.018 U	0.3 U	0.48 U	0.019 U	0.4 U	0.21 U	0.49 U	0.04 U
Aroclor-1221 (PCB-1221)	mg/kg		0.02 U	0.022 U	2.2 U	0.88 U	3.9 U	0.018 U	0.3 U	0.48 U	0.019 U	0.4 U	0.21 U	0.49 U	0.04 U
Aroclor-1232 (PCB-1232)	mg/kg		0.02 U	0.022 U	2.2 U	0.88 U	3.9 U	0.018 U	0.3 U	0.48 U	0.019 U	0.4 U	0.21 U	0.49 U	0.04 U
Aroclor-1242 (PCB-1242)	mg/kg		0.049	0.011 J	19	6.9	13	0.051	1.4	3.7	0.12	2.3	1.3	4.4	0.42
Aroclor-1248 (PCB-1248)	mg/kg		0.02 U	0.022 U	2.2 U	0.88 U	3.9 U	0.018 U	0.3 U	0.48 U	0.019 U	0.4 U	0.21 U	0.49 U	0.04 U
Aroclor-1254 (PCB-1254)	mg/kg		0.02 U	0.022 U	2.2 U	0.88 U	3.9 U	0.018 U	0.22 J	0.48 U	0.048 p	0.4 U	0.21 U	0.49 U	0.12 p
Aroclor-1260 (PCB-1260)	mg/kg		0.02 U	0.022 U	2.2 U	0.88 U	3.9 U	0.018 U	0.3 U	0.48 U	0.031	0.4 U	0.21 U	0.49 U	0.04 U
Total PCBs (calculated)	mg/kg	50	0.049	0.011	19	6.9	13	0.051	1.62	3.7	0.199	2.3	1.3	4.4	0.54

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-89	SB-89	SB-90	SB-90	SB-91	SB-91	SB-92a	SB-92a	SB-93a	SB-93a
Sample ID:			-	-	-	-	-	-	S-80987-051314-BP-033	S-80987-051314-BP-034	S-80987-051314-BP-039	S-80987-051314-BP-040
Sample Date:			12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	12/17/2010	5/13/2014	5/13/2014	5/13/2014	5/13/2014
Sample Depth:			6-7 ft BGS	10-11 ft BGS	6-7 ft BGS	10-11 ft BGS	6-7 ft BGS	13-14 ft BGS	2-3 ft BGS	5-6 ft BGS	2-3 ft BGS	5-6 ft BGS
Parameters	**Units**	**TSCA Limit**										
PCBs												
Aroclor-1016 (PCB-1016)	mg/kg		0.42 U	0.21 U	1.1 U	0.4 U	0.04 U	2 U	0.034 U	1.9 U	0.038 U	0.037 U
Aroclor-1221 (PCB-1221)	mg/kg		0.42 U	0.21 U	1.1 U	0.4 U	0.04 U	2 U	0.034 U	1.9 U	0.038 U	0.037 U
Aroclor-1232 (PCB-1232)	mg/kg		0.42 U	0.21 U	1.1 U	0.4 U	0.04 U	2 U	0.034 U	1.9 U	0.038 U	0.037 U
Aroclor-1242 (PCB-1242)	mg/kg		4.7	1.6	13	2.4	0.46	20	0.034 UJ	14	0.038 UJ	0.15
Aroclor-1248 (PCB-1248)	mg/kg		0.42 U	0.21 U	1.1 U	0.4 U	0.04 U	2 U	0.034 UJ	1.9 U	0.038 UJ	0.037 U
Aroclor-1254 (PCB-1254)	mg/kg		0.42 U	0.21 U	1.1 U	0.4 U	0.075	2 U	0.034 UJ	1.9 U	0.038 UJ	0.037 U
Aroclor-1260 (PCB-1260)	mg/kg		0.42 U	0.21 U	1.1 U	0.4 U	0.04 U	2 U	0.034 UJ	1.9 U	0.038 UJ	0.037 U
Total PCBs (calculated)	mg/kg	50	4.7	1.6	13	2.4	0.535	20	ND	14	ND	0.15

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-94a	SB-94a	SB-94a	SB-94a	SB-95a	SB-95a	SB-95a
Sample ID:			S-80987-051414-BP-069	S-80987-051414-BP-070	S-80987-051414-BP-071	S-80987-051414-BP-072	S-80987-051414-BP-073	S-80987-051414-BP-074	S-80987-051414-BP-075
Sample Date:			5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014
Sample Depth:			0-1 ft BGS	1-6 ft BGS	6-11 ft BGS	11-16 ft BGS	0-1 ft BGS	1-6 ft BGS	6-11 ft BGS
Parameters	**Units**	**TSCA Limit**							
PCBs									
Aroclor-1016 (PCB-1016)	mg/kg		0.39 U	0.036 U	0.18 U	0.37 U	0.037 U	4.1 U	0.75 U
Aroclor-1221 (PCB-1221)	mg/kg		0.39 U	0.036 U	0.18 U	0.37 U	0.037 U	4.1 U	0.75 U
Aroclor-1232 (PCB-1232)	mg/kg		0.39 U	0.036 U	0.18 U	0.37 U	0.037 U	4.1 U	0.75 U
Aroclor-1242 (PCB-1242)	mg/kg		3 J	0.29 J	1.1 J	3.9	0.037 UJ	34 J	8.6
Aroclor-1248 (PCB-1248)	mg/kg		0.39 U	0.036 UJ	0.18 U	0.37 U	0.037 UJ	4.1 U	0.75 U
Aroclor-1254 (PCB-1254)	mg/kg		0.39 U	0.036 UJ	0.18 U	0.37 U	0.037 UJ	4.1 U	0.75 U
Aroclor-1260 (PCB-1260)	mg/kg		0.39 U	0.036 UJ	0.18 U	0.37 U	0.037 UJ	4.1 U	0.75 U
Total PCBs (calculated)	mg/kg	50	3	0.29	1.1	3.9	ND	34	8.6

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-95a	SB-96a	SB-96a	SB-96a	SB-96a	SB-96a	SB-97a
Sample ID:			S-80987-051414-BP-076	S-80987-051414-BP-077	S-80987-051414-BP-078	S-80987-051414-BP-079	S-80987-051414-BP-080	S-80987-051414-BP-081	S-80987-051414-BP-089
Sample Date:			5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014
Sample Depth:			11-16 ft BGS	0-1 ft BGS	1-2 ft BGS	1-6 ft BGS	6-11 ft BGS	11-16 ft BGS	0-1 ft BGS
Parameters	**Units**	**TSCA Limit**							
PCBs									
Aroclor-1016 (PCB-1016)	mg/kg		0.76 U	0.73 U	0.37 U	0.38 U	0.035 U	3.7 U	0.037 U
Aroclor-1221 (PCB-1221)	mg/kg		0.76 U	0.73 U	0.37 U	0.38 U	0.035 U	3.7 U	0.037 U
Aroclor-1232 (PCB-1232)	mg/kg		0.76 U	0.73 U	0.37 U	0.38 U	0.035 U	3.7 U	0.037 U
Aroclor-1242 (PCB-1242)	mg/kg		6 J	3.3	1.4	2.3 J	0.035 UJ	13	0.2 J
Aroclor-1248 (PCB-1248)	mg/kg		0.76 U	0.73 U	0.37 U	0.38 U	0.035 UJ	3.7 U	0.037 UJ
Aroclor-1254 (PCB-1254)	mg/kg		0.76 U	0.73 U	0.37 U	0.38 U	0.035 UJ	3.7 U	0.037 UJ
Aroclor-1260 (PCB-1260)	mg/kg		0.76 U	0.73 U	0.37 U	0.38 U	0.035 UJ	3.7 U	0.037 UJ
Total PCBs (calculated)	mg/kg	50	6	3.3	1.4	2.3	ND	13	0.2

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-97a	SB-97a	SB-97a	SB-97a	SB-98a	SB-98a	SB-98a
Sample ID:			S-80987-051414-BP-090	S-80987-051414-BP-091	S-80987-051414-BP-092	S-80987-051414-BP-093	S-80987-051414-BP-094	S-80987-051414-BP-095	S-80987-051414-BP-096
Sample Date:			5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014
Sample Depth:			1-2 ft BGS	1-6 ft BGS	6-11 ft BGS	11-16 ft BGS	0-1 ft BGS	1-6 ft BGS	6-11 ft BGS
Parameters	**Units**	**TSCA Limit**							
PCBs									
Aroclor-1016 (PCB-1016)	mg/kg		0.04 U	3.8 U	3.7 U	4 U	0.036 U	0.038 U	1.9 U
Aroclor-1221 (PCB-1221)	mg/kg		0.04 U	3.8 U	3.7 U	4 U	0.036 U	0.038 U	1.9 U
Aroclor-1232 (PCB-1232)	mg/kg		0.04 U	3.8 U	3.7 U	4 U	0.036 U	0.038 U	1.9 U
Aroclor-1242 (PCB-1242)	mg/kg		0.04 U	20	32	15	0.17 J	0.041 J	5.6
Aroclor-1248 (PCB-1248)	mg/kg		0.04 U	3.8 U	3.7 U	4 U	0.036 U	0.038 U	1.9 U
Aroclor-1254 (PCB-1254)	mg/kg		0.04 U	3.8 U	3.7 U	4 U	0.036 U	0.038 U	1.9 U
Aroclor-1260 (PCB-1260)	mg/kg		0.04 U	3.8 U	3.7 U	4 U	0.036 U	0.038 U	1.9 U
Total PCBs (calculated)	mg/kg	50	ND	20	32	15	0.17	0.041	5.6

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SB-98a	SB-99a	SB-99a	SB-99a	SB-99a	SB-99a	SPB-8	SPB-8
Sample ID:			S-80987-051414-BP-097	S-80987-051414-BP-084	S-80987-051414-BP-085	S-80987-051414-BP-086	S-80987-051414-BP-087	S-80987-051414-BP-088	-	-
Sample Date:			5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	5/14/2014	2/9/2011	2/9/2011
Sample Depth:			11-16 ft BGS	0-1 ft BGS	1-2 ft BGS	1-6 ft BGS	6-11 ft BGS	11-16 ft BGS	6-8 ft BGS	12-14 ft BGS
Parameters	**Units**	**TSCA Limit**								
PCBs										
Aroclor-1016 (PCB-1016)	mg/kg		1.9 U	0.76 U	1.6 U	19 U	0.74 U	3.7 U	0.57 U	0.54 U
Aroclor-1221 (PCB-1221)	mg/kg		1.9 U	0.76 U	1.6 U	19 U	0.74 U	3.7 U	0.57 U	0.54 U
Aroclor-1232 (PCB-1232)	mg/kg		1.9 U	0.76 U	1.6 U	19 U	0.74 U	3.7 U	0.57 U	0.54 U
Aroclor-1242 (PCB-1242)	mg/kg		4.7	9.8	15	130	4.4	14	5.4	5.2
Aroclor-1248 (PCB-1248)	mg/kg		1.9 U	0.76 U	1.6 U	19 U	0.74 U	3.7 U	0.57 U	0.54 U
Aroclor-1254 (PCB-1254)	mg/kg		1.9 U	0.76 U	1.6 U	19 U	0.74 U	3.7 U	0.57 U	0.54 U
Aroclor-1260 (PCB-1260)	mg/kg		1.9 U	0.76 U	1.6 U	19 U	0.74 U	3.7 U	0.57 U	0.54 U
Total PCBs (calculated)	mg/kg	50	4.7	9.8	15	**130**	4.4	14	5.4	5.2

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.1

PCB Soil Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			SPB-8	SPB-9a	SPB-9a	SPB-9	SPB-9	SPB-9	SPB-10	SPB-10
Sample ID:			-	S-80987-051414-BP-082	S-80987-051414-BP-083	-	-	-	-	-
Sample Date:			2/9/2011	5/14/2014	5/14/2014	2/21/2011	2/21/2011	2/21/2011	2/22/2011	2/22/2011
Sample Depth:			14-16 ft BGS	0-1 ft BGS	1-2 ft BGS	3-4 ft BGS	6-8 ft BGS	12-13 ft BGS	4-6 ft BGS	10-12 ft BGS
Parameters	**Units**	**TSCA Limit**								
PCBs										
Aroclor-1016 (PCB-1016)	mg/kg		2 U	0.74 U	390 U	23 U	0.63 U	2 U	0.56 U	2.1 U
Aroclor-1221 (PCB-1221)	mg/kg		2 U	0.74 U	390 U	23 U	0.63 U	2 U	0.56 U	2.1 U
Aroclor-1232 (PCB-1232)	mg/kg		2 U	0.74 U	390 U	23 U	0.63 U	2 U	0.56 U	2.1 U
Aroclor-1242 (PCB-1242)	mg/kg		14	7.1	1600	230	2.1	7.4	3.8	10
Aroclor-1248 (PCB-1248)	mg/kg		2 U	0.74 U	390 U	23 U	0.63 U	2 U	0.56 U	2.1 U
Aroclor-1254 (PCB-1254)	mg/kg		2 U	0.74 U	390 U	23 U	0.63 U	2 U	0.56 U	2.1 U
Aroclor-1260 (PCB-1260)	mg/kg		2 U	0.74 U	390 U	23 U	0.63 U	2 U	0.56 U	2.1 U
Total PCBs (calculated)	mg/kg	50	14	7.1	**1600**	**230**	2.1	7.4	3.8	10

Notes:

ND	Not Detected
U	Not detected at associated detection limit
J	Estimated value
ft BGS	Feet Below Ground Surface
72	Exceeds TSCA
TSCA	Toxic Substance Control Act

Table 3.2

Geotechnical Evaluation for Shoring
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

	Soil Bulk Density (lbs/ft^3)	Coefficient of Active Earth Pressure (K_a)	Coefficient of Earth Pressure at Rest (K_o)	Coefficient of Passive Earth Pressure (K_p)
Sand and Silty Soils	110	0.39	0.56	2.56
Gravelly Soils Below 45 ft. AMSL	115	0.31	0.47	3.25

Note:

Hydraulic pressure due to groundwater at 48 ft. AMSL shall be included in the design of the shoring system
Surcharge load due to construction traffic = 250 psf (minimum)

Table 3.3

Slug Test Results
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Monitoring Well	Type of Well	Rising/Falling Head	Hydraulic Conductivity (cm/sec)			
			Test 1	Test 2	Test 3	Test 4
MW-1S	bedrock	rising head	5.03E-02	5.51E-02	5.77E-02	4.12E-02
		falling head	2.74E-02	2.40E-02	2.61E-02	2.42E-02
MW-6s	bedrock	rising head	6.26E-03	6.33E-03	-	-
		falling head	5.23E-03	6.26E-03	-	-
MW-8	overburden	rising head	3.31E-04	-	-	-
		falling head	4.57E-04	-	-	-
MW-10	overburden	rising head	3.31E-04	-	-	-
		falling head	8.66E-04	-	-	-
MW-15	overburden	rising head	2.94E-03	3.05E-03	2.99E-03	-
		falling head	2.35E-03	2.50E-03	2.41E-03	-

Table 3.4

Groundwater Sampling Results
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			MW-09	PES-1	MW-10	MW-10	MW-10	MW-14	MW-15
Sample ID:			FC-MW-9	WG-80987-060614-BP-114	FC-MW-10	WG-80987-060614-BP-115	WG-80987-060614-BP-116	WG-80987-060514-BP-112	WG-80987-060614-BP-113
Sample Date:			10/8/2009	6/6/2014	10/8/2009	6/6/2014	6/6/2014 Duplicate	6/5/2014	6/6/2014
Parameters	**Units**	**NYSDEC GA**							
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	1	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 UJ
1,1-Dichloroethane	µg/L	5	1 U	2.7 J	100 U	1000 U	1000 U	0.76 J	2.1 J
1,1-Dichloroethene	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	2.0 J	1.8 J
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.04	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.0006	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 UJ
1,2-Dichlorobenzene	µg/L	3	1 U	5.0 U	100 U	1000 U	1000 U	0.89 J	**16**
1,2-Dichloroethane	µg/L	0.6	1 U	**3.9 J**	100 U	1000 U	1000 U	5.0 U	**1.9 J**
1,2-Dichloropropane	µg/L	1	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	3	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	1.1 J
1,4-Dichlorobenzene	µg/L	3	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	**6.8**
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	50	5 U	5.0 U	500 U	1000 U	1000 U	5.0 U	5.0 U
2-Hexanone	µg/L	50	5 U	5.0 U	500 U	1000 U	1000 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L		5 U	18	500 U	1000 U	1000 U	5.0 U	4.2 J
Acetone	µg/L	50	5 U	**290**	**1800**	1000 U	1000 U	**60**	5.0 U
Benzene	µg/L	1	1 U	**18**	**190**	1000 U	**120 J**	**13**	**15**
Bromodichloromethane	µg/L	50	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Bromoform	µg/L	50	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	µg/L	5	1 U	5.0 U	100 U	1000 UJ	1000 U	5.0 U	5.0 U
Carbon disulfide	µg/L	60	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Carbon tetrachloride	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Chlorobenzene	µg/L	5	1 U	**8.6**	**170**	1000 U	**140 J**	2.0 J	**43**
Chloroethane	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	7	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Chloromethane (Methyl chloride)	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	µg/L	5	1 U	**19**	100 U	1000 U	1000 U	**14**	**330**
cis-1,3-Dichloropropene	µg/L		1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Cyclohexane	µg/L		1 U	0.93 J	100 U	1000 U	1000 U	2.5 J	1.9 J
Dibromochloromethane	µg/L	50	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Ethylbenzene	µg/L	5	1 U	**74**	**5400**	**2900**	**3000**	**640**	**92**
Isopropyl benzene	µg/L	5	1 U	2.7 J	**73 J**	1000 U	1000 U	4.7 J	2.1 J
m&p-Xylenes	µg/L		2 U	180	16000	8100	8400	1700	250
Methyl acetate	µg/L		1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Methyl cyclohexane	µg/L		1 U	2.2 J	100 U	1000 U	1000 U	1.2 J	5.0 U
Methyl tert butyl ether (MTBE)	µg/L	10	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Methylene chloride	µg/L	5	1 U	4.3 J	100 U	1000 U	1000 U	5.0 U	1.0 J
o-Xylene	µg/L	5	1 U	**69**	**4900**	**2500**	**2600**	**540**	**87**
Styrene	µg/L	5	1 U	5.0 U	**120**	1000 U	1000 U	5.0 U	5.0 U
Tetrachloroethene	µg/L	5	1 U	0.66 J	**86 J**	1000 U	1000 U	1.5 J	2.0 J
Toluene	µg/L	5	1 U	**660**	**25000 D**	**21000**	**21000**	**1400**	**560**
trans-1,2-Dichloroethene	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	**9.2**
trans-1,3-Dichloropropene	µg/L		1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U

