Remedial Investigation/ Alternatives Analysis Report

Southside Plaza Site
BCP Site No. C907043
Jamestown, New York

June 2020 B0505-019-001

Prepared For:

LB-UBS 2007 - C6 - Southside Station LLC
c/o Kazmarek Mowrey Cloud Laseter LLP

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REMEDIAL INVESTIGATION/ ALTERNATIVES ANALYSIS REPORT

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BCP SITE NO. C907043
JAMESTOWN, NEW YORK

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RI/AA REPORT
Southside Plaza Site
BCP Site No. C907043

TABLE OF CONTENTS

RI/AA REPORT
Southside Plaza Site
BCP Site No. C907043

TABLE OF CONTENTS

RI/AA REPORT
Southside Plaza Site
BCP Site No. C907043

TABLE OF CONTENTS

RI/AA REPORT
Southside Plaza Site
BCP Site No. C907043

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

RI/AA REPORT
Southside Plaza Site
BCP Site No. C907043

TABLE OF CONTENTS

APPENDICES

RI/AA REPORT
Southside Plaza Site
BCP Site No. C907043

CERTIFICATION

I, Lori E. Riker, certify that I am currently a NYS registered professional engineer as defined in 6NYCRR Part 375 and this Remedial Investigation/Alternatives Analysis (RI/AA) Report was prepared in general accordance with applicable statutes and regulations and in general conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10); and activities were performed in general accordance with the DER-approved work plan and any DER-approved modifications.

_____
Date

SEAL:

1.0 INTRODUCTION

This Remedial Investigation/Alternatives Analysis (RI/AA) Report has been prepared on behalf of LB-UBS 2007 - C6 - Southside Station LLC (Southside) for the Southside Plaza Site in the City of Jamestown, Chautauqua County, New York (Site, see Figures 1 and 2).

Southside elected to pursue cleanup and redevelopment of the Site under the New York State Brownfield Cleanup Program (BCP) and executed a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in March 2020 (BCP Site No. C907043), acting as a Participant. On April 10, 2020, the Remedial Investigation Work Plan (Ref. 1) was approved by the NYSDEC with concurrence from the New York State Department of Health (NYSDOH). Benchmark Environmental Engineering & Science, PLLC, in association with TurnKey Environmental Restoration, LLC (Benchmark- TurnKey), performed RI activities at the Site in April and May 2020.

1.1 Background

1.1.1 Site Description

The BCP property (Site) consists of one tax parcel designated as 704-744 Foote Avenue with SBL No. 404.07-8-3 totaling approximately 5 acres of land. The Site is located on Foote Avenue between Cole Avenue and Marion Street in a highly developed residential and commercial area in the City of Jamestown, Chautauqua County, New York. The Site is bordered by residential and commercial properties, and Cole Avenue to the north; residential and commercial properties, including the adjoining South Foote Avenue Plaza (SFAP) property to the south; residential properties and Ivy Street to the west; and residential and commercial properties and Foote Avenue to the east (see Figure 2). The Site is currently developed with two commercial buildings including a retail strip mall (58,741 square feet) and a separate restaurant tenant space (4,214 square feet), asphalt parking areas, an asphalt access road, and some green space.

1.1.2 Historic Property Use

The Site was improved with several residential properties from at least the 1890s to 1955. A strip mall (Building 1) and a former separate structure north of the strip mall (former

Building 2) were built between 1955-1958 and 1960. Building 1 shares a wall with the neighboring SFAP to the south. Although available records from the time of development are not definitive, it appears that the Southside Plaza and SFAP may have originally been developed together. In any event, Southside Plaza and SFAP have had separate ownership since at least 1962. Two historical dry cleaners were present from 1956 to at least 1975 in Building 1 tenant space historically addressed as 736 Foote Avenue (Triangle Cleaners and Anderson Cleaners). In addition, two historical dry cleaners occupied the Building 1 tenant space historically addressed at 750 Foote Avenue from approximately 1980 to at least 1994 (Anderson Cleaners and Whirley-Wash Dry Cleaners). The address number 750 is no longer in use so the precise location of that former tenant space is unclear but, based on the results of environmental sampling and other available information, it appears to have been at the south end of what is now the TOPS Market grocery store (TOPS).

The former Building 2 was historically occupied by two former gas stations from the mid-1950s to the late 1970s; Bish's South Side Service Station is known to have been located at the Site in 1969 and Cuifolo's Service Center is known to have been located at the Site in 1975. The former Building 2 was demolished between 1975 and 1980. The existing Building 2 was constructed in 1980 for use as a McDonald's. There is no evidence of underground storage tank (UST) usage at the former dry cleaner locations; however, two 500-gallon oil tanks and four 3,000-gallon gasoline tanks are known to be on-site per the City of Jamestown Fire Department. No information is available regarding petroleum bulk storage (PBS) registration or tank closure.