Table 3.4

Groundwater Sampling Results
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			MW-09	PES-1	MW-10	MW-10	MW-10	MW-14	MW-15
Sample ID:			FC-MW-9	WG-80987-060614-BP-114	FC-MW-10	WG-80987-060614-BP-115	WG-80987-060614-BP-116	WG-80987-060514-BP-112	WG-80987-060614-BP-113
Sample Date:			10/8/2009	6/6/2014	10/8/2009	6/6/2014	6/6/2014 Duplicate	6/5/2014	6/6/2014
Parameters	**Units**	**NYSDEC GA**							
Trichloroethene	µg/L	5	1 U	13	240	230 J	230 J	13	5.4
Trichlorofluoromethane (CFC-11)	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	5	1 U	5.0 U	100 U	1000 U	1000 U	5.0 U	5.0 U
Vinyl chloride	µg/L	2	1 U	3.1 J	100 U	1000 U	1000 U	1.2 J	130
Xylenes (total)	µg/L	5	-	250	-	11000	11000	2200	330
Semi-volatile Organic Compounds									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
2,4,5-Trichlorophenol	µg/L		11 UJ	200 U	1000 U	17 J	14 J	80 U	20 U
2,4,6-Trichlorophenol	µg/L		11 UJ	100 U	100 J	31 J	23 J	40 U	10 U
2,4-Dichlorophenol	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
2,4-Dimethylphenol	µg/L	50	11 UJ	1900	11000 D	12000	15000	120	78 J
2,4-Dinitrophenol	µg/L	10	11 UJ	200 U	1000 UJ	200 U	200 U	80 U	20 U
2,4-Dinitrotoluene	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
2,6-Dinitrotoluene	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
2-Chloronaphthalene	µg/L	10	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
2-Chlorophenol	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
2-Methylnaphthalene	µg/L		11 UJ	100 U	1000 U	100 U	11 J	40 U	10 U
2-Methylphenol	µg/L		11 UJ	540	8700 D	4400 J	5300	41	28 J
2-Nitroaniline	µg/L	5	11 UJ	200 U	1000 U	200 U	200 U	80 U	20 U
2-Nitrophenol	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
3&4-Methylphenol	µg/L		11 UJ	2800	33000 D	17000	20000	120	56 J
3,3'-Dichlorobenzidine	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
3-Nitroaniline	µg/L	5	11 UJ	200 U	1000 U	200 U	200 U	80 U	20 U
4,6-Dinitro-2-methylphenol	µg/L		11 UJ	200 U	1000 UJ	200 U	200 U	80 U	20 U
4-Bromophenyl phenyl ether	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
4-Chloro-3-methylphenol	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
4-Chloroaniline	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
4-Chlorophenyl phenyl ether	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
4-Nitroaniline	µg/L	5	11 UJ	200 U	1000 U	200 U	200 U	80 U	20 U
4-Nitrophenol	µg/L		11 UJ	200 U	1000 U	200 U	200 U	80 U	20 U
Acenaphthene	µg/L	20	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Acenaphthylene	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Acetophenone	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Anthracene	µg/L	50	11 UJ	25 J	1000 U	100 U	100 U	40 U	10 U
Atrazine	µg/L	7.5	11 UJ	100 UJ	1000 U	100 UJ	100 UJ	40 UJ	10 UJ
Benzaldehyde	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Benzo(a)anthracene	µg/L	0.002	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Benzo(a)pyrene	µg/L		11 U	100 U	1000 U	100 U	100 U	40 U	10 U
Benzo(b)fluoranthene	µg/L	0.002	11 U	100 U	1000 U	100 U	100 U	40 U	10 U
Benzo(g,h,i)perylene	µg/L		11 U	100 U	1000 U	100 U	100 U	40 U	10 U
Benzo(k)fluoranthene	µg/L	0.002	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Biphenyl (1,1-Biphenyl)	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
bis(2-Chloroethoxy)methane	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
bis(2-Chloroethyl)ether	µg/L	1	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	5	11 UJ	100 U	110 J	100 U	100 U	40 U	10 U

Table 3.4

Groundwater Sampling Results
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			**MW-09**	**PES-1**	**MW-10**	**MW-10**	**MW-10**	**MW-14**	**MW-15**
Sample ID:			**FC-MW-9**	**WG-80987-060614-BP-114**	**FC-MW-10**	**WG-80987-060614-BP-115**	**WG-80987-060614-BP-116**	**WG-80987-060514-BP-112**	**WG-80987-060614-BP-113**
Sample Date:			**10/8/2009**	**6/6/2014**	**10/8/2009**	**6/6/2014**	**6/6/2014 Duplicate**	**6/5/2014**	**6/6/2014**
Parameters	**Units**	**NYSDEC GA**							
Butyl benzylphthalate (BBP)	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Caprolactam	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Carbazole	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Chrysene	µg/L	0.002	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Dibenz(a,h)anthracene	µg/L		11 U	100 U	1000 U	100 U	100 U	40 U	10 U
Dibenzofuran	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Diethyl phthalate	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Dimethyl phthalate	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Di-n-butylphthalate (DBP)	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	2.8 J
Di-n-octyl phthalate (DnOP)	µg/L	50	11 U	100 U	1000 U	100 U	100 U	40 U	10 U
Fluoranthene	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Fluorene	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Hexachlorobenzene	µg/L	0.04	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Hexachlorobutadiene	µg/L	0.5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Hexachlorocyclopentadiene	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Hexachloroethane	µg/L	5	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	0.002	11 U	100 U	1000 U	100 U	100 U	40 U	10 U
Isophorone	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Naphthalene	µg/L	10	11 UJ	100 U	1000 U	**60 J**	**44 J**	6.6 J	10 U
Nitrobenzene	µg/L	0.4	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
N-Nitrosodi-n-propylamine	µg/L		11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
N-Nitrosodiphenylamine	µg/L	50	11 UJ	100 U	1000 U	100 U	100 U	40 U	10 U
Pentachlorophenol	µg/L	1	11 UJ	200 U	1000 U	200 U	200 U	80 U	20 U
Phenanthrene	µg/L	50	11 UJ	**110**	1000 U	100 U	100 U	40 U	10 U
Phenol	µg/L	1	11 UJ	**2500**	**80000 D**	**13000**	**14000**	**65**	**28 J**
Pyrene	µg/L	50	11 UJ	21 J	1000 U	100 U	100 U	40 U	10 U
Metals									
Aluminum	µg/L		159	20400	2790	4390	3880	11800	11400
Antimony	µg/L	3	**6 J**	1.5 J	**14 J**	**5.1 J**	**4.8 J**	1.1 J	6.0 U
Arsenic	µg/L	25	10 U	**92.7**	**168**	**64.9**	**63.5**	18.0	25.0
Barium	µg/L	1000	**1860**	**1920**	724	471	464	177	421
Beryllium	µg/L	3	3 U	3.0 U	**7.82**	20 U	20 U	3.0 U	3.0 U
Cadmium	µg/L	5	3 U	3.0 U	3.13	20 U	20 U	3.0 U	3.0 U
Calcium	µg/L		18300	92700	17600	16100	15200	10700	19100
Chromium	µg/L	50	5 U	37.2	**197**	**63.8**	**60.8**	24.2	18.9
Cobalt	µg/L		15 U	30.0	37.7	20 U	20 U	11.0	14.7
Copper	µg/L	200	10 U	79.7 J	138	**204 J**	199 J	74.7 J	56.0 J
Cyanide (total)	µg/L	200	0.01 U	-	0.187	-	-	-	-
Iron	µg/L	300	296	**240000 J**	**9920**	**15800 J**	**13900 J**	**19800 J**	**29200 J**
Lead	µg/L	25	5.33 J	**80.1 J**	**321**	**185 J**	**179 J**	**67.5 J**	**42.4 J**
Magnesium	µg/L	35000	5420	26200	361 J	10000 U	10000 U	4220	8130
Manganese	µg/L	300	87.2	**5120**	**589**	**973**	**859**	**1240**	**7590**
Mercury	µg/L	0.7	0.2 U	0.20 U	**1.03 J**	0.58	0.58	0.15 J	0.14 J
Nickel	µg/L	100	14.2 J	64.3 J	**626**	**225 J**	**218 J**	38.5 J	40.0 J
Potassium	µg/L		12400	17000	26400	13200	13000	4780	9290

Table 3.4

Groundwater Sampling Results
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:			MW-09	PES-1	MW-10	MW-10	MW-10	MW-14	MW-15
Sample ID:			FC-MW-9	WG-80987-060614-BP-114	FC-MW-10	WG-80987-060614-BP-115	WG-80987-060614-BP-116	WG-80987-060514-BP-112	WG-80987-060614-BP-113
Sample Date:			10/8/2009	6/6/2014	10/8/2009	6/6/2014	6/6/2014 Duplicate	6/5/2014	6/6/2014
Parameters	**Units**	**NYSDEC GA**							
Selenium	µg/L	10	10 U	15 UJ	45.4	100 UJ	100 UJ	15 UJ	15 UJ
Silver	µg/L	50	5 U	3.0 U	1.5 J	20 U	20 U	3.0 U	3.0 U
Sodium	µg/L	20000	225000	401000	1000 U	2050000	2030000	549000	398000
Thallium	µg/L	0.5	20 U	3.0 U	20 U	20 U	20 U	3.0 U	3.0 U
Vanadium	µg/L		20 U	72.2	904	443	444	64.6	30.4
Zinc	µg/L	2000	25.8	224	97.7	69.9	61.9	76.2	92.0
PCBs									
Aroclor-1016 (PCB-1016)	µg/L		0.05 U	2000 U	5 U	5.0 U	20 U	20 U	1.0 U
Aroclor-1221 (PCB-1221)	µg/L		0.05 U	2000 U	5 U	5.0 U	20 U	20 U	1.0 U
Aroclor-1232 (PCB-1232)	µg/L		0.05 U	2000 U	5 U	5.0 U	20 U	20 U	1.0 U
Aroclor-1242 (PCB-1242)	µg/L		0.05 U	20000	2200	23 J	190 J	120	4.8
Aroclor-1248 (PCB-1248)	µg/L		0.05 U	2000 U	5 U	5.0 U	20 U	20 U	1.0 U
Aroclor-1254 (PCB-1254)	µg/L		0.05 U	2000 U	5 U	5.0 U	20 U	20 U	1.0 U
Aroclor-1260 (PCB-1260)	µg/L		0.05 UJ	2000 U	5 UJ	5.0 U	20 U	20 U	1.0 UJ
Total PCBs (calculated)	µg/L	0.09	0	20000	2200	23	190	120	4.8
Pesticides									
4,4'-DDD	µg/L	0.3	0.05 U	-	10 UJ	-	-	-	-
4,4'-DDE	µg/L	0.2	0.05 U	-	10 U	-	-	-	-
4,4'-DDT	µg/L	0.2	0.05 UJ	-	10 UJ	-	-	-	-
Aldrin	µg/L		0.05 U	-	10 U	-	-	-	-
alpha-BHC	µg/L	0.01	0.05 U	-	10 U	-	-	-	-
alpha-Chlordane	µg/L		0.05 U	-	10 U	-	-	-	-
beta-BHC	µg/L	0.04	0.05 UJ	-	10 U	-	-	-	-
delta-BHC	µg/L	0.04	0.05 U	-	10 UJ	-	-	-	-
Dieldrin	µg/L	0.004	0.05 U	-	10 U	-	-	-	-
Endosulfan I	µg/L		0.05 U	-	10 U	-	-	-	-
Endosulfan II	µg/L		0.05 U	-	10 U	-	-	-	-
Endosulfan sulfate	µg/L		0.05 U	-	10 U	-	-	-	-
Endrin	µg/L		0.05 U	-	10 UJ	-	-	-	-
Endrin aldehyde	µg/L	5	0.05 U	-	10 U	-	-	-	-
Endrin ketone	µg/L	5	0.05 U	-	10 U	-	-	-	-
gamma-BHC (lindane)	µg/L	0.05	0.05 U	-	10 U	-	-	-	-
gamma-Chlordane	µg/L		0.05 U	-	10 U	-	-	-	-
Heptachlor	µg/L	0.04	0.05 U	-	10 U	-	-	-	-
Heptachlor epoxide	µg/L	0.03	0.05 U	-	10 U	-	-	-	-
Methoxychlor	µg/L	35	0.05 U	-	10 UJ	-	-	-	-
Toxaphene	µg/L	0.06	0.054 U	-	100 U	-	-	-	-

Notes:

U Not detected at associated detection limit
J Estimated value
NYSDEC New York State Department Environmental Conservation
Criteria Class GA Standard - June 1998

Table 3.5

Wastewater Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:		**PES-1/MW-10/14/15**	**MW-14/MW-15**
Sample ID:		**WW-80987-060514-BP-111**	**WW-80987-052214-BP-110**
Sample Date:		**6/5/2014**	**5/22/2014**
Parameters	**Units**		
Volatile Organic Compounds			
1,1-Dichloroethene	µg/L	-	250 U
1,2-Dichloroethane	µg/L	-	250 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	-	250 U
Benzene	µg/L	-	76 J
Carbon tetrachloride	µg/L	-	250 U
Chlorobenzene	µg/L	-	85 J
Chloroform (Trichloromethane)	µg/L	-	250 U
Tetrachloroethene	µg/L	-	43 J
Trichloroethene	µg/L	-	110 J
Vinyl chloride	µg/L	-	250 U
Semi-volatile Organic Compounds			
1,4-Dichlorobenzene	µg/L	10 U	-
2,4,5-Trichlorophenol	µg/L	2.1 J	-
2,4,6-Trichlorophenol	µg/L	3.3 J	-
2,4-Dinitrotoluene	µg/L	10 U	-
2-Methylphenol	µg/L	100 DJ	-
3&4-Methylphenol	µg/L	340 D	-
Hexachlorobenzene	µg/L	6.0 J	-
Hexachlorobutadiene	µg/L	10 U	-
Hexachloroethane	µg/L	10 U	-
Nitrobenzene	µg/L	10 U	-
Pentachlorophenol	µg/L	13 J	-
Pyridine	µg/L	20 U	-
Metals - TCLP			
Arsenic	µg/L	21.7	-
Barium	µg/L	95.4 J	-
Cadmium	µg/L	5.0 U	-
Chromium	µg/L	17.6 J	-
Lead	µg/L	48.1	-
Mercury	µg/L	0.13 J	-
Selenium	µg/L	30.0 U	-
Silver	µg/L	30 U	-

Table 3.5

Wastewater Analytical Results (OU-3 Source Area)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:		**PES-1/MW-10/14/15**	**MW-14/MW-15**
Sample ID:		**WW-80987-060514-BP-111**	**WW-80987-052214-BP-110**
Sample Date:		**6/5/2014**	**5/22/2014**
Parameters	**Units**		
PCBs			
Aroclor-1016 (PCB-1016)	µg/L	10 U	-
Aroclor-1221 (PCB-1221)	µg/L	10 U	-
Aroclor-1232 (PCB-1232)	µg/L	10 U	-
Aroclor-1242 (PCB-1242)	µg/L	63	-
Aroclor-1248 (PCB-1248)	µg/L	10 U	-
Aroclor-1254 (PCB-1254)	µg/L	10 U	-
Aroclor-1260 (PCB-1260)	µg/L	10 U	-
General Chemistry			
Cyanide (total)	mg/L	-	0.020 U
Ignitability	Deg F	-	150
pH, lab	s.u.	-	10
Reactive sulfide	mg/L	-	0.030 U

Table 4.1

Summary of Sediment Coring Activities
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Station ID	Sampling Reason (TSCA/Aerial/ Vertical)	Sample Date	Sample ID	Proposed Start Depth of Sampling (ft)	Actual Sample Interval (ft)	Water Depth (ft)	Penetration (ft)	Recovery (ft)	% Recovery	Number of Attempts	QA/QC	Analysis	Total PCBs (mg/kg)	Comments
SD-200	V	11/20/2014	126	4.5	4.0 to 4.3	2.7	4.8	4.3	90%	2	-	PCB/MC	ND	Sample collected at refusal and placed on hold.
SD-201	A/V	11/20/2014	123	0	0 to 1	4.8	3.0	2.4	79%	2	-	PCB/MC	2.8	- -
SD-201	A/V	11/20/2014	124	0	1 to 2	4.8	3.0	2.4	79%	2	-	PCB/MC	0.258	- -
SD-201	A/V	11/20/2014	125	0	2 to 2.4	4.8	3.0	2.4	79%	2	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-202	A/V	11/20/2014	117	0	0 to 1	2.1	3.2	3.2	100%	1	-	PCB/MC	3.5	- -
SD-202	A/V	11/20/2014	118	0	1 to 2	2.1	3.2	3.2	100%	1	-	PCB/MC	2.49	- -
SD-202	A/V	11/20/2014	119	0	2 to 3	2.1	3.2	3.2	100%	1	-	PCB/MC	6.21	- -
SD-203	A/V	11/20/2014	120	0	0 to 1	4.2	2.8	2.8	100%	1	-	PCB/MC	8.89	- -
SD-203	A/V	11/20/2014	121	0	1 to 2	4.2	2.8	2.8	100%	1	-	PCB/MC	7.4	- -
SD-203	A/V	11/20/2014	122	0	2 to 2.8	4.2	2.8	2.8	100%	1	-	PCB/MC	0.048	- -
SD-204	V	11/20/2014	113	4.5	3.9 to 4.0	3.4	4.0	4.0	100%	2	-	PCB/MC	0.12	Sample collected at refusal and placed on hold.
SD-205	V	11/20/2014	114	4.5	3.3 to 3.4	3.6	3.4	3.4	100%	2	-	PCB/MC	0.526	- -
SD-205	V	11/20/2014	115	4.5	3 to 4	3.6	3.4	3.4	100%	2	-	GS/TOC	-	- -
SD-206	V	11/20/2014	111	2.5	2 to 3	3.4	3.4	3.4	100%	1	-	PCB/MC	5.8	- -
SD-206	V	11/20/2014	112	2.5	3 to 3.4	3.4	3.4	3.4	100%	1	-	PCB/MC	ND	- -
SD-207	V	11/20/2014	109	3.5	3 to 4	3.3	4.3	4.3	100%	1	MS/MSD	PCB/MC	ND	- -
SD-207	V	11/20/2014	110	3.5	4 to 4.3	3.3	4.3	4.3	100%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-208	V	11/19/2014	108	5.0	3.9 to 4.0	3.4	4.0	4.0	100%	3	-	PCB/MC	ND	Sample collected at refusal and placed on hold.
SD-209	T/A/V	11/19/2014	101	TBD	0 to 1	3.7	1.8	1.8	100%	3	-	PCB/MC	250	- -
SD-209	T/A/V	11/19/2014	102	TBD	0 to 1	3.7	1.8	1.8	100%	3	FD	PCB/MC	124	- -
SD-209	T/A/V	11/19/2014	103	TBD	1.0 to 1.9	3.7	1.8	1.8	100%	3	-	PCB/MC	268	- -
SD-210	T/A/V	11/19/2014	104	TBD	0 to 1	4.1	4.2	4.2	100%	1	-	PCB/MC	447	- -
SD-210	T/A/V	11/19/2014	105	TBD	1 to 2	4.1	4.2	4.2	100%	1	-	PCB/MC	560	- -
SD-210	T/A/V	11/19/2014	106	TBD	2 to 3	4.1	4.2	4.2	100%	1	-	PCB/MC	29.9	- -
SD-210	T/A/V	11/19/2014	107	TBD	3 to 4	4.1	4.2	4.2	100%	1	-	PCB/MC	0.28	- -
SD-211	T/A/V	11/19/2014	098	2.5	2 to 3	4.2	3.7	3.7	100%	1	-	PCB/MC	23.1	- -
SD-211	T/A/V	11/19/2014	099	2.5	3.0 to 3.6	4.2	3.7	3.7	100%	1	-	PCB/MC	1.5	- -
SD-212	T/A/V	11/19/2014	090	TBD	0 to 1	3.0	3.4	3.4	100%	1	MS/MSD	PCB/MC	390	- -
SD-212	T/A/V	11/19/2014	091	TBD	1 to 2	3.0	3.4	3.4	100%	1	-	PCB/MC	620	- -
SD-212	T/A/V	11/19/2014	092	TBD	2 to 3	3.0	3.4	3.4	100%	1	-	PCB/MC	134	- -
SD-212	T/A/V	11/19/2014	093	TBD	3 to 3.5	3.0	3.4	3.4	100%	1	-	PCB/MC	57	- -
SD-213	T/A/V	11/19/2014	094	TBD	0 to 1	3.9	3.4	3.4	100%	2	-	PCB/MC	240	- -
SD-213	T/A/V	11/19/2014	095	TBD	1 to 2	3.9	3.4	3.4	100%	2	-	PCB/MC	108	- -
SD-213	T/A/V	11/19/2014	096	TBD	2 to 3	3.9	3.4	3.4	100%	2	-	PCB/MC	7.2	- -
SD-213	T/A/V	11/19/2014	097	TBD	3 to 3.5	3.9	3.4	3.4	100%	2	-	PCB/MC	0.67	- -
SD-214	T/A/V	11/19/2014	085	TBD	0 to 1	3.4	3.3	3.3	100%	1	-	PCB/MC	780	- -
SD-214	T/A/V	11/19/2014	086	TBD	1 to 2	3.4	3.3	3.3	100%	1	-	PCB/MC	738	- -
SD-214	T/A/V	11/19/2014	087	TBD	2 to 3	3.4	3.3	3.3	100%	1	-	PCB/MC	160	- -
SD-214	T/A/V	11/19/2014	088	TBD	3 to 3.3	3.4	3.3	3.3	100%	1	-	PCB/MC	4.5	- -
SD-215	T/V	11/19/2014	089	5	3.9 to 4.0	3.8	4.0	4.0	100%	1	-	PCB/MC	1.67	Sample collected at refusal and placed on hold.
SD-216	T/V	11/19/2014	084	4.5	2.8 to 2.9	4.0	2.8	2.8	100%	3	-	PCB/MC	18.5	Sample collected at refusal and placed on hold.
SD-217	A/V	11/18/2014	079	4.5	3.8 to 3.9	3.4	3.9	3.9	100%	2	-	PCB/MC	20.4	Sampled collected at refusal and placed on hold.
SD-218	T	11/19/2014	081	TBD	0 to 1.0	3.8	2.0	2.0	100%	2	-	PCB/MC	170	- -
SD-218	T	11/19/2014	082	TBD	0 to 1.0	3.8	2.0	2.0	100%	2	FD	PCB/MC	52	- -
SD-218	T	11/19/2014	083	TBD	1.0 to 2.0	3.8	2.0	2.0	100%	2	-	PCB/MC	4.9	- -
SD-219	T	11/18/2014	070	TBD	0 to 1	3.2	4.1	4.1	100%	2	MS/MSD	PCB/MC	220	- -
SD-219	T	11/18/2014	071	TBD	1 to 2	3.2	4.1	4.1	100%	2	-	PCB/MC	50000	- -
SD-219	T	11/18/2014	072	TBD	2 to 3	3.2	4.1	4.1	100%	2	-	PCB/MC	700	- -
SD-219	T	11/18/2014	073	TBD	3 to 4	3.2	4.1	4.1	100%	2	-	PCB/MC	4770	- -
SD-220	T	11/18/2014	074	TBD	0 to 1	3.7	3.5	3.5	100%	2	-	PCB/MC	140	- -
SD-220	T	11/18/2014	075	TBD	1 to 2	3.7	3.5	3.5	100%	2	-	PCB/MC	7.7	- -
SD-220	T	11/18/2014	076	TBD	2 to 3	3.7	3.5	3.5	100%	2	-	PCB/MC	7.9	- -
SD-220	T	11/18/2014	077	TBD	3 to 3.6	3.7	3.5	3.5	100%	2	-	PCB/MC	24	- -
SD-220	T	11/18/2014	078	TBD	2.3 to 3.4	3.7	3.5	3.5	100%	2	-	GS/TOC	-	- -
SD-221	T	11/18/2014	061	TBD	0 to 1	3.1	1.3	1.3	100%	3	-	PCB/MC	30.4	- -

Table 4.1

Summary of Sediment Coring Activities
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Station ID	Sampling Reason (TSCA/Aerial/ Vertical)	Sample Date	Sample ID	Proposed Start Depth of Sampling (ft)	Actual Sample Interval (ft)	Water Depth (ft)	Penetration (ft)	Recovery (ft)	% Recovery	Number of Attempts	QA/QC	Analysis	Total PCBs (mg/kg)	Comments
SD-221	T	11/18/2014	062	TBD	0 to 1	3.1	1.3	1.3	100%	3	FD	PCB/MC	21	- -
SD-221	T	11/18/2014	063	TBD	1 to 1.4	3.1	1.3	1.3	100%	3	-	PCB/MC	53.8	- -
SD-221	T	11/18/2014	064	TBD	0 to 1.4	3.1	1.3	1.3	100%	3	-	GS/TOC	-	- -
SD-222	T	11/18/2014	066	TBD	0 to 1	4.3	3.4	3.4	100%	1	-	PCB/MC	0.14	- -
SD-222	T	11/18/2014	067	TBD	1 to 2	4.3	3.4	3.4	100%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-222	T	11/18/2014	068	TBD	2 to 3	4.3	3.4	3.4	100%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-222	T	11/18/2014	069	TBD	3 to 3.5	4.3	3.4	3.4	100%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-223	T	11/18/2014	055	TBD	0 to 1.0	3.3	1.9	1.9	100%	1	MS/MSD	PCB/MC	28	- -
SD-223	T	11/18/2014	056	TBD	1.0 to 1.9	3.3	1.9	1.9	100%	1	- -	PCB/MC	169	- -
SD-224	T	11/18/2014	057	TBD	0 to 1.0	4.2	3.3	3.3	100%	1	-	PCB/MC	6000	- -
SD-224	T	11/18/2014	058	TBD	1.0 to 2.0	4.2	3.3	3.3	100%	1	-	PCB/MC	93	- -
SD-224	T	11/18/2014	059	TBD	2.0 to 3.0	4.2	3.3	3.3	100%	1	-	PCB/MC	2.8	- -
SD-224	T	11/18/2014	060	TBD	3.0 to 3.3	4.2	3.3	3.3	100%	1	-	PCB/MC	0.424	- -
SD-225	T	11/18/2014	052	TBD	0 to 1.0	- -	1.4	1.4	100%	2	-	PCB/MC	3200	- -
SD-225	T	11/18/2014	053	TBD	1.0 to 1.5	4.7	1.4	1.4	100%	2	-	PCB/MC	38.8	- -
SD-226	T/V	11/18/2014	054	6.5	2 to 2.2	4.2	2.2	2.2	100%	2	-	PCB/MC	0.12	Sampled collected at refusal and placed on hold.
SD-227	V	11/16/2014	049	3.5	3.2 to 3.3	4.6	4.0	3.3	81%	2	-	PCB/MC	ND	Sampled collected at refusal and placed on hold.
SD-228	T/V	11/16/2014	050	4.5	2.9 to 3.0	5.1	3.5	3.0	86%	4	-	PCB/MC	0.22 P	Sampled collected at refusal and placed on hold.
SD-229	V	11/16/2014	048	2.5	2.3 to 2.4	5.0	3.0	2.4	81%	2	-	PCB/MC	0.762	Sampled collected at refusal and placed on hold.
SD-230	T/V	11/16/2014	051	3.5	2.4 to 2.5	4.2	3.3	3.0	90%	2	-	GS/TOC	-	Sample not collected for PCBs due to shallow core refusal. Sample collected for grain size/TOC only.
SD-231	V	11/16/2014	REFUSAL	2.5	REFUSAL	4.8	2.8	2.2	76%	3	-	-	-	Sample not collected due to shallow core refusal.
SD-232	A	11/16/2014	046	0	0 to 1	5.5	1.8	1.4	81%	3	-	PCB/MC	3.54	- -
SD-232	A	11/16/2014	047	0	1 to 1.5	5.5	1.8	1.4	81%	3	-	PCB/MC	0.322	- -
SD-233	A	11/16/2014	044	0	0 to 1	5.2	1.8	1.3	68%	4	-	PCB/MC	20.2	- -
SD-233	A	11/16/2014	045	0	1 to 1.25	5.2	1.8	1.3	68%	4	-	PCB/MC	0.442	- -
SD-234	A	11/15/2014	036	0	2.8 to 3	4.9	3.0	3.0	100%	2	-	GS/TOC	-	- -
SD-234	A	11/15/2014	037	0	0 to 1	4.9	3.0	3.0	100%	2	-	PCB/MC	4.48	- -
SD-234	A	11/15/2014	038	0	1 to 2	4.9	3.0	3.0	100%	2	-	PCB/MC	2.3	- -
SD-234	A	11/15/2014	039	0	2 to 3	4.9	3.0	3.0	100%	2	-	PCB/MC	ND	- -
SD-235	A	11/15/2014	040	0	0 to 1	2.9	2.0	2.0	100%	2	-	PCB/MC	ND	- -
SD-235	A	11/15/2014	041	0	0 to 1	2.9	2.0	2.0	100%	2	FD	PCB/MC	0.095 P	- -
SD-235	A	11/15/2014	042	0	1 to 2	2.9	2.0	2.0	100%	2	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-236	A	11/15/2014	023	0	0 to 1.0	2.9	6.9	5.8	84%	1	-	PCB/MC	1.21	- -
SD-236	A	11/15/2014	024	0	0 to 1.0	2.9	6.9	5.8	84%	1	FD	PCB/MC	1.1	- -
SD-236	A	11/15/2014	025	0	1.0 to 2.0	2.9	6.9	5.8	84%	1	-	PCB/MC	12.2	- -
SD-236	A	11/15/2014	026	0	2.0 to 3.0	2.9	6.9	5.8	84%	1	-	PCB/MC	13.6	- -
SD-236	A	11/15/2014	027	0	3.0 to 4.0	2.9	6.9	5.8	84%	1	-	PCB/MC	0.14	- -
SD-236	A	11/15/2014	028	0	4.0 to 5.0	2.9	6.9	5.8	84%	1	-	PCB/MC	0.059	- -
SD-236	A	11/15/2014	029	0	5.0 to 5.9	2.9	6.9	5.8	84%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-237	A	11/15/2014	030	0	0 to 1	3.6	5.3	3.6	67%	3	-	PCB/MC	33.9	- -
SD-237	A	11/15/2014	031	0	1 to 2	3.6	5.3	3.6	67%	3	-	PCB/MC	1.27	- -
SD-237	A	11/15/2014	032	0	2 to 3	3.6	5.3	3.6	67%	3	-	PCB/MC	ND	- -
SD-237	A	11/15/2014	033	0	3 to 4	3.6	5.3	3.6	67%	3	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-237	A	11/15/2014	034	0	0 to 1	3.6	5.3	3.6	67%	3	-	GS/TOC	-	- -
SD-238	A	11/15/2014	012	0	0 to 1	1.4	5.7	5.0	88%	1	MS/MSD	PCB/MC	0.91	- -
SD-238	A	11/15/2014	013	0	1 to 2	1.4	5.7	5.0	88%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-238	A	11/15/2014	014	0	2 to 3	1.4	5.7	5.0	88%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-238	A	11/15/2014	015	0	3 to 4	1.4	5.7	5.0	88%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-238	A	11/15/2014	016	0	4 to 5	1.4	5.7	5.0	88%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-239	A	11/15/2014	017	0	0 to 1.0	1.6	6.1	5.6	92%	1	-	PCB/MC	1.32	- -
SD-239	A	11/15/2014	018	0	1.0 to 2.0	1.6	6.1	5.6	92%	1	-	PCB/MC	0.099	- -
SD-239	A	11/15/2014	019	0	2.0 to 3.0	1.6	6.1	5.6	92%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-239	A	11/15/2014	020	0	3.0 to 4.0	1.6	6.1	5.6	92%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-239	A	11/15/2014	021	0	4.0 to 5.0	1.6	6.1	5.6	92%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.

Table 4.1

Summary of Sediment Coring Activities
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Station ID	Sampling Reason (TSCA/Aerial/ Vertical)	Sample Date	Sample ID	Proposed Start Depth of Sampling (ft)	Actual Sample Interval (ft)	Water Depth (ft)	Penetration (ft)	Recovery (ft)	% Recovery	Number of Attempts	QA/QC	Analysis	Total PCBs (mg/kg)	Comments
SD-239	A	11/15/2014	022	0	5.0 to 5.6	1.6	6.1	5.6	92%	1	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-240	A	11/14/2014	001	0	0 to 1	1.5	4.3	4.3	100%	3	-	PCB/MC	1.78	- -
SD-240	A	11/14/2014	002	0	0 to 1	1.5	4.3	4.3	100%	3	FD	PCB/MC	2.32	- -
SD-240	A	11/14/2014	003	0	1 to 2	1.5	4.3	4.3	100%	3	-	PCB/MC	0.095	- -
SD-240	A	11/14/2014	004	0	2 to 3	1.5	4.3	4.3	100%	3	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-240	A	11/14/2014	005	0	3 to 4	1.5	4.3	4.3	100%	3	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-241	V	11/14/2014	011	4.5	4.5 to 5.1	1.8	5.3	5.3	100%	2	-	PCB/MC	ND	- -
SD-242	-	11/14/2014	006	0	0 to 1	3.7	5.1	5.1	100%	2	-	PCB/MC	14.1	- -
SD-242	-	11/14/2014	007	0	1 to 2	3.7	5.1	5.1	100%	2	-	PCB/MC	1.29	- -
SD-242	-	11/14/2014	008	0	2 to 3	3.7	5.1	5.1	100%	2	-	PCB/MC	0.12	- -
SD-242	-	11/14/2014	009	0	3 to 4	3.7	5.1	5.1	100%	2	-	PCB/MC	-	Extract placed on hold; however, analysis not required.
SD-242	-	11/14/2014	010	0	4 to 5	3.7	5.1	5.1	100%	2	-	PCB/MC	-	Extract placed on hold; however, analysis not required.

Analysis:

PCB/MC - PCBs; Moisture Content
GS/TOC - Grain Size; Total Organic Carbon

Notes:

ft	feet
EB	Equipment Blank
FD	Field Duplicate
MS/MSD	Matrix Spike/Matrix Spike Duplicate
PCB	Polychlorinated Biphenyl
TBD	To be determined
TOC	Total Organic Carbon
TSCA	Substances Control Act
1.35	Result exceeds SCG of 1 mg/kg total PCBs
53.8	Result exceeds 50 mg/kg total PCBs

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				**SD-200**	**SD-201**	**SD-201**	**SD-202**	**SD-202**	**SD-202**	**SD-203**	**SD-203**
Sample ID:				**SD-80987-112014-DD-126**	**SD-80987-112014-DD-123**	**SD-80987-112014-DD-124**	**SD-80987-112014-DD-117**	**SD-80987-112014-DD-118**	**SD-80987-112014-DD-119**	**SD-80987-112014-DD-120**	**SD-80987-112014-DD-121**
Sample Date:				**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**
Sample Depth:				**4-4.3 ft BGS**	**0-1 ft BGS**	**1-2 ft BGS**	**0-1 ft BGS**	**1-2 ft BGS**	**2-3 ft BGS**	**0-1 ft BGS**	**1-2 ft BGS**
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.044 U	0.39 U	0.041 U	0.36 U	0.36 U	0.67 U	0.7 U	0.63 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.044 U	0.39 U	0.041 U	0.36 U	0.36 U	0.67 U	0.7 U	0.63 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.044 U	0.39 U	0.041 U	0.36 U	0.36 U	0.67 U	0.7 U	0.63 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	0.044 U	2.4	0.19	2.9	1.9 J	5.4	7.9 J	5.6
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.044 U	0.39 U	0.041 U	0.36 U	0.36 U	0.67 U	0.7 U	0.63 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.044 U	0.4 J	0.068	0.6 J	0.59	0.81 J	0.99 J	1.8
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.044 U	0.39 U	0.041 U	0.36 U	0.36 U	0.67 U	0.7 U	0.63 U
Total PCBs (calculated)	mg/kg	1	50	0.044 U	**2.8**[a]	0.258	**3.5**[a]	**2.49**[a]	**6.21**[a]	**8.89**[a]	**7.4**[a]
General Chemistry											
Percent moisture	%	-	-	26	58	20	54	54	51	53	48
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentration.
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				**SD-203**	**SD-204**	**SD-205**	**SD-205**	**SD-206**	**SD-206**	**SD-207**	**SD-208**
Sample ID:				**SD-80987-112014-DD-122**	**SD-80987-112014-DD-113**	**SD-80987-112014-DD-114**	**SD-80987-112014-DD-115**	**SD-80987-112014-DD-111**	**SD-80987-112014-DD-112**	**SD-80987-112014-DD-109**	**SD-80987-111914-DD-108**
Sample Date:				**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/19/2014**
Sample Depth:				**2-2.8 ft BGS**	**3.9-4 ft BGS**	**3.3-3.4 ft BGS**	**3-4 ft BGS**	**2-3 ft BGS**	**3-3.4 ft BGS**	**3-4 ft BGS**	**3.9-4 ft BGS**
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.043 U	0.052 U	0.039 U	-	0.59 U	0.041 U	0.056 U	0.048 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.043 U	0.052 U	0.039 U	-	0.59 U	0.041 U	0.056 U	0.048 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.043 U	0.052 U	0.039 U	-	0.59 U	0.041 U	0.056 U	0.048 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	0.048	0.12	0.46	-	4.4	0.041 U	0.056 U	0.048 U
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.043 U	0.052 U	0.039 U	-	0.59 U	0.041 U	0.056 U	0.048 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.043 U	0.052 U	0.066 J	-	1.4	0.041 U	0.056 U	0.048 U
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.043 U	0.052 U	0.039 U	-	0.59 U	0.041 U	0.056 U	0.048 U
Total PCBs (calculated)	mg/kg	1	50	0.048	0.12	0.526	N/A	**5.8**[a]	0.041 U	0.056 U	0.048 U
General Chemistry											
Percent moisture	%	-	-	23	37	17	-	44	21	41	33
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	24500	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				SD-209	SD-209	SD-209	SD-210	SD-210	SD-210	SD-210	SD-211
Sample ID:				SD-80987-111914-DD-101	SD-80987-111914-DD-102	SD-80987-111914-DD-103	SD-80987-111914-DD-104	SD-80987-111914-DD-105	SD-80987-111914-DD-106	SD-80987-111914-DD-107	SD-80987-111914-DD-098
Sample Date:				11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014
Sample Depth:				0-1 ft BGS	0-1 ft BGS Duplicate	1-1.9 ft BGS	0-1 ft BGS	1-2 ft BGS	2-3 ft BGS	3-4 ft BGS	2-3 ft BGS
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	17 U	14 U	23 U	59 U	65 U	2.8 U	0.11 U	1.5 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	17 U	14 U	23 U	59 U	65 U	2.8 U	0.11 U	1.5 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	17 U	14 U	23 U	59 U	65 U	2.8 U	0.11 U	1.5 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	220	110 J	230 J	380 J	430 J	25 J	0.28 J	17
Aroclor-1248 (PCB-1248)	mg/kg	-	-	17 U	14 U	23 U	59 U	65 U	2.8 U	0.11 U	1.5 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	30 J	14 J	38 J	67 J	130 J	4.9 J	0.11 U	6.1
Aroclor-1260 (PCB-1260)	mg/kg	-	-	17 U	14 U	23 U	59 U	65 U	2.8 U	0.11 U	1.5 U
Total PCBs (calculated)	mg/kg	1	50	**250[ab]**	**124[ab]**	**268[ab]**	**447[ab]**	**560[ab]**	**29.9[a]**	0.28	**23.1[a]**
General Chemistry											
Percent moisture	%	-	-	52	52	44	45	50	41	38	45
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				SD-211	SD-212	SD-212	SD-212	SD-212	SD-213	SD-213	SD-213
Sample ID:				SD-80987-111914-DD-099	SD-80987-111914-DD-090	SD-80987-111914-DD-091	SD-80987-111914-DD-092	SD-80987-111914-DD-093	SD-80987-111914-DD-094	SD-80987-111914-DD-095	SD-80987-111914-DD-096
Sample Date:				11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014
Sample Depth:				3-3.6 ft BGS	0-1 ft BGS	1-2 ft BGS	2-3 ft BGS	3-3.5 ft BGS	0-1 ft BGS	1-2 ft BGS	2-3 ft BGS
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.44 U	59 U	64 U	13 U	5.3 U	46 U	13 U	1 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.44 U	59 U	64 U	13 U	5.3 U	46 U	13 U	1 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.44 U	59 U	64 U	13 U	5.3 U	46 U	13 U	1 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	1.5	390	490	110	57	240	90	7.2
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.44 U	59 U	64 U	13 U	5.3 U	46 U	13 U	1 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.44 U	59 U	130	24 J	5.3 U	46 U	18 J	1 U
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.44 U	59 U	64 U	13 U	5.3 U	46 U	13 U	1 U
Total PCBs (calculated)	mg/kg	1	50	1.5[a]	390[ab]	620[ab]	134[ab]	57[ab]	240[ab]	108[ab]	7.2[a]
General Chemistry											
Percent moisture	%	-	-	25	45	49	50	38	30	48	36
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				SD-213	SD-214	SD-214	SD-214	SD-214	SD-215	SD-216	SD-217
Sample ID:				SD-80987-111914-DD-097	SD-80987-111914-DD-085	SD-80987-111914-DD-086	SD-80987-111914-DD-087	SD-80987-111914-DD-088	SD-80987-111914-DD-089	SD-80987-111914-DD-084	SD-80987-111814-DD-079
Sample Date:				11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/18/2014
Sample Depth:				3-3.5 ft BGS	0-1 ft BGS	1-2 ft BGS	2-3 ft BGS	3-3.3 ft BGS	3.9-4 ft BGS	2.8-2.9 ft BGS	3.8-3.9 ft BGS
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.44 U	53 U	50 U	32 U	0.65 U	0.13 U	2.2 U	1.4 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.44 U	53 U	50 U	32 U	0.65 U	0.13 U	2.2 U	1.4 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.44 U	53 U	50 U	32 U	0.65 U	0.13 U	2.2 U	1.4 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	0.67	690	650	160	3.4	1.4	14	1.4 U
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.44 U	53 U	50 U	32 U	0.65 U	0.13 U	2.2 U	1.4 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.44 U	90 J	88 J	32 U	1.8	0.27	4.5	14
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.44 U	53 U	50 U	32 U	0.65 U	0.13 U	2.2 U	6.4
Total PCBs (calculated)	mg/kg	1	50	0.67	780[ab]	738[ab]	160[ab]	5.2[a]	1.67[a]	18.5[a]	20.4[a]
General Chemistry											
Percent moisture	%	-	-	27	38	35	48	49	48	25	43
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				SD-218	SD-218	SD-218	SD-219	SD-219	SD-219	SD-219	SD-220
Sample ID:				SD-80987-111914-DD-081	SD-80987-111914-DD-082	SD-80987-111914-DD-083	SD-80987-111814-DD-070	SD-80987-111814-DD-071	SD-80987-111814-DD-072	SD-80987-111814-DD-073	SD-80987-111814-DD-074
Sample Date:				11/19/2014	11/19/2014	11/19/2014	11/18/2014	11/18/2014	11/18/2014	11/18/2014	11/18/2014
Sample Depth:				0-1 ft BGS	0-1 ft BGS Duplicate	1-2 ft BGS	0-1 ft BGS	1-2 ft BGS	2-3 ft BGS	3-4 ft BGS	0-1 ft BGS
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	23 U	8.9 U	0.92 U	24 U	9900 U	52 U	460 U	43 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	23 U	8.9 U	0.92 U	24 U	9900 U	52 U	460 U	43 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	23 U	8.9 U	0.92 U	24 U	9900 U	52 U	460 U	43 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	170 J	52 J	4.9	220 J	50000	580	4300	140 J
Aroclor-1248 (PCB-1248)	mg/kg	-	-	23 U	8.9 U	0.92 U	24 U	9900 U	52 U	460 U	43 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	23 U	8.9 U	0.92 U	24 U	9900 U	120 J	470	43 U
Aroclor-1260 (PCB-1260)	mg/kg	-	-	23 U	8.9 U	0.92 U	24 U	9900 U	52 U	460 U	43 U
Total PCBs (calculated)	mg/kg	1	50	170[ab]	52[ab]	4.9[a]	220[ab]	50000[ab]	700[ab]	4770[ab]	140[ab]
General Chemistry											
Percent moisture	%	-	-	28	27	29	31	34	37	28	25
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				**SD-220**	**SD-220**	**SD-220**	**SD-220**	**SD-221**	**SD-221**	**SD-221**	**SD-221**
Sample ID:				**SD-80987-111814-DD-075**	**SD-80987-111814-DD-076**	**SD-80987-111814-DD-077**	**SD-80987-111814-DD-078**	**SD-80987-111814-DD-061**	**SD-80987-111814-DD-062**	**SD-80987-111814-DD-063**	**SD-80987-111814-DD-064**
Sample Date:				**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**
Sample Depth:				**1-2 ft BGS**	**2-3 ft BGS**	**3-3.6 ft BGS**	**2.3-3.4 ft BGS**	**0-1 ft BGS**	**0-1 ft BGS Duplicate**	**1-1.4 ft BGS**	**0-1.4 ft BGS**
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.95 U	0.82 U	4.1 U	-	4.4 U	4.1 U	4.2 U	-
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.95 U	0.82 U	4.1 U	-	4.4 U	4.1 U	4.2 U	-
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.95 U	0.82 U	4.1 U	-	4.4 U	4.1 U	4.2 U	-
Aroclor-1242 (PCB-1242)	mg/kg	-	-	7.7	7.9	24	-	25 J	21 J	44 J	-
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.95 U	0.82 U	4.1 U	-	4.4 U	4.1 U	4.2 U	-
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.95 U	0.82 U	4.1 U	-	5.4	4.1 U	9.8	-
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.95 U	0.82 U	4.1 U	-	4.4 U	4.1 U	4.2 U	-
Total PCBs (calculated)	mg/kg	1	50	**7.7[a]**	**7.9[a]**	**24[a]**	N/A	**30.4[a]**	**21[a]**	**53.8[ab]**	N/A
General Chemistry											
Percent moisture	%	-	-	31	21	20	-	26	21	21	-
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	1650	-	-	-	18100