1.1.3 Previous Investigations

Previous environmental studies completed at the Site indicate that the Site is underlain by soil/fill impacted by chlorinated volatile organic compounds (cVOCs) yielding concentrations above 6NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (USCOs, Ref. 2) and Residential Use Soil Cleanup Objectives (RSCOs) and groundwater impacted by cVOCs yielding concentrations above Class GA Groundwater Quality Standards/Guidance Values (GWQS/GV) per NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Ref. 3). The highest concentrations of cVOCs in soil and groundwater were observed proximate to the former Whirley-Wash location; elevated

concentrations of cVOCs were also observed in sub-slab vapor samples collected from this area. A sub-slab depressurization system (SSDS) was installed in February 2013 at the location of the former Whirley-Wash, within the existing TOPS. Indoor air results collected in April 2013 from TOPS and the neighboring SFAP were below NYSDOH action levels, confirming that the SSDS is effectively mitigating cVOC concentrations in the sub-slab vapor of these buildings.

A summary of the investigations that have occurred at the Site are presented below. Appendix A includes the referenced reports. Figure 3 shows the locations of previous investigation locations and areas of concern.

1.1.3.1 April 2007 – Phase I Environmental Site Assessment

EMG Corporation (EMG) completed a Phase I Environmental Site Assessment (ESA) for Lehman Brothers Bank, FSB in April 2007. EMG identified the following recognized environmental condition (REC):

- The Site was historically occupied by a dry cleaner (Anderson Cleaners/Triangle Cleaners), which was formerly located in the southern portion of the Site, from 1956 until at least 1976.

1.1.3.2 November 2008 – Limited Site Investigation Report

Apex Companies, LLC (Apex) completed site investigation activities for Phillips Edison & Company Limited (PECO) in August 2008 and submitted a report summarizing the results in November 2008. The investigation consisted of sub-slab vapor sampling at two locations (SS-01 & SS-02) inside the existing TOPS and shallow soil gas sampling at two exterior locations (SV-01 & SV-02). Additionally, four soil borings were advanced to approximately 16 fbgs (SB-01 through SB-04). Three soil borings were converted into temporary groundwater wells (SB-01 through SB-03). Findings are detailed below:

- Mitigation recommended for tetrachloroethene (PCE) at SV-01. Monitoring recommended for PCE and 1,1,1-trichloroethane (1,1,1-TCA) at SS-01, PCE at SS-02, and trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE) at SV-01.
- Only PCE (62 ug/L) was detected above its GWQS at SB-01; total lead was detected above its GWQS at all three temporary well locations; dissolved lead was less than the method detection limit (MDL).

- No VOCs or semi-volatile organic compounds (SVOCs) were detected in the soil above MDLs.
- A discolored layer of soil at 1-2 fbgs was observed at SB-02. Lead was detected in the soil at SB-02 above 6NYCRR Part 375 USCOs with a concentration of 125 mg/kg. Total lead was also detected in the groundwater from a temporary well point installed in soil boring SB-02 at a concentration (0.093 mg/L), which is above the GWQS (0.025 mg/L). Analysis for dissolved lead was conducted on the temporary well point samples filtered in the laboratory; none of the three samples contained dissolved lead concentrations above the method detection limit indicating the lead is associated with the suspended solids.

1.1.3.3 March-May 2010 – Additional Site Investigation

Apex completed additional site investigation activities in March 2010 and submitted a report summarizing the results to PECO in May 2010. The investigation consisted of one interior sub-slab vapor investigation within the existing UPS store (SS-UPS) paired with one indoor air sample. Five soil borings were advanced and converted into temporary monitoring wells (SB-4/GW-4 through SB-9/GW-9). Findings are detailed below:

- No monitoring or mitigation recommended within the UPS store.
- Groundwater above GWQS/GV for PCE in all temporary wells except GW-7.
- Soil detected below MDLs except methylene chloride (MC), which was detected at all borings below USCOs. PCE detected at SB-8 below USCOs.

As a result of the groundwater contamination indicated in the November 2008 and May 2010 investigation reports submitted to PECO, Apex recommended the installation of five permanent monitoring wells to characterize groundwater contamination across the Site.