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				**SD-222**	**SD-223**	**SD-223**	**SD-224**	**SD-224**	**SD-224**	**SD-224**	**SD-225**
Sample ID:				**SD-80987-111814-DD-066**	**SD-80987-111814-DD-055**	**SD-80987-111814-DD-056**	**SD-80987-111814-DD-057**	**SD-80987-111814-DD-058**	**SD-80987-111814-DD-059**	**SD-80987-111814-DD-060**	**SD-80987-111814-DD-052**
Sample Date:				**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**	**11/18/2014**
Sample Depth:				**0-1 ft BGS**	**0-1 ft BGS**	**1-1.9 ft BGS**	**0-1 ft BGS**	**1-2 ft BGS**	**2-3 ft BGS**	**3-3.3 ft BGS**	**0-1 ft BGS**
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.043 U	8 U	22 U	460 U	9.5 U	0.45 U	0.039 U	300 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.043 U	8 U	22 U	460 U	9.5 U	0.45 U	0.039 U	300 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.043 U	8 U	22 U	460 U	9.5 U	0.45 U	0.039 U	300 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	0.14 J	28 J	140	5500	79 J	2.8 J	0.38	3200 J
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.043 U	8 U	22 U	460 U	9.5 U	0.45 U	0.039 U	300 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.043 U	8 U	29	500 NJ	14	0.45 U	0.044	300 U
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.043 U	8 U	22 U	460 U	9.5 U	0.45 U	0.039 U	300 U
Total PCBs (calculated)	mg/kg	1	50	0.14	**28[a]**	**169[ab]**	**6000[ab]**	**93[ab]**	**2.8[a]**	0.424	**3200[ab]**
General Chemistry											
Percent moisture	%	-	-	25	19	25	29	32	26	17	46
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				**SD-225**	**SD-226**	**SD-227**	**SD-228**	**SD-229**	**SD-230**	**SD-232**	**SD-232**
Sample ID:				**SD-80987-111814-DD-053**	**SD-80987-111814-DD-054**	**SD-80987-111614-DD-049**	**SD-80987-111614-DD-050**	**SD-80987-111614-DD-048**	**SD-80987-111614-DD-051**	**SD-80987-111614-DD-046**	**SD-80987-111614-DD-047**
Sample Date:				**11/18/2014**	**11/18/2014**	**11/16/2014**	**11/16/2014**	**11/16/2014**	**11/16/2014**	**11/16/2014**	**11/16/2014**
Sample Depth:				**1-1.5 ft BGS**	**2-2.2 ft BGS**	**3.2-3.3 ft BGS**	**2.9-3 ft BGS**	**2.3-2.4 ft BGS**	**2.4-2.5 ft BGS**	**0-1 ft BGS**	**1-1.5 ft BGS**
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	4.5 U	0.04 U	0.038 U	0.04 U	0.08 U	-	0.31 U	0.042 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	4.5 U	0.04 U	0.038 U	0.04 U	0.08 U	-	0.31 U	0.042 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	4.5 U	0.04 U	0.038 U	0.04 U	0.08 U	-	0.31 U	0.042 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	32 J	0.12	0.038 U	0.22	0.67 J	-	3	0.27
Aroclor-1248 (PCB-1248)	mg/kg	-	-	4.5 U	0.04 U	0.038 U	0.04 U	0.08 U	-	0.31 U	0.042 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	6.8 J	0.04 U	0.038 U	0.04 U	0.092 J	-	0.54 J	0.052 J
Aroclor-1260 (PCB-1260)	mg/kg	-	-	4.5 U	0.04 U	0.038 U	0.04 U	0.08 U	-	0.31 U	0.042 U
Total PCBs (calculated)	mg/kg	1	50	**38.8**[a]	0.12	0.038 U	0.22	0.762	N/A	**3.54**[a]	0.322
General Chemistry											
Percent moisture	%	-	-	27	19	15	19	18	-	47	22
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	3170	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				**SD-233**	**SD-233**	**SD-234**	**SD-234**	**SD-234**	**SD-234**	**SD-235**	**SD-235**
Sample ID:				**SD-80987-111614-DD-044**	**SD-80987-111614-DD-045**	**SD-80987-111514-DD-036**	**SD-80987-111514-DD-037**	**SD-80987-111514-DD-038**	**SD-80987-111514-DD-039**	**SD-80987-111514-DD-040**	**SD-80987-111514-DD-041**
Sample Date:				**11/16/2014**	**11/16/2014**	**11/15/2014**	**11/15/2014**	**11/15/2014**	**11/15/2014**	**11/15/2014**	**11/15/2014**
Sample Depth:				**0-1 ft BGS**	**1-1.25 ft BGS**	**2.8-3 ft BGS**	**0-1 ft BGS**	**1-2 ft BGS**	**2-3 ft BGS**	**0-1 ft BGS**	**0-1 ft BGS Duplicate**
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	2.8 U	0.046 U	-	0.42 U	0.51 U	0.039 U	0.045 U	0.046 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	2.8 U	0.046 U	-	0.42 U	0.51 U	0.039 U	0.045 U	0.046 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	2.8 U	0.046 U	-	0.42 U	0.51 U	0.039 U	0.045 U	0.046 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	17	0.37 J	-	3.8 J	2.3	0.039 U	0.045 U	0.095 J
Aroclor-1248 (PCB-1248)	mg/kg	-	-	2.8 U	0.046 U	-	0.42 U	0.51 U	0.039 U	0.045 U	0.046 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	3.2 J	0.072	-	0.68 J	0.51 U	0.039 U	0.045 U	0.046 U
Aroclor-1260 (PCB-1260)	mg/kg	-	-	2.8 U	0.046 U	-	0.42 U	0.51 U	0.039 U	0.045 U	0.046 U
Total PCBs (calculated)	mg/kg	1	50	**20.2[a]**	0.442	N/A	**4.48[a]**	**2.3[a]**	0.039 U	0.045 U	0.095
General Chemistry											
Percent moisture	%	-	-	53	29	-	60	35	16	28	29
Total organic carbon (TOC)	mg/kg	-	-	-	-	16100	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				SD-236	SD-236	SD-236	SD-236	SD-236	SD-236	SD-237	SD-237
Sample ID:				SD-80987-111514-DD-023	SD-80987-111514-DD-024	SD-80987-111514-DD-025	SD-80987-111514-DD-026	SD-80987-111514-DD-027	SD-80987-111514-DD-028	SD-80987-111514-DD-030	SD-80987-111514-DD-031
Sample Date:				11/15/2014	11/15/2014	11/15/2014	11/15/2014	11/15/2014	11/15/2014	11/15/2014	11/15/2014
Sample Depth:				0-1 ft BGS	0-1 ft BGS Duplicate	1-2 ft BGS	2-3 ft BGS	3-4 ft BGS	4-5 ft BGS	0-1 ft BGS	1-2 ft BGS
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.15 U	0.15 U	1.3 U	1.3 U	0.049 U	0.052 U	3.3 U	0.1 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.15 U	0.15 U	1.3 U	1.3 U	0.049 U	0.052 U	3.3 U	0.1 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.15 U	0.15 U	1.3 U	1.3 U	0.049 U	0.052 U	3.3 U	0.1 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	1	0.89	11	11	0.14 J	0.059	29	1.1
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.15 U	0.15 U	1.3 U	1.3 U	0.049 UJ	0.052 U	3.3 U	0.1 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.21	0.21	1.2 J	2.6	0.049 UJ	0.052 U	4.9 J	0.17 J
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.15 U	0.15 U	1.3 U	1.3 U	0.049 UJ	0.052 U	3.3 U	0.1 U
Total PCBs (calculated)	mg/kg	1	50	1.21[a]	1.1[a]	12.2[a]	13.6[a]	0.14	0.059	33.9[a]	1.27[a]
General Chemistry											
Percent moisture	%	-	-	56	57	49	47	34	37	51	36
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				SD-237	SD-237	SD-238	SD-239	SD-239	SD-240	SD-240	SD-240
Sample ID:				SD-80987-111514-DD-032	SD-80987-111514-DD-034	SD-80987-111514-DD-012	SD-80987-111514-DD-017	SD-80987-111514-DD-018	SD-80987-111414-DD-001	SD-80987-111414-DD-002	SD-80987-111414-DD-003
Sample Date:				11/15/2014	11/15/2014	11/15/2014	11/15/2014	11/15/2014	11/14/2014	11/14/2014	11/14/2014
Sample Depth:				2-3 ft BGS	0-1 ft BGS	0-1 ft BGS	0-1 ft BGS	1-2 ft BGS	0-1 ft BGS	0-1 ft BGS Duplicate	1-2 ft BGS
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b								
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.043 U	-	0.058 U	0.13 U	0.051 U	0.3 U	0.3 U	0.055 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.043 U	-	0.058 U	0.13 U	0.051 U	0.3 U	0.3 U	0.055 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.043 U	-	0.058 U	0.13 U	0.051 U	0.3 U	0.3 U	0.055 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	0.043 U	-	0.67	1.1	0.099	1.3	1.7	0.055 UJ
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.043 U	-	0.058 U	0.13 U	0.051 U	0.3 U	0.3 U	0.055 UJ
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.043 U	-	0.24	0.22 J	0.051 U	0.48	0.62	0.095 J
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.043 U	-	0.058 U	0.13 U	0.051 U	0.3 U	0.3 U	0.055 UJ
Total PCBs (calculated)	mg/kg	1	50	0.043 U	N/A	0.91	1.32[a]	0.099	1.78[a]	2.32[a]	0.095
General Chemistry											
Percent moisture	%	-	-	25	-	44	48	37	45	46	40
Total organic carbon (TOC)	mg/kg	-	-	-	86700	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable

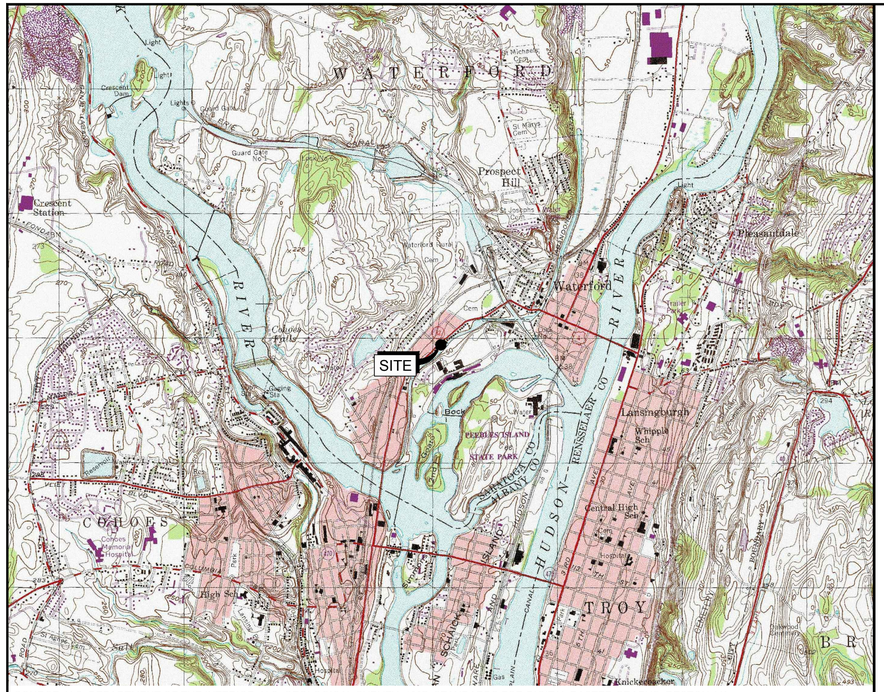
Table 4.2

PCB Sediment Analytical Results (OU-3 Sediments)
Preliminary Design Report
Friedrichsohn Cooperage Site
153-155 Saratoga Avenue, Waterford, NY

Sample Location:				**SD-241**	**SD-242**	**SD-242**	**SD-242**
Sample ID:				**SD-80987-111414-DD-011**	**SD-80987-111414-DD-006**	**SD-80987-111414-DD-007**	**SD-80987-111414-DD-008**
Sample Date:				**11/14/2014**	**11/14/2014**	**11/14/2014**	**11/14/2014**
Sample Depth:				**4.5-5.1 ft BGS**	**0-1 ft BGS**	**1-2 ft BGS**	**2-3 ft BGS**
Parameters	**Units**	**Criteria 1** a	**Criteria 2** b				
PCBs							
Aroclor-1016 (PCB-1016)	mg/kg	-	-	0.05 U	1.2 U	0.12 U	0.052 U
Aroclor-1221 (PCB-1221)	mg/kg	-	-	0.05 U	1.2 U	0.12 U	0.052 U
Aroclor-1232 (PCB-1232)	mg/kg	-	-	0.05 U	1.2 U	0.12 U	0.052 U
Aroclor-1242 (PCB-1242)	mg/kg	-	-	0.05 U	12	0.8	0.12 J
Aroclor-1248 (PCB-1248)	mg/kg	-	-	0.05 U	1.2 U	0.12 U	0.052 U
Aroclor-1254 (PCB-1254)	mg/kg	-	-	0.05 U	2.1 J	0.32	0.052 U
Aroclor-1260 (PCB-1260)	mg/kg	-	-	0.05 U	1.2 U	0.17	0.052 U
Total PCBs (calculated)	mg/kg	1	50	0.05 U	**14.1**[a]	**1.29**[a]	0.12
General Chemistry							
Percent moisture	%	-	-	34	47	45	38
Total organic carbon (TOC)	mg/kg	-	-	-	-	-	-

Notes:

BGS	Below Ground Surface
ft	feet
PCBs	Polychlorinated Biphenyls
U	Not detected at the associated reporting limit.
J	Estimated concentration.
UJ	Not detected; associated reporting limit is estimated.
NJ	Tentatively identified compound, estimated concentratic
NA	Not Applicable



SOURCE: U.S. DEPARTMENT OF THE INTERIOR, U.S. GEOLOGICAL SURVEY, 1997, STANDARDS FOR DIGITAL RASTER GRAPHS: RESTON, VA.

KEY MAP

DRAWING INDEX

DRAWING NO.	TITLE
G-01	COVER SHEET
C-01	EXISTING CONDITION OVERALL SITE PLAN
C-02	EXISTING CONDITION SITE PLAN
C-03	SITE WORKS PHASE I - OU3 SEDIMENTS/SOURCE SOILS
C-04	SITE PREPARATION PLAN PHASE I - OU3 SEDIMENT/SOURCE SOILS
C-05	CANAL SEDIMENT EXCAVATION OVERALL PLAN LAYOUT
C-06	CANAL SEDIMENT EXCAVATION PLAN 1 OF 4
C-07	CANAL SEDIMENT EXCAVATION PLAN 2 OF 4
C-08	CANAL SEDIMENT EXCAVATION PLAN 3 OF 4
C-09	CANAL SEDIMENT EXCAVATION PLAN 4 OF 4
C-10	CANAL SEDIMENT EXCAVATION CROSS SECTIONS PAGE 1 OF 3
C-11	CANAL SEDIMENT EXCAVATION CROSS SECTIONS PAGE 2 OF 3
C-12	CANAL SEDIMENT EXCAVATION CROSS SECTIONS PAGE 3 OF 3
C-13	PHASE II - EROSION AND SEDIMENT CONTROL SITE PLAN
C-14	EROSION AND SEDIMENT CONTROL MEASURES DETAILS
C-15	SOURCE AREA OU1 IMPACTED SOIL EXCAVATION (0-2 ft. BGS)
C-16	SOURCE AREA OU3 IMPACTED SOIL EXCAVATION (0-1 ft. BGS)
C-17	SOURCE AREA OU3 IMPACTED SOIL EXCAVATION (1-2 ft. BGS)
C-18	SOURCE AREA OU3 IMPACTED SOIL EXCAVATION (2-4 ft. BGS)
C-19	SOURCE AREA OU3 IMPACTED SOIL EXCAVATION (4-6 ft. BGS)
C-20	SOURCE AREA OU3 IMPACTED SOIL EXCAVATION (6-8 ft. BGS)
C-21	SOURCE AREA OU3 IMPACTED SOIL EXCAVATION (8 ft. BGS - BEDROCK)
C-22	FINAL GRADING SITE PLAN
C-23	DETAILS I
C-24	DETAILS II
IC-01	WASTE WATER TREATMENT FACILITY

PRELIMINARY REMEDIAL DESIGN REPORT

FRIEDRICHSOHN COOPERAGE SITE 153-155 SARATOGA AVE., WATERFORD, NEW YORK

GHD

Nº	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 CONTOUR
- VEGETATION
- SAN SANITARY SEWER
- STM STORM SEWER
- W WATER MAIN
- OE ELECTRICAL OVERHEAD LINE
- G GAS MAIN
- X FENCE LINE (APPROXIMATE)
- TREE
- C.B. CATCH BASIN
- M.H. MAN HOLE
- HYD. HYDRANT
- U.P. UTILITY POLE
- W.V. WATER VALVE
- MW-5 MONITORING WELL
- BM BENCHMARK

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

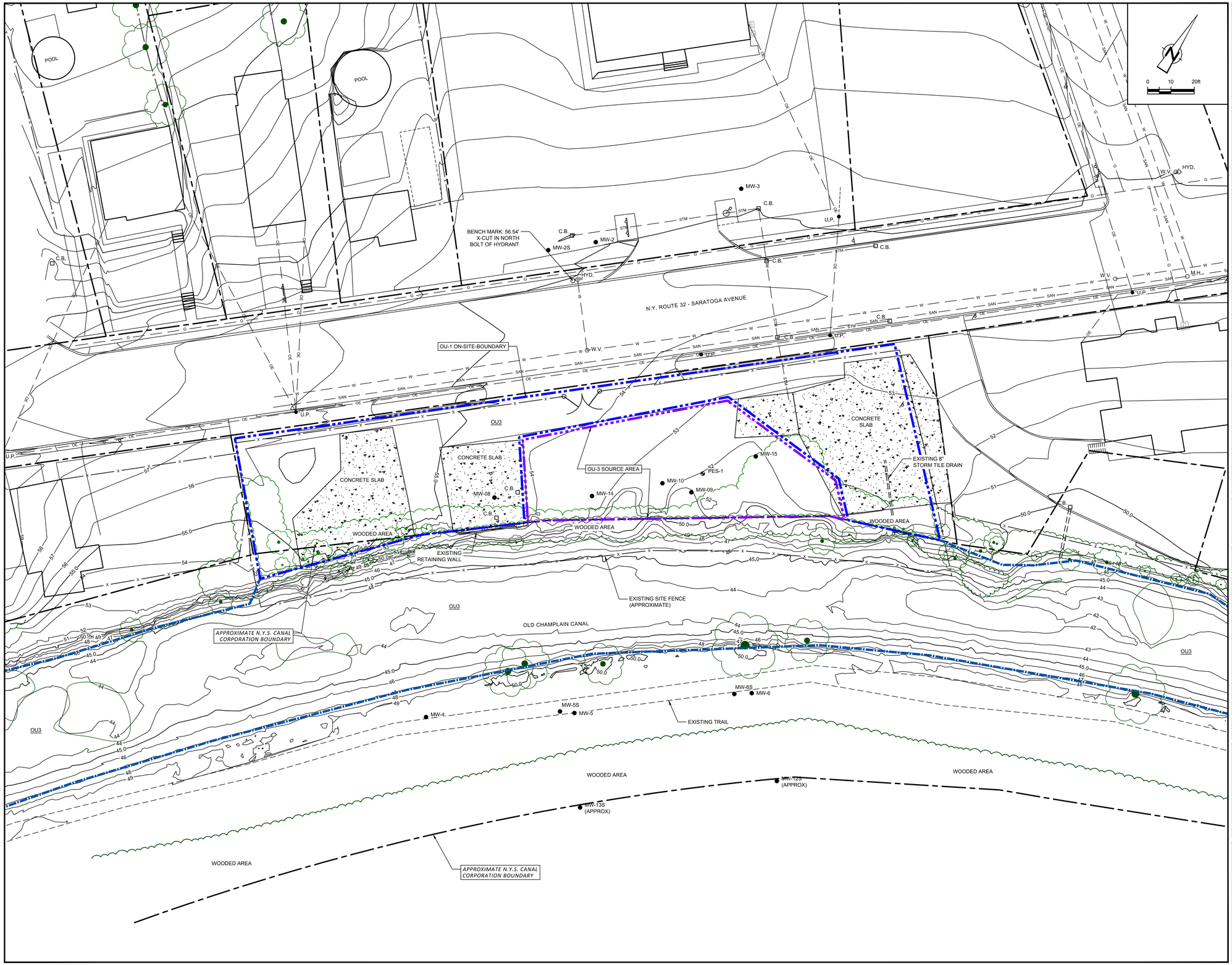
EXISTING CONDITION OVERALL SITE PLAN

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 80'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-01

80987-20(007)CI-WA022 MAR 21/2016



No	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

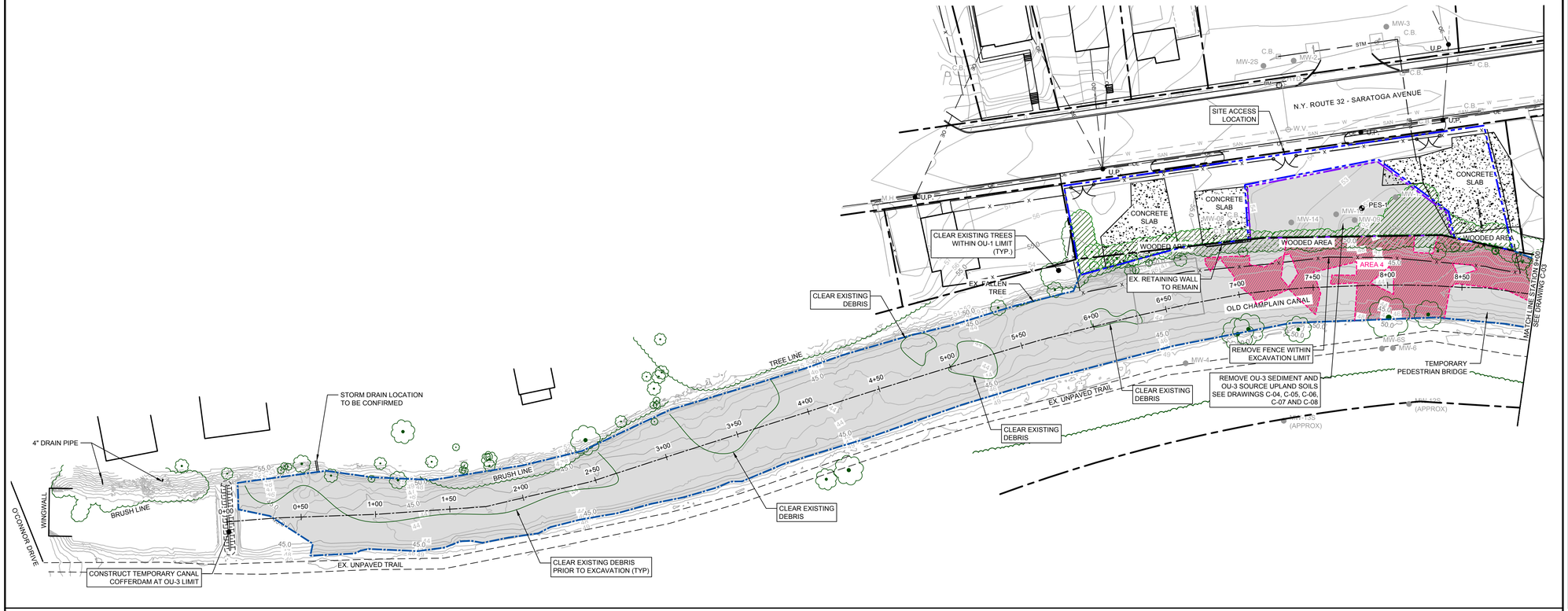
EXISTING CONDITION SITE PLAN

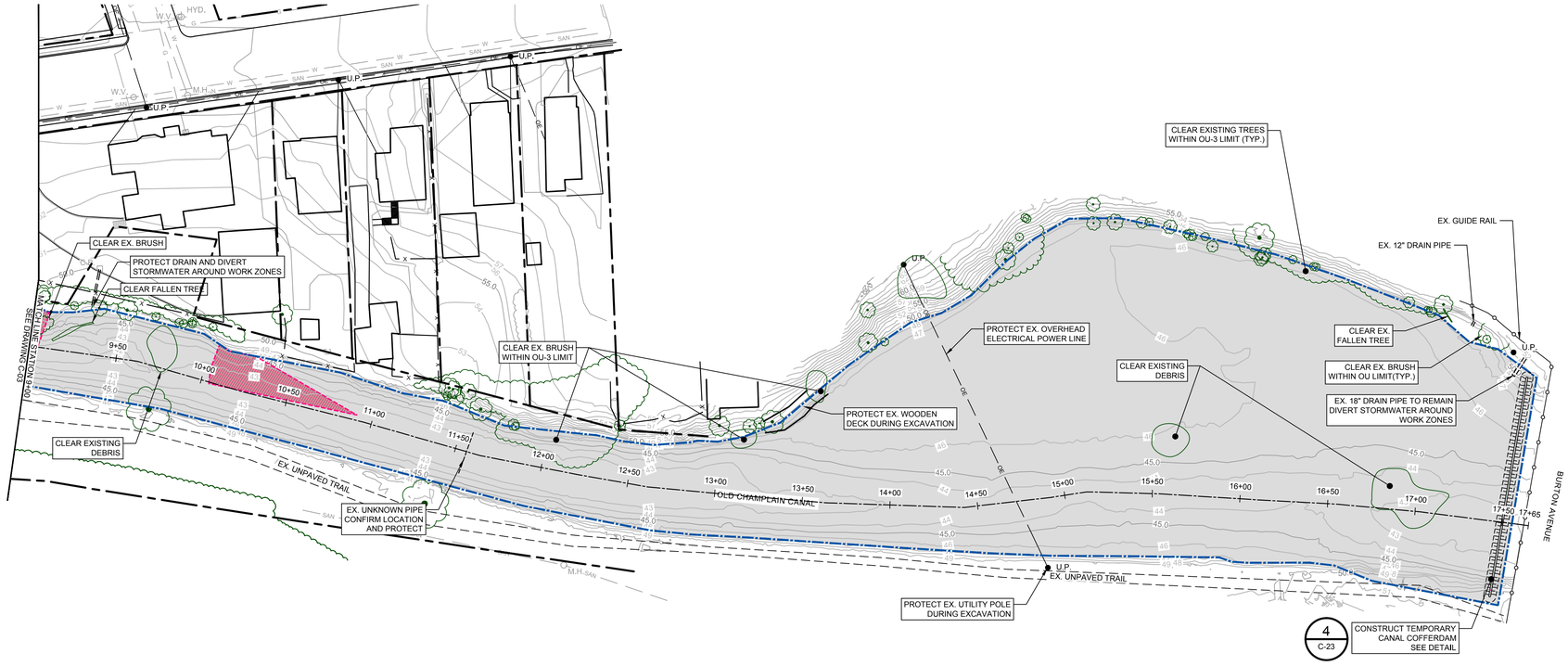
GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: C-02

80987-20(007)CI-WA023 MAR 21/2016





Nº	Revision	Date	Initial

0 20 40ft

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs < 50 ppm
- PROPOSED TREE REMOVAL AREA

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

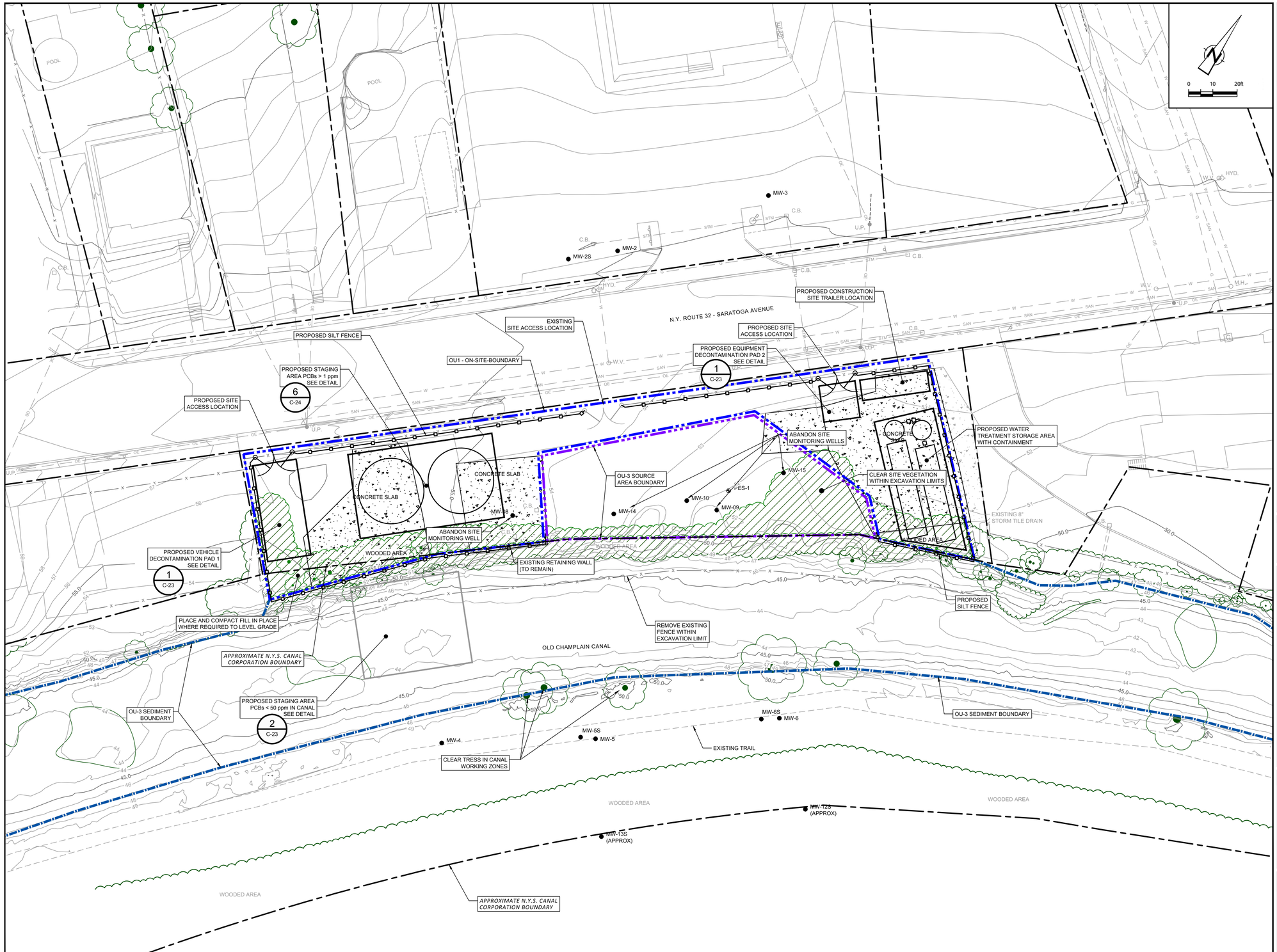
SITE WORKS
PHASE 1 - OU3 SEDIMENTS/ SOURCE SOILS

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 40'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-03

80987-20(007)CI-WA026 MAR 21/2016



No	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- x x EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- PROPOSED TREE REMOVAL AREA
- PROPOSED SILT FENCE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial
ISSUED TO NYSDEC	MAR. 22, 2016	R.M.

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

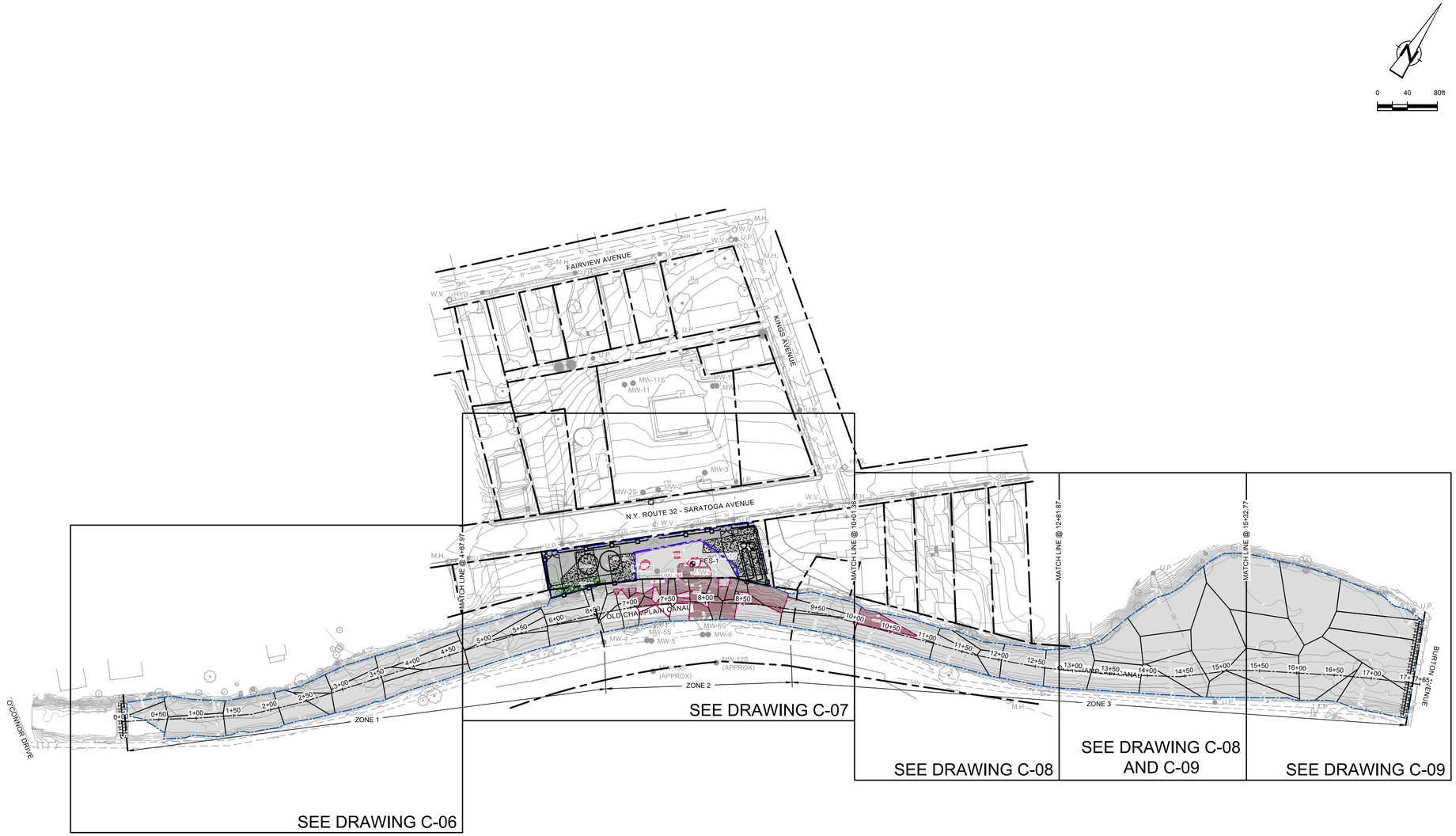
SITE PREPARATION PLAN
PHASE I - OU3 SEDIMENT/SOURCE SOILS

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: C-04

80987-20(007)CI-WA024 MAR 21/2016



NΩ	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- APPROXIMATE EXTENT OF > 50ppm PCB TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs < 50 ppm
- PROPOSED SILT FENCE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