1.1.3.4 May-July 2010 – June 2010 Site Investigation

Apex completed site investigation activities between May and June 2010 and submitted a report summarizing the results to PECO in July 2010. The investigation consisted of five soil borings/permanent monitoring wells (MW-1 through MW-5). Findings are detailed below:

- Groundwater flows northeast across the Site.
- Groundwater was detected above GWQS/GV for PCE at all wells except MW-4 and for TCE at all wells except MW-3 and MW-4. MC and vinyl chloride (VC) were also detected above GWQS/GV at MW-1. Maximum concentrations were observed in MW-2 (PCE at 2,300 ug/L and TCE at 39 ug/L). MW-2 is screened at 5.5-16 fbgs and

water was observed at 6 fbgs. MW-2 is located downgradient of the former Anderson Cleaners.

- Soil detected below MDLs except MC, which was detected at all borings below USCOs and PCE and TCE at MW-3 (8-10 fbgs); PCE was detected below USCOs at 37 parts per billion (ppb) and TCE was detected below USCOs at 4 ppb. No elevated photoionization detector (PID) or visual/olfactory evidence of contamination observed.

1.1.3.5 February-May 2011 – April 2011 Site Investigation

Apex completed site investigation activities between February and April 2011 and submitted a report summarizing the results to PECO in May 2011. The investigation consisted installing additional permanent monitoring wells MW-6 and MW-7 along the southern and western borders. Findings are detailed below:

- Groundwater was detected above GWQS/GV for cis-1,2-DCE, MC, PCE, TCE, and VC at MW-6.
- The highest concentrations of PCE (2,300 ug/L) and TCE (39 ug/L) were detected at MW-2, located cross/downgradient of the former Anderson Cleaners.
- The second highest concentrations of PCE (1,200 ug/L) and TCE (28 ug/L) were detected at MW-6, located cross/downgradient of the former Whirley-Wash along the southern boundary of the Site.
- Soil was detected below MDLs except MC, which was detected at both borings below USCOs and PCE at MW-7 (12-14 fbgs) detected at 110 ppb below USCOs.

1.1.3.6 December 2011-January 2012 – Off-Site Site Investigation

Apex completed off-site investigation activities on the adjoining SFAP property, located south adjacent to the Site in December 2011 and submitted a report summarizing the results to the NYSDEC and Southside Station, Inc. in January 2012. The investigation consisted of four additional wells, MW-8, MW-9, MW-10A, and MW-11. Findings are detailed below:

- PCE concentrations at the off-site wells were lower than PCE concentrations observed in on-site downgradient concentrations. Groundwater was detected above GWQS/GV for PCE at MW-8 and MW-11.
- Soil was detected below MDLs except MC, which was detected at all borings below USCOs and PCE at MW-8 (10-12 fbgs), detected at 9.7 ppb below USCOs.

1.1.3.7 March-April 2012 – Sub-Slab Vapor Assessment

Apex completed a sub-slab vapor assessment in March 2012 and submitted a letter report to the NYSDEC and Southside Station, Inc. in April 2012. The assessment consisted of five sub-slab vapor investigation locations inside TOPS (SS-1 through SS-5). The owners of the SFAP denied access to the property for proposed off-site sub-slab vapor sampling. Findings are detailed below:

- Mitigation recommended for 1,2-DCE at SS-5, PCE at SS-4 and SS-5, and TCE at SS-5. Monitoring recommended for TCE at SS-4.

1.1.3.8 July 2012 – Off-Site Sub-Slab Vapor Assessment at Southside Foote Avenue Plaza

Apex completed a sub-slab vapor assessment at the adjoining SFAP property and submitted a report summarizing the results to the NYSDEC and Southside Station, Inc. in July 2012. The assessment consisted of four sub-slab vapor sample locations, two in the Salon 1 tenant space (SS-6 and SS-7) and two in the US Postal Service tenant space (SS-8 and SS-9). Findings are detailed below:

- Mitigation recommended for PCE and TCE at SS-6, and PCE at SS-7. Monitoring recommended for PCE at SS-9.

1.1.3.9 December 2012 – Phase I Environmental Site Assessment

EBI Consulting (EBI) completed a Phase I ESA for Five Mile Capital Partners, LLC (FMCP) dated December 2012. EBI identified the following RECs:

- The Site was historically occupied by a gas station, which was formerly located in the northern portion of the Site (at the location of the existing McDonald's restaurant).
- The Site was historically occupied by a dry cleaner, which was formerly located in the southern portion of the Site.
- The Site is listed as a Brownfield site. Groundwater at the Site is contaminated with PCE, TCE, and breakdown products. Several monitoring wells have been installed to characterize the extent of contamination.
- The Site is a Resource Conservation and Recovery Act (RCRA) non-generator, former RCRA-Large Quantity Generator (LQG), of halogenated solvents