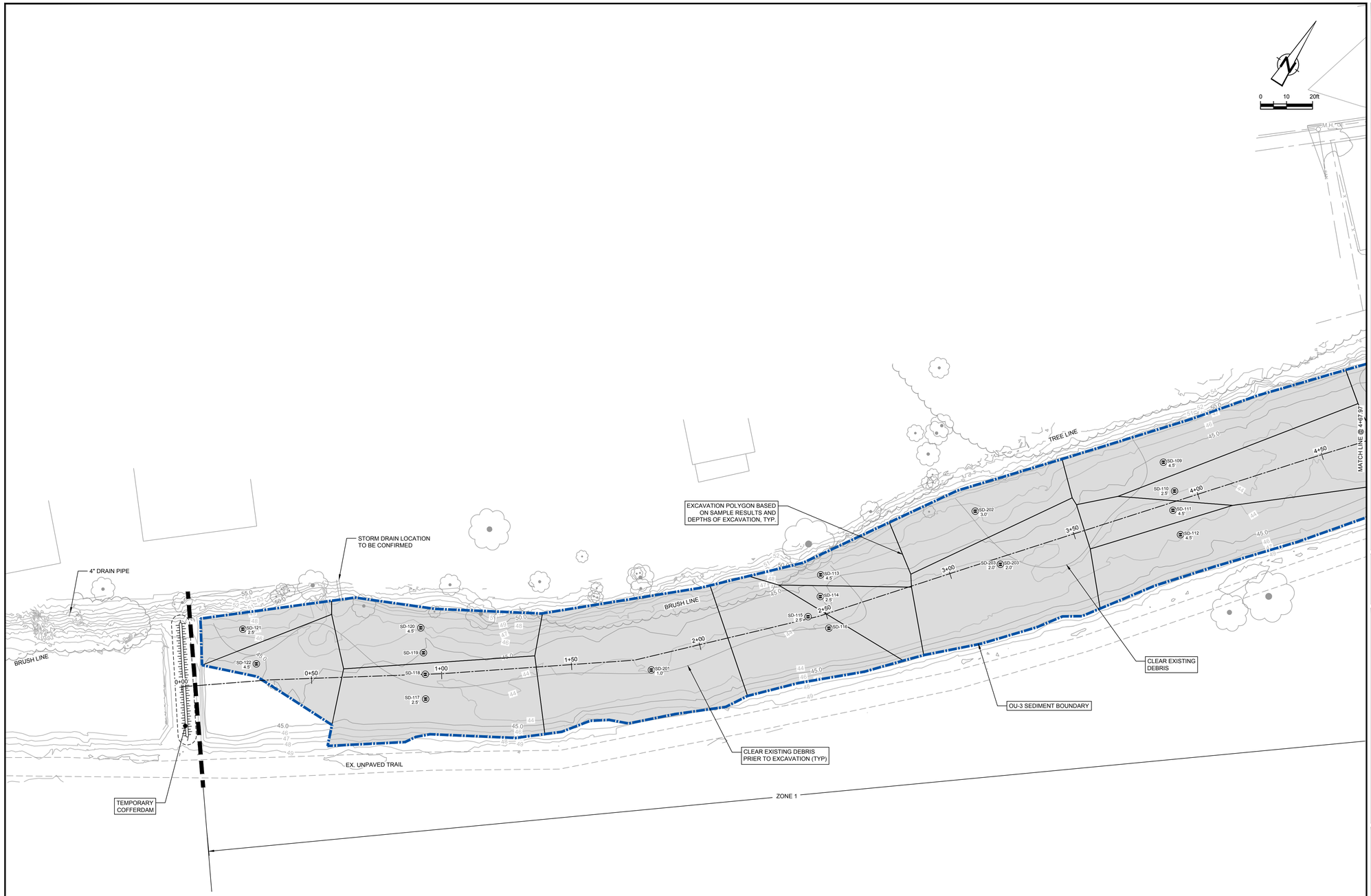
CANAL SEDIMENT EXCAVATION OVERALL PLAN LAYOUT

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 80'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-05

80987-20(007)CI-WA025 MAR 21/2016



NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs < 50 ppm
- EXCAVATION POLYGON
- SD-78 2.5' 5.0' SEDIMENT SAMPLE ID; 1# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<50ppm PCBs); 2# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<1ppm PCBs)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

REMEDIAL DESIGN REPORT

CANAL SEDIMENT EXCAVATION PLAN 1 OF 4

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project NO.: 80987-20	Report NO.: 007	Drawing NO.: C-06

80987-20(007)CI-WA025 MAR 21/2016

NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 — EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN — EXISTING SANITARY SEWER
- STM — EXISTING STORM SEWER
- W — EXISTING WATER MAIN
- OE — EXISTING ELECTRICAL OVERHEAD LINE
- G — EXISTING GAS MAIN
- X — EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. — EXISTING CATCH BASIN
- M.H. — EXISTING MAN HOLE
- HYD. — EXISTING HYDRANT
- U.P. — EXISTING UTILITY POLE
- W.V. — EXISTING WATER VALVE
- MW-5 — EXISTING MONITORING WELL
- BM — EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- APPROXIMATE EXTENT OF > 50ppm PCB TSCA EXCAVATION AREA
- SEDIMENT PCBs ≥ 500ppm
- APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs < 50 ppm
- EXCAVATION POLYGON
- PROPOSED SILT FENCE
- SD-78 — SEDIMENT SAMPLE ID
- 2.5' — 1# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<50ppm PCBs)
- 5.0' — 2# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<1ppm PCBs)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

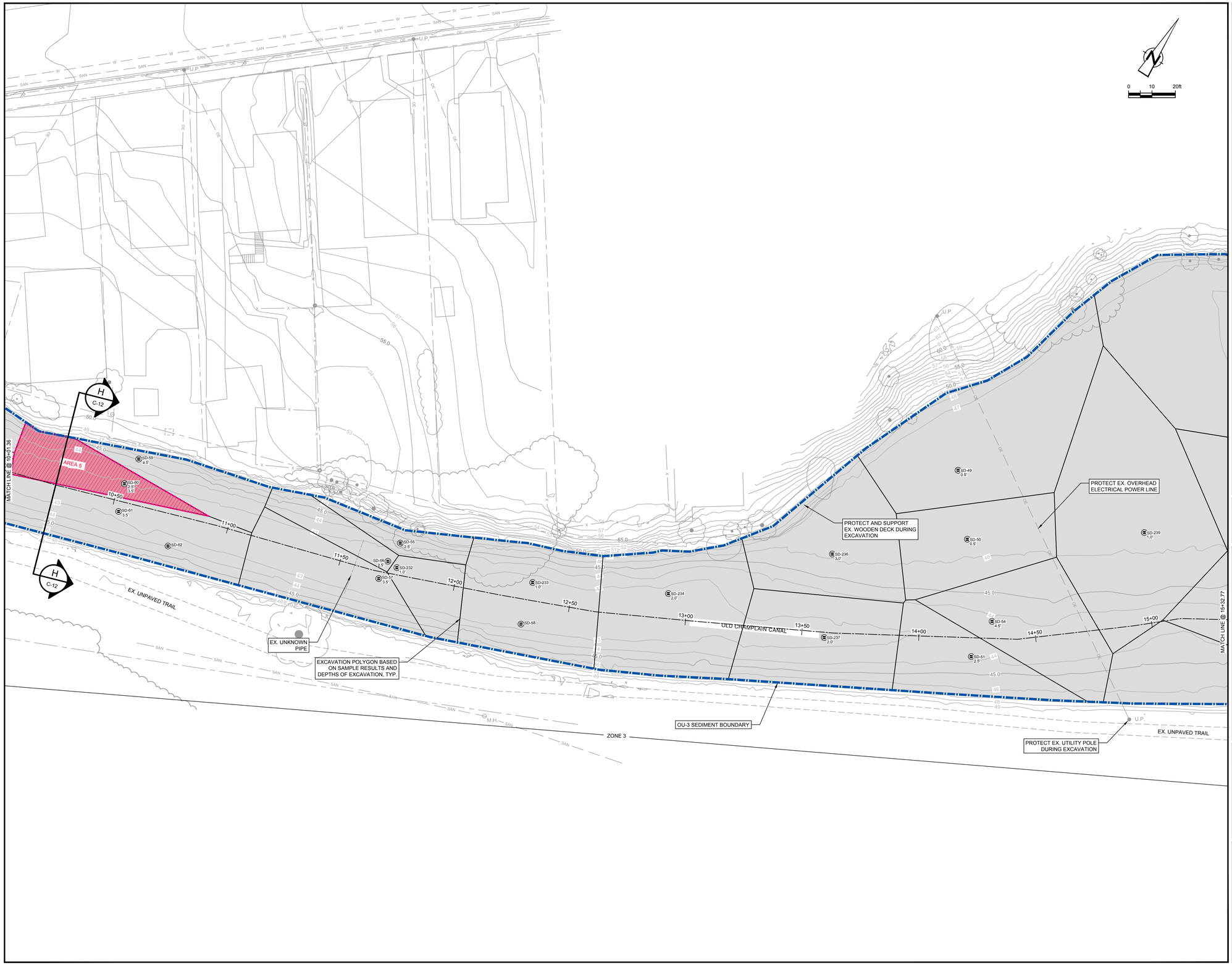
CANAL SEDIMENT EXCAVATION PLAN 2 OF 4

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: C-07

80987-20(007)CI-WA025 MAR 21/2016



NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
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- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
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- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- APPROXIMATE EXTENT OF > 50ppm PCB TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs < 50 ppm
- EXCAVATION POLYGON
- SD-78 SEDIMENT SAMPLE ID
  - 2.5' 1# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<50ppm PCBs)
  - 5.0' 2# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<1ppm PCBs)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

REMEDIAL DESIGN REPORT

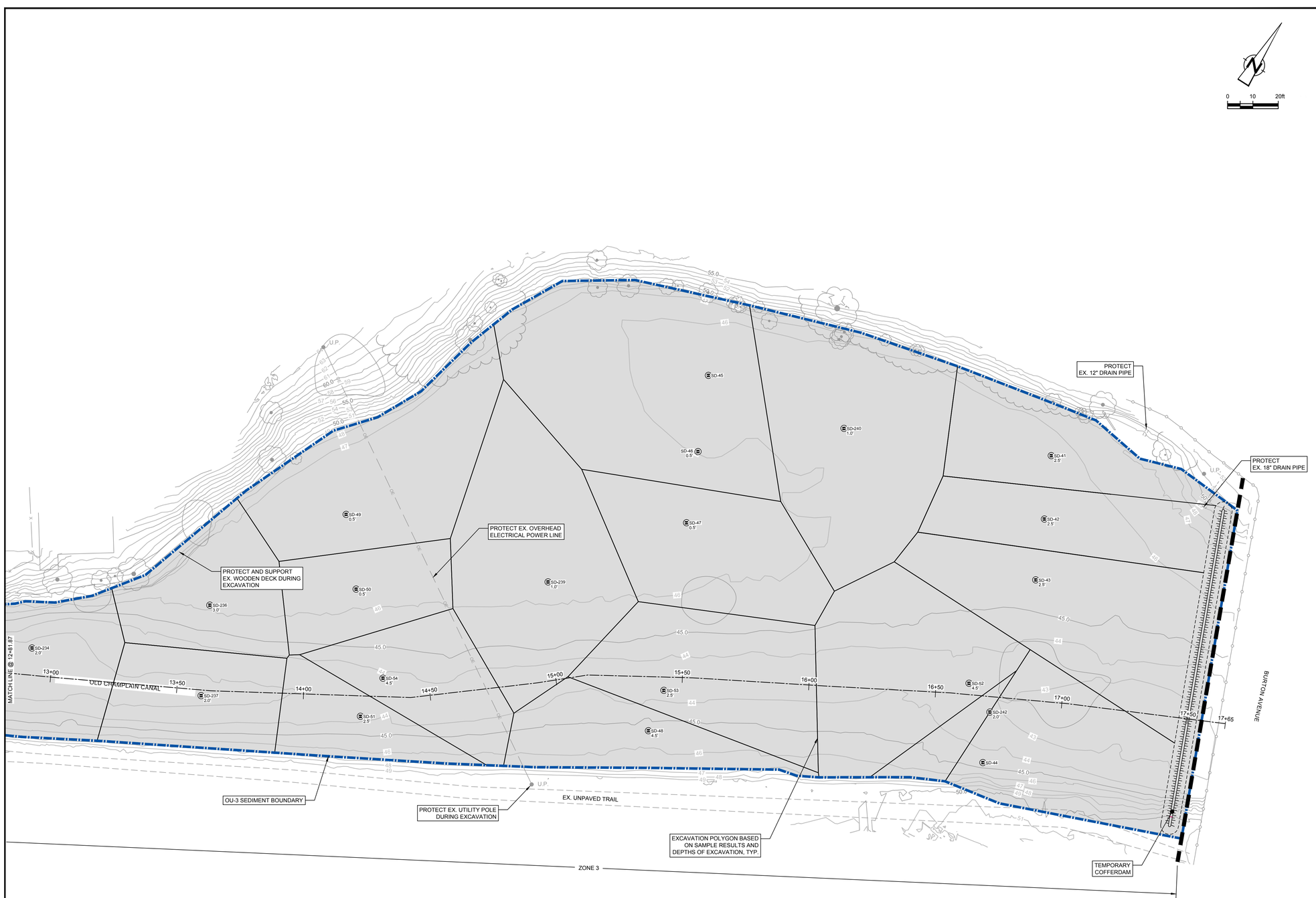
CANAL SEDIMENT EXCAVATION
PLAN 3 OF 4

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: C-08

80987-20(007)CI-WA025 MAR 21/2016



Nº	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
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- X EXISTING FENCE LINE (APPROXIMATE)
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- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- APPROXIMATE EXTENT OF > 50ppm PCB TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA
- APPROXIMATE EXTENT OF PCBs < 50 ppm
- EXCAVATION POLYGON
- SD-78 SEDIMENT SAMPLE ID
  - 2.5' 1# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<50ppm PCBs)
  - 5.0' 2# BELOW GROUND SURFACE DEPTH OF EXCAVATION (<1ppm PCBs)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

REMEDIAL DESIGN REPORT

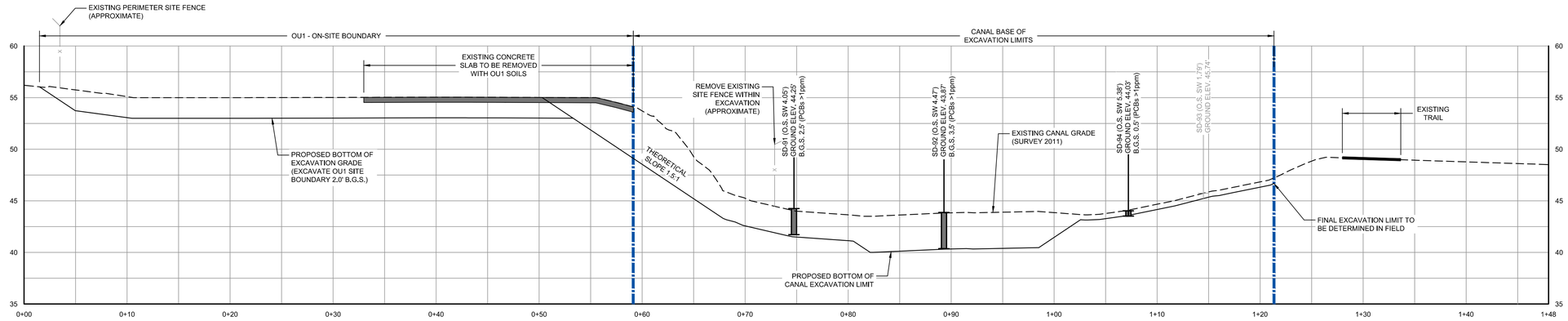
CANAL SEDIMENT EXCAVATION
PLAN 4 OF 4

GHD

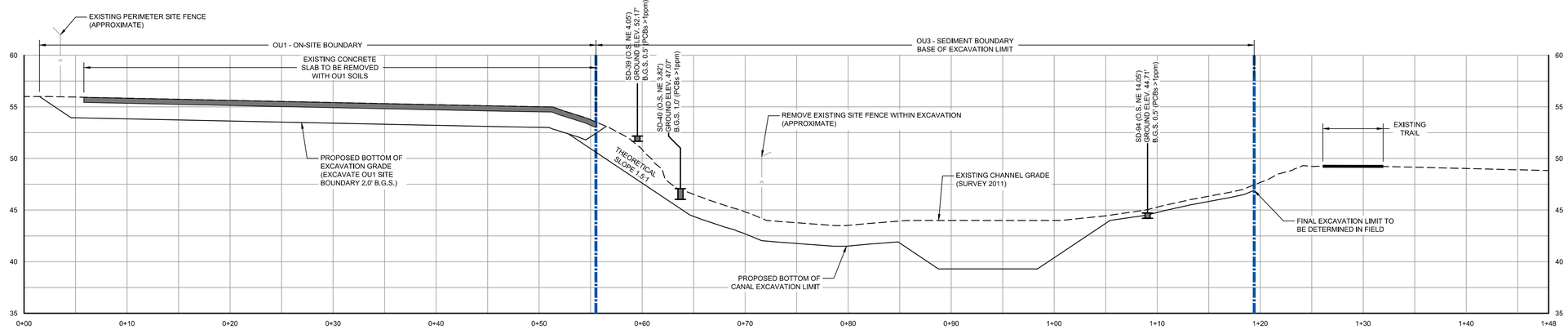
Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-09

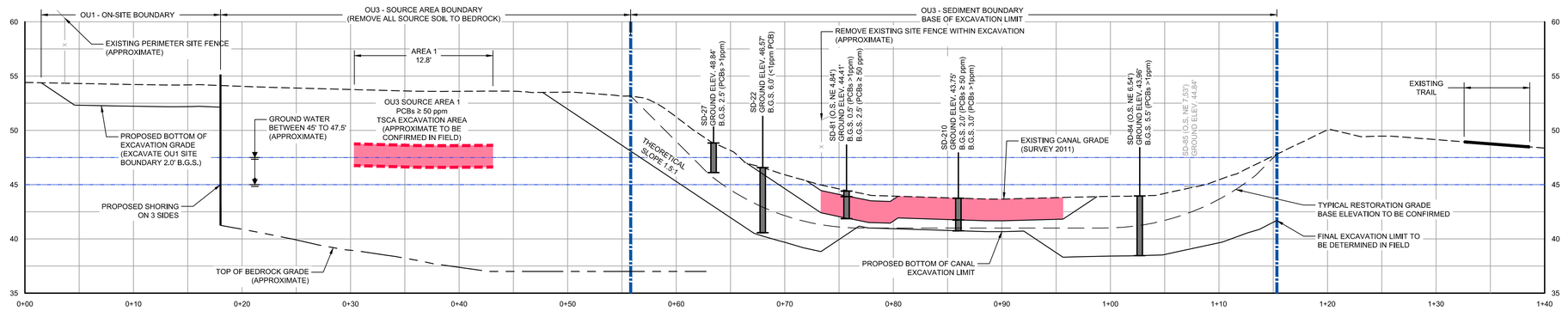
80987-20(007)CI-WA025 MAR 21/2016



SECTION A-A' STA. 6+24.96
1" = 6'
C-07



SECTION B-B' STA. 6+62.81
1" = 6'
C-07



SECTION C-C' STA. 7+21.86
1" = 6'
C-07

NO	Revision	Date	Initial

LEGEND

APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

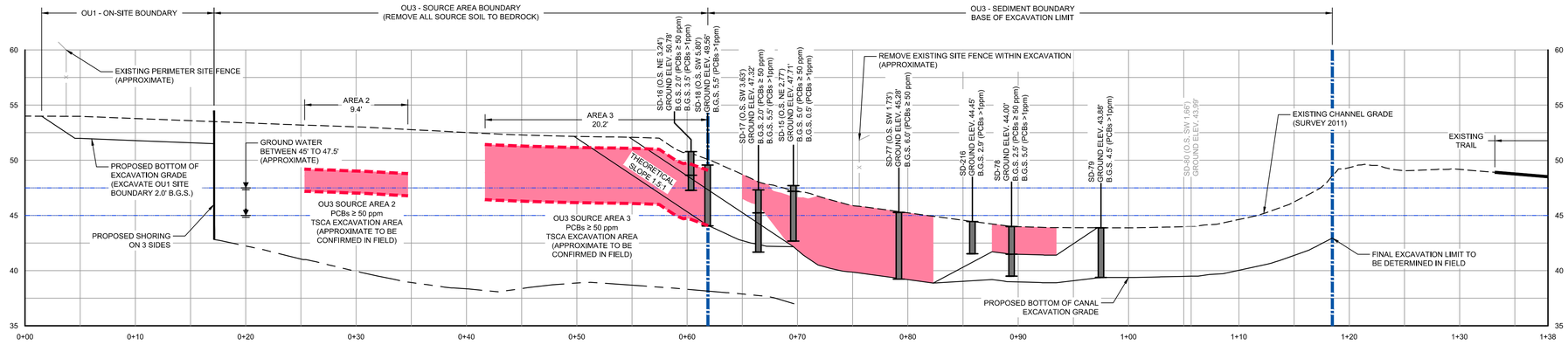
CANAL SEDIMENT EXCAVATION
CROSS SECTIONS PAGE 1 OF 3

GHD

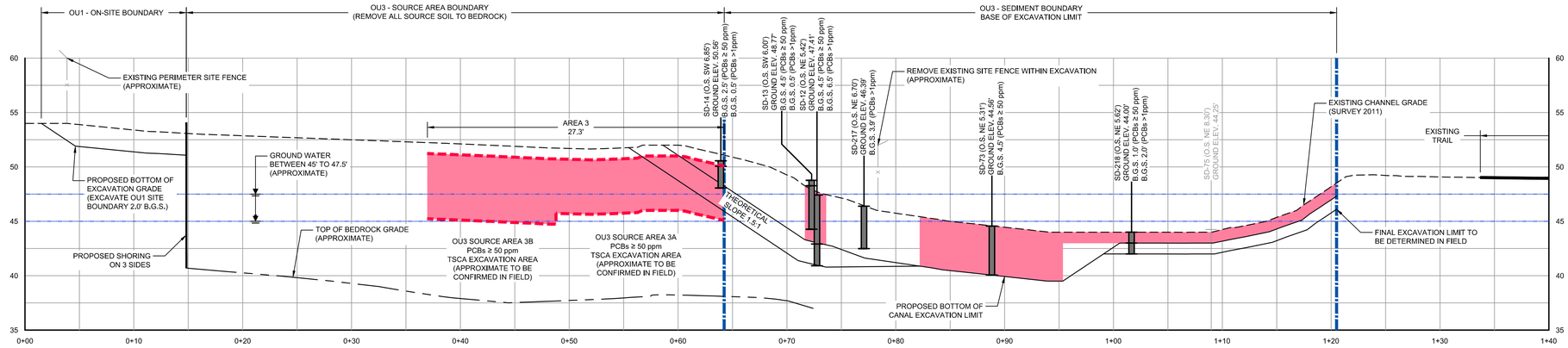
Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: AS SHOWN	Project No: 80987-20	Report No: 007	Drawing No: C-10

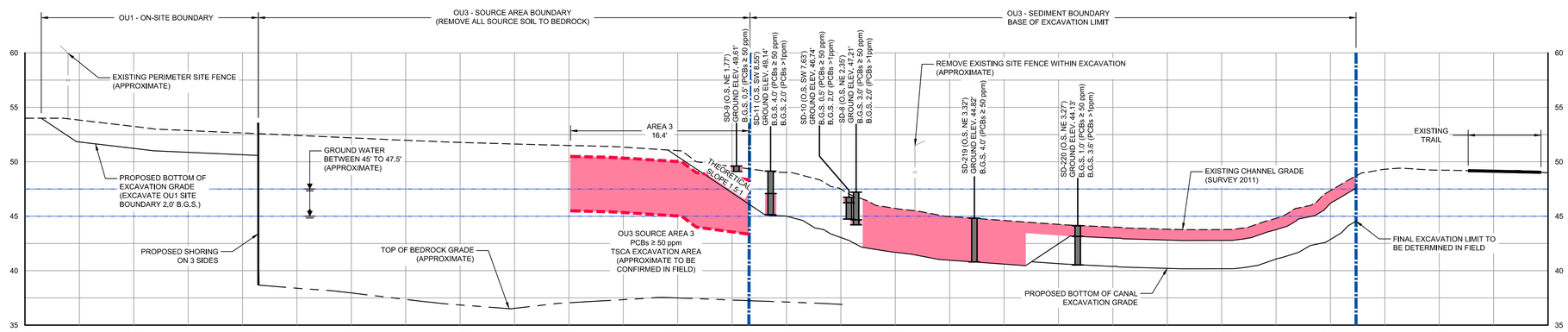
80987-20(007)CI-WA025 MAR 21/2016



SECTION D-D' STA. 7+67.30
1" = 6'
C-07



SECTION E-E' STA. 7+85.54
1" = 6'
C-07



SECTION F-F' STA. 8+09.89
1" = 6'
C-07

NO	Revision	Date	Initial

LEGEND

APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

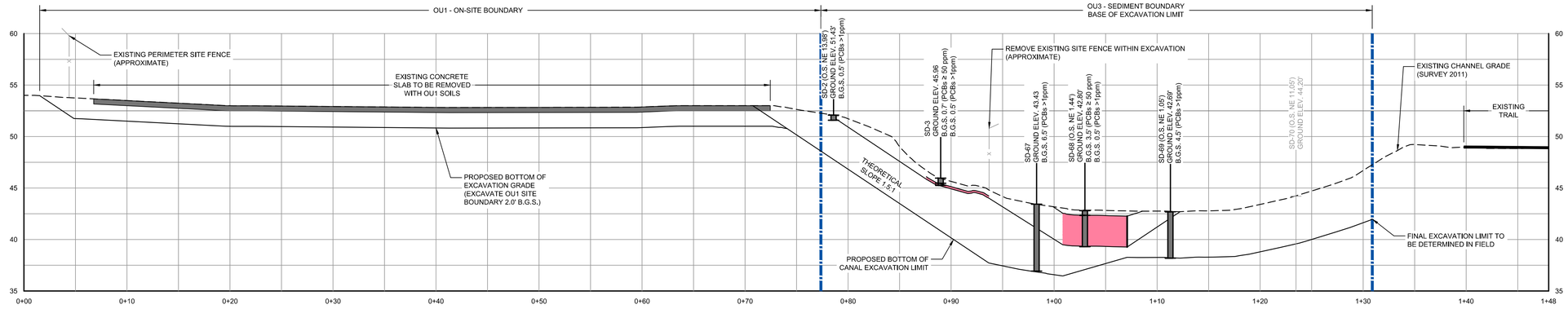
CANAL SEDIMENT EXCAVATION
CROSS SECTIONS PAGE 2 OF 3

GHD

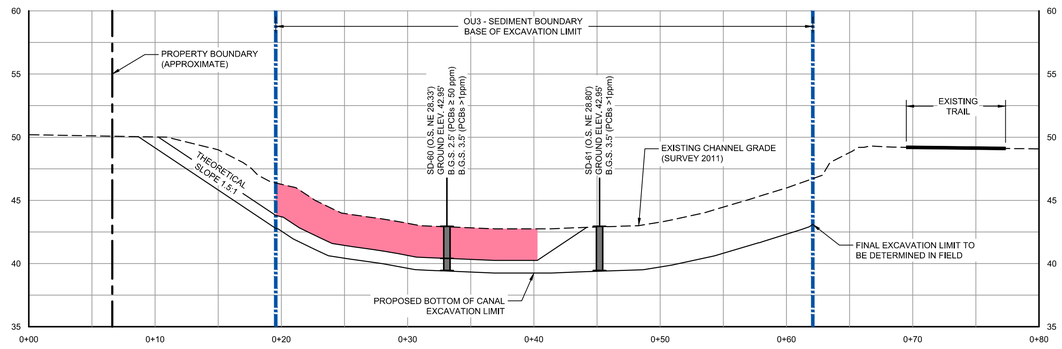
Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: AS SHOWN	Project NO: 80987-20	Report NO: 007	Drawing NO: C-11

80987-20(007)CI-WA025 MAR 21/2016



SECTION G-G' STA. 8+49.27
1" = 6'
C-07



SECTION H-H' STA. 10+24.17
1" = 6'
C-08

NO	Revision	Date	Initial

LEGEND

APPROXIMATE EXTENT OF PCBs ≥ 50 ppm TSCA EXCAVATION AREA

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

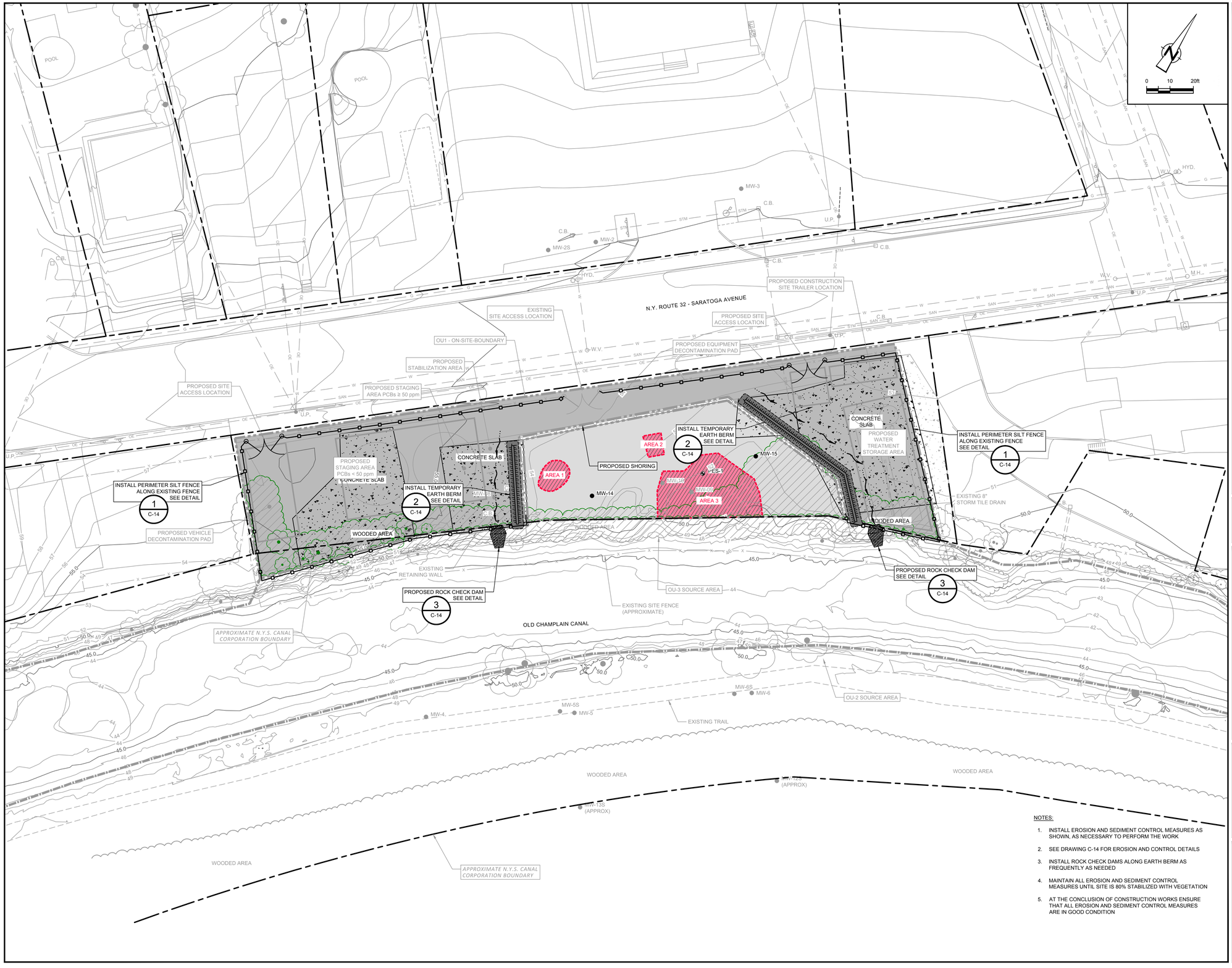
CANAL SEDIMENT EXCAVATION
CROSS SECTIONS PAGE 3 OF 3

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: AS SHOWN	Project No: 80987-20	Report No: 007	Drawing No: C-12

80987-20(007)CI-WA025 MAR 21/2016



NOTES:

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN, AS NECESSARY TO PERFORM THE WORK
2. SEE DRAWING C-14 FOR EROSION AND CONTROL DETAILS
3. INSTALL ROCK CHECK DAMS ALONG EARTH BERM AS FREQUENTLY AS NEEDED
4. MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL SITE IS 80% STABILIZED WITH VEGETATION
5. AT THE CONCLUSION OF CONSTRUCTION WORKS ENSURE THAT ALL EROSION AND SEDIMENT CONTROL MEASURES ARE IN GOOD CONDITION

No	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SEDIMENT BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- APPROXIMATE EXTENT OF > 50ppm PCB TSCA EXCAVATION AREA
- PROPOSED SILT FENCE
- PROPOSED SHORING
- PROPOSED BERM TOP OF BANK
- PROPOSED BERM TOE OF SLOPE
- PROPOSED ROCK CHECK DAM
- PROPOSED WATER FLOW DIRECTION

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

PHASE II - EROSION AND SEDIMENT CONTROL SITE PLAN

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: C-13

80987-20(007)CI-WA027 MAR 21/2016

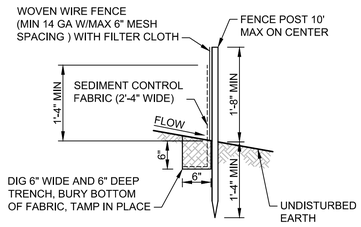


FIGURE 1

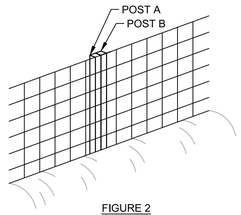


FIGURE 2

FIGURE 3

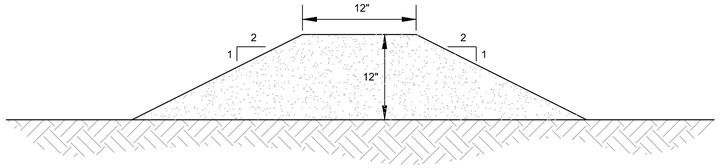
NOTES:

1. SILT FENCE HEIGHT TO BE 1'-8" MIN ABOVE GROUND, CONSTRUCTED OF FABRIC WITH MIN TENSILE STRENGTH OF 136LBS.
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL "T" OR "U" TYPE OR HARDWOOD.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE. SILT FENCE TO HAVE FACTORY ATTACHED FENCE POSTS.
4. REFER TO DRAWING FOR LOCATION OF SILT FENCE.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

INSTALLATION SEQUENCE:

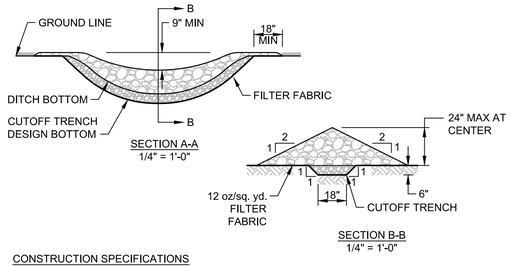
1. DIG A 6" X 6" TRENCH ALONG SILT FENCE LOCATIONS SHOWN.
2. UNROLL SILT FENCE POSITIONING THE POSTS ON THE DOWNSTREAM SIDE.
3. DRIVE POSTS INTO THE GROUND AS SHOWN ON FIGURE 1.
4. LAY THE BOTTOM 12" OF FABRIC FLAP IN THE BOTTOM OF THE TRENCH, BACKFILL AND COMPACT.
5. ADJACENT SECTIONS OF THE SILT FENCE ARE JOINED AS SHOWN IN FIGURE 3. A COUPLER CAN BE USED TO SECURE ADJACENT POSTS AS SHOWN IN FIGURE 2.

DETAIL 1 SILT FENCE (TYP)
NTS C-13



NOTES:
1. ALL BERMS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
2. ALL BERMS SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. TOP WIDTH MAY BE WIDER AND SIDE SLOPES BE FLATTER IF DESIRED TO FACILITATE CROSSING BE CONSTRUCTION TRAFFIC.
4. STABILIZATION SHALL BE DONE BY USING SEED AND STRAW MULCH.

DETAIL 2 EARTH BERM (TYP)
NTS C-13



CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 18" BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

DETAIL 3 CHECK DAM (TYP)
NTS C-13

No	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

EROSION AND SEDIMENT CONTROL MEASURES DETAILS

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	A. WALTHO	JANUARY 2015	
Scale: AS SHOWN	Project No: 80987-20	Report No: 007	Drawing No: C-14

NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 — EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN — EXISTING SANITARY SEWER
- STM — EXISTING STORM SEWER
- W — EXISTING WATER MAIN
- OE — EXISTING ELECTRICAL OVERHEAD LINE
- G — EXISTING GAS MAIN
- X — X — EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. — EXISTING CATCH BASIN
- M.H. — EXISTING MAN HOLE
- HYD. — EXISTING HYDRANT
- U.P. — EXISTING UTILITY POLE
- W.V. — EXISTING WATER VALVE
- MW-5 — EXISTING MONITORING WELL
- OU1 - ON-SITE BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- OU-1 SOIL EXCAVATION AREA AREA = 12090 ft²
- SB-72 — SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 72a — SOIL BORING LOCATION (CRA, 2014)

NOTES

- BOGS - BELOW ORIGINAL GROUND SURFACE
- TSCA - TOXIC SUBSTANCE CONTROL ACT
- LDR - LAND DISPOSAL RESTRICTIONS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

SOURCE AREA OU-1
IMPACTED SOIL EXCAVATION (0-2 ft. BGS)

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-15

80987-20(007)CI-WA020 MAR 21/2016

NOTES

- BOGS - BELOW ORIGINAL GROUND SURFACE
- TSCA - TOXIC SUBSTANCE CONTROL ACT
- LDR - LAND DISPOSAL RESTRICTIONS

NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- PCB < TSCA AND VOC < LDR AREA = 6277 ft
- SB-72 SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 72a SOIL BORING LOCATION (CRA, 2014)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

SOURCE AREA OU-3
IMPACTED SOIL EXCAVATION (0-1 ft. BGS)

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: C-16

80987-20(007)CI-WA014 MAR 21/2016

EXCAVATION AREA #	SOIL REMOVAL INTERVAL (ft. BGS)	THICKNESS (ft.)	VOLUME (yd^3)	DISPOSAL TYPE	VERIFICATION SAMPLE DEPTH (ft. BGS)
3	1-2	1	36	TSCA	- -

NOTES

- BOGS - BELOW ORIGINAL GROUND SURFACE
- TSCA - TOXIC SUBSTANCE CONTROL ACT
- LDR - LAND DISPOSAL RESTRICTIONS

NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- PCB < TSCA AND VOC < LDR AREA 3 = 5312 ft²
- PCB > TSCA AND VOC < LDR AREA 3 = 965 ft²
- APPROXIMATE EXTENT OF PCBs ≥ 500 ppm TSCA EXCAVATION AREA
- SB-72 SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 72a SOIL BORING LOCATION (CRA, 2014)
- 1 VERIFICATION GRAB SAMPLE LOCATION
- 5' x 5' SAMPLE GRID

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

SOURCE AREA OU-3
IMPACTED SOIL EXCAVATION (1-2 ft. BGS)

GHD

Source Reference:			
Project Manager: J. PUSKAS	Reviewed By: R. MEDSGER	Date: SEPTEMBER 2015	
Scale: 1" = 20'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-17

80987-20(007)CI-WA015 MAR 21/2016

EXCAVATION AREA #	SOIL REMOVAL INTERVAL (ft. BGS)	THICKNESS (ft.)	VOLUME (yd^3)	DISPOSAL TYPE	VERIFICATION SAMPLE DEPTH (ft. BGS)
3	2-4	2	72	TSCA	- -

NOTES

- BOGS - BELOW ORIGINAL GROUND SURFACE
- TSCA - TOXIC SUBSTANCE CONTROL ACT
- LDR - LAND DISPOSAL RESTRICTIONS

NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- PCB < TSCA AND VOC < LDR AREA 3 = 5312 ft²
- PCB ≥ TSCA AND VOC < LDR AREA 3 = 965 ft²
- SB-72 SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 72a SOIL BORING LOCATION (CRA, 2014)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

SOURCE AREA OU-3
IMPACTED SOIL EXCAVATION (2-4 ft. BGS)

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-18

80987-20(007)CI-WA016 MAR 21/2016

EXCAVATION AREA #	SOIL REMOVAL INTERVAL (ft. BGS)	THICKNESS (ft.)	VOLUME (yd^3)	DISPOSAL TYPE	VERIFICATION SAMPLE DEPTH (ft. BGS)
1	4-6	2	10	TSCA	6
2	4-6	2	5	TSCA	6
3A	4-6	2	59	TSCA	6
3B	4-6	2	13	TSCA	-

NOTES

- BOGS - BELOW ORIGINAL GROUND SURFACE
- TSCA - TOXIC SUBSTANCE CONTROL ACT
- LDR - LAND DISPOSAL RESTRICTIONS
- GRAB SAMPLES COLLECTED FROM GRID NODES WITH LIKE NUMBERS WILL BE COMBINED TO FORM ONE COMPOSITE SAMPLE
- GRID INTERVAL IS 5 FEET
- COMPOSITE SAMPLES SHOULD BE COMBINED FROM A MAXIMUM OF 9 GRAB SAMPLES WITH A MINIMUM OF 3 SAMPLES COLLECTED FROM EACH AREA

Nº	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- PCB < TSCA AND VOC < LDR AREA 3 = 5112 ft²
- PCB ≥ TSCA AND VOC < LDR AREA 2 = 69 ft², AREA 3A = 794 ft², AREA 3B = 171 ft²
- PCB ≥ TSCA AND VOC > LDR AREA 1 = 131 ft²
- SB-72 SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 72a SOIL BORING LOCATION (CRA, 2014)
- 1 VERIFICATION GRAB SAMPLE LOCATION
- 5' x 5' SAMPLE GRID

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

SOURCE AREA OU-3
IMPACTED SOIL EXCAVATION (4-6 ft. BGS)

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-19

80987-20(007)CI-WA017 MAR 21/2016

EXCAVATION AREA #	SOIL REMOVAL INTERVAL (ft. BGS)	THICKNESS (ft.)	VOLUME (yd^3)	DISPOSAL TYPE	VERIFICATION SAMPLE DEPTH (ft. BGS)
3B	6-8	2	13	TSCA	8

Nº	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- PCB < TSCA AND VOC < LDR AREA 3 = 5112 ft²
- APPROXIMATE EXTENT OF PCBs ≥ 500 ppm TSCA EXCAVATION AREA - AREA 3B = 171 ft²
- POTENTIAL PCB > TSCA BASED ON VERIFICATION SAMPLING AREA 1 = 131 ft², AREA 2 = 69 ft², AREA 3A = 794 ft²
- SB-72 SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 72a SOIL BORING LOCATION (CRA, 2014)
- 1 VERIFICATION GRAB SAMPLE LOCATION
- 5' x 5' SAMPLE GRID

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

NOTES

- BOGS - BELOW ORIGINAL GROUND SURFACE
- TSCA - TOXIC SUBSTANCE CONTROL ACT
- LDR - LAND DISPOSAL RESTRICTIONS
- GRAB SAMPLES COLLECTED FROM GRID NODES WITH LIKE NUMBERS WILL BE COMBINED TO FORM ONE COMPOSITE SAMPLE
- GRID INTERVAL IS 5 FEET
- COMPOSITE SAMPLES SHOULD BE COMBINED FROM A MAXIMUM OF 9 GRAB SAMPLES WITH A MINIMUM OF 3 SAMPLES COLLECTED FROM EACH AREA

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

SOURCE AREA OU-3
IMPACTED SOIL EXCAVATION (6-8 ft. BGS)

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-20

80987-20(007)CI-WA018 MAR 21/2016

NΩ	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- OU1 - ON-SITE BOUNDARY
- OU3 - SOURCE AREA BOUNDARY
- PCB < TSCA AND VOC < LDR AREA 3 = 5112 ft²
- POTENTIAL PCB > TSCA BASED ON VERIFICATION SAMPLING AREA 1 = 131 ft², AREA 2 = 69 ft², AREA 3 = 965 ft²
- SB-72 SOIL BORING LOCATION (MALCOLM PIRNIE, 2009 TO 2011)
- SB 72a SOIL BORING LOCATION (CRA, 2014)

NOTES

- BOGS - BELOW ORIGINAL GROUND SURFACE
- TSCA - TOXIC SUBSTANCE CONTROL ACT
- LDR - LAND DISPOSAL RESTRICTIONS
- ADDITIONAL EXCAVATION MAY BE REQUIRED BASED ON VERIFICATION SAMPLE RESULTS FROM 8 ft. BOGS (AREAS 1, 2 AND 3)

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

SOURCE AREA OU-3
IMPACTED SOIL EXCAVATION (8 ft. BGS - BEDROCK)

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-21

80987-20(007)CI-WA019 MAR 21/2016

NO	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- 50.0 EXISTING CONDITION CONTOUR
- EXISTING VEGETATION
- SAN EXISTING SANITARY SEWER
- STM EXISTING STORM SEWER
- W EXISTING WATER MAIN
- OE EXISTING ELECTRICAL OVERHEAD LINE
- G EXISTING GAS MAIN
- X EXISTING FENCE LINE (APPROXIMATE)
- EXISTING TREE
- C.B. EXISTING CATCH BASIN
- M.H. EXISTING MAN HOLE
- HYD. EXISTING HYDRANT
- U.P. EXISTING UTILITY POLE
- W.V. EXISTING WATER VALVE
- MW-5 EXISTING MONITORING WELL
- BM EXISTING BENCHMARK
- 56 PROPOSED FINAL GRADE CONTOUR

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave. Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

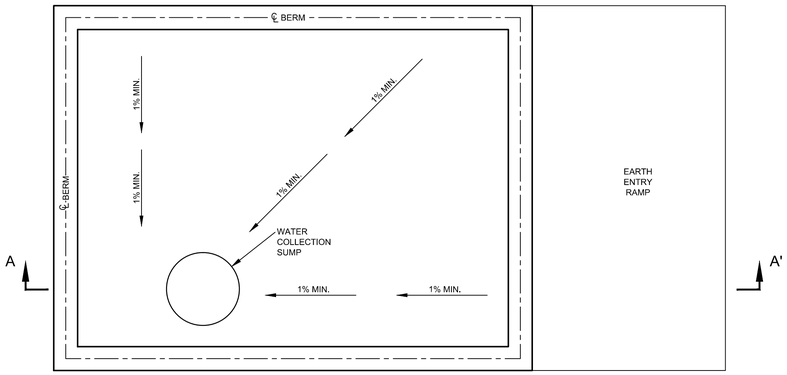
FINAL GRADING SITE PLAN

GHD

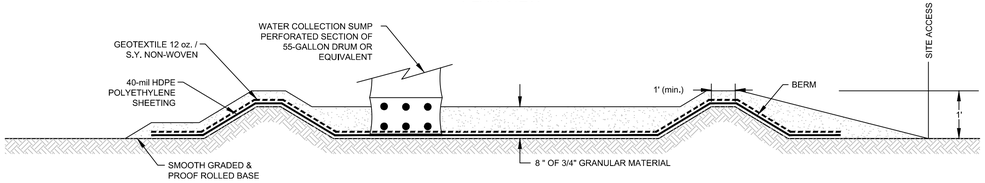
Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	R. MEDSGER	SEPTEMBER 2015	
Scale: 1" = 20'	Project No: 80987-20	Report No: 007	Drawing No: C-22

80987-20(007)CI-WA021 MAR 21/2016



PLAN VIEW



SECTION A-A'

NOTES:

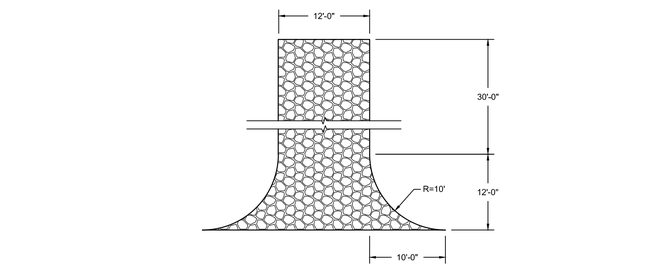
1. TEMPORARY DECONTAMINATION PAD TO BE CONSTRUCTED IN SUITABLE LOCATION CLOSE TO WORK AREAS, AS REQUIRED.
2. TEMPORARY DECONTAMINATION PAD GRANULAR MATERIAL AND SEDIMENTS COLLECTED FROM DECONTAMINATING EXCAVATION EQUIPMENT TO BE CHARACTERIZED FOR OFF-SITE DISPOSAL.

EQUIPMENT DECONTAMINATION PAD DIMENSIONS

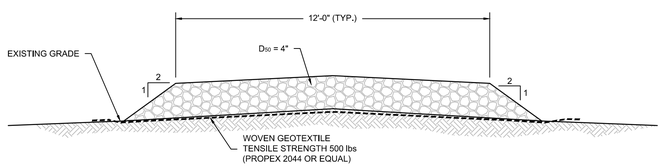
PAD I : 45 ft. x 18 ft.

PAD II : 15 ft. x 15 ft.

DETAIL 1 TYPICAL EQUIPMENT DECONTAMINATION PAD I, II DETAIL
NTS C-04

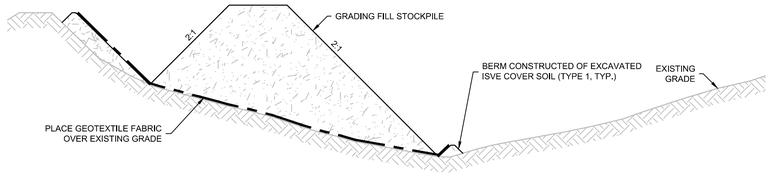


PLAN

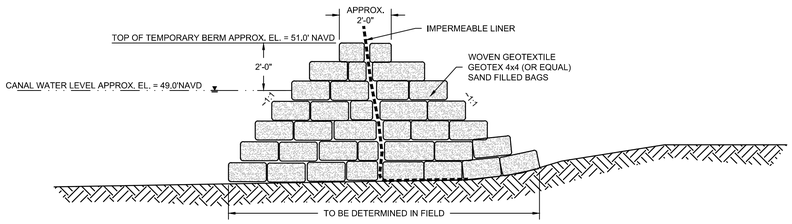


SECTION
N.T.S.

DETAIL 3 STABILIZED CONSTRUCTION ENTRANCE
NTS -



DETAIL 2 SOIL STOCKPILE AREA
HOR. 1" = 40'
VER. 1" = 20
C-04



DETAIL 4 TEMPORARY CANAL BERM
NTS C-03

DETAIL 5 TBD
NTS C-04

No	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave., Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

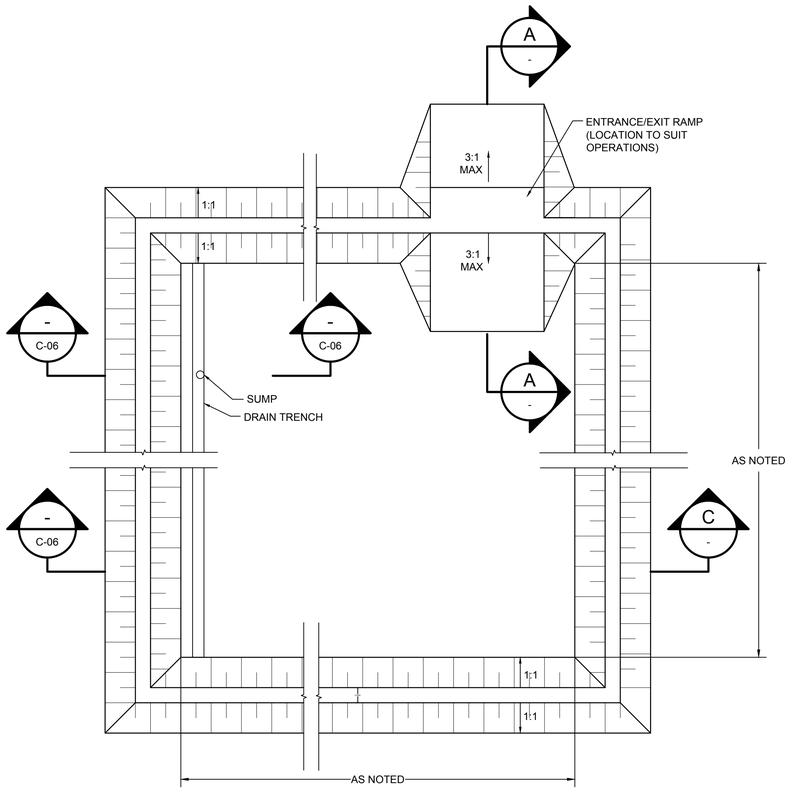
DETAILS I

GHD

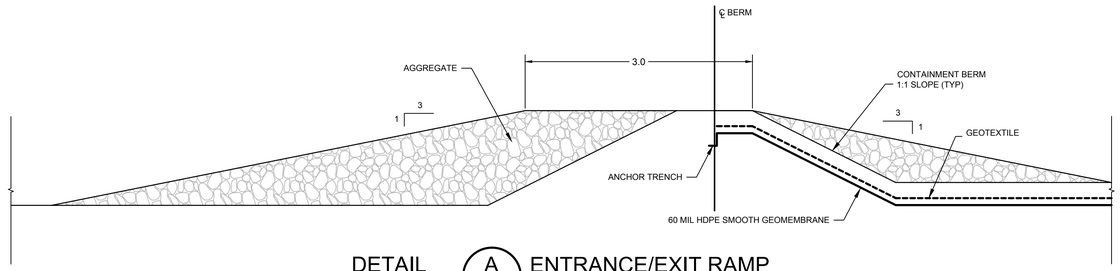
Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	A. WALTHO	JANUARY 2015	
Scale: AS SHOWN	Project No: 80987-20	Report No: 007	Drawing No: C-23

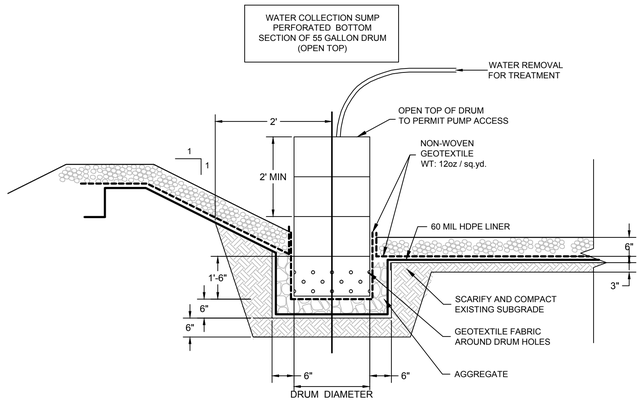
80987-20(007)CI-WA007 MAR 21/2016



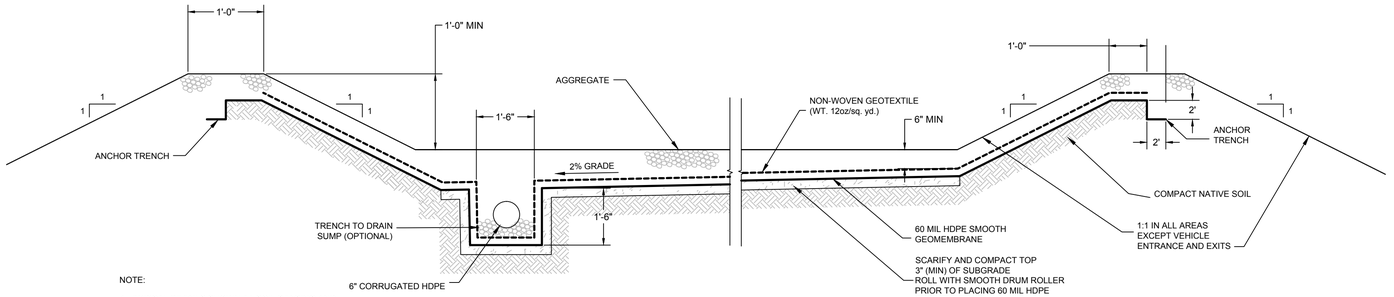
PLAN
N.T.S.



DETAIL A - ENTRANCE/EXIT RAMP
N.T.S.



SECTION B - SUMP PUMP
N.T.S.



NOTE:

A. TYPICAL DETAILS SHOWN AT SOIL STAGING AND DEWATERING AREA MAY BE REVISED BY THE CONTRACTOR. CONTRACTOR'S REVISED DETAILS SHALL BE SUBMITTED FOR REVIEW BY CRA PRIOR TO CONSTRUCTION.
B. DO NOT USE FOR SOILS WITH PCB'S ≥ 500ppm
PLACE IN ROLL OFF

SECTION C - SUMP PUMP
N.T.S.

DETAIL 6 (C-04) - SITE STAGING AREA PCBs > 1ppm
NTS

Nº	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave., Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

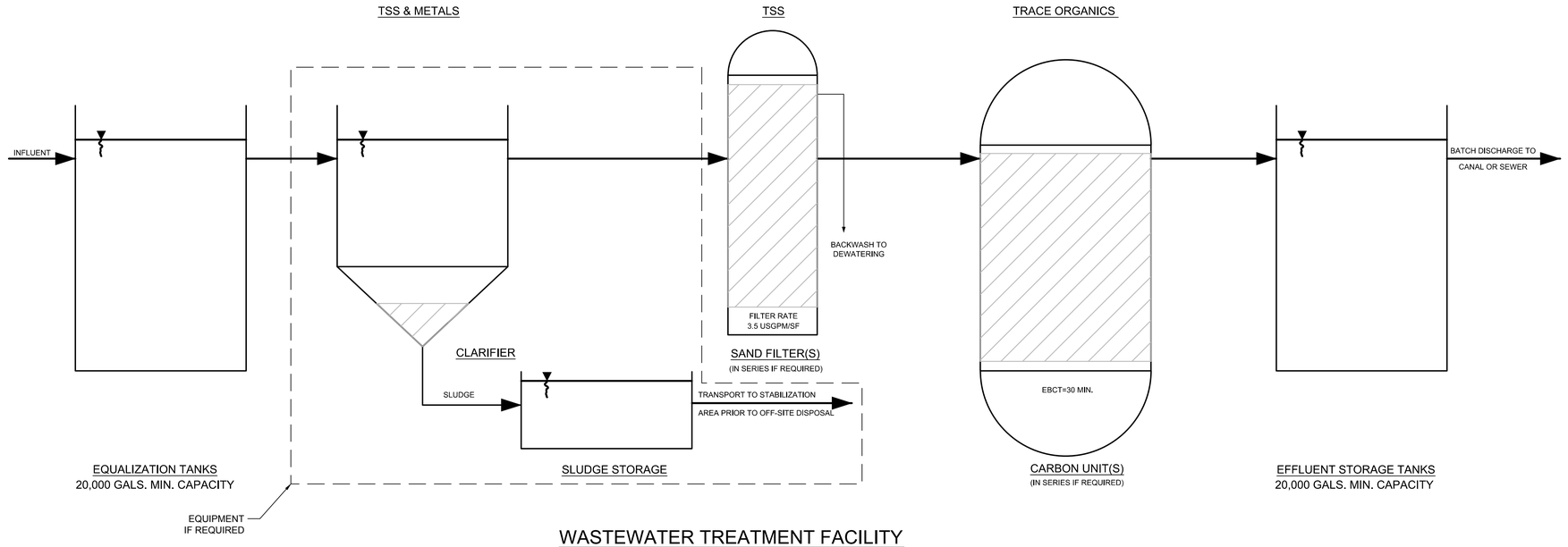
DETAILS II

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	A. WALTHO	JANUARY 2015	
Scale: AS SHOWN	Project Nº: 80987-20	Report Nº: 007	Drawing Nº: C-24

80987-20(007)CI-WA008 MAR 21/2016



WASTEWATER TREATMENT FACILITY
PROCESS FLOW DIAGRAM

NOTE:
FINAL TREATMENT REQUIREMENTS TO BE DETERMINED BASED ON DISCHARGE PERMIT.

No	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

ISSUED TO NYSDEC	MAR. 22, 2016	R.M.
Status	Date	Initial

FRIEDRICHSOHN COOPERAGE SITE
153-155 Saratoga Ave., Waterford, New York

PRELIMINARY REMEDIAL DESIGN REPORT

WASTE WATER
TREATMENT FACILITY

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. PUSKAS	A. WALTHO	SEPTEMBER 2015	
Scale: NTS	Project No.: 80987-20	Report No.: 007	Drawing No.: IC-01

80987-20(007)IC-WA001 MAR 21/2016

www.ghd.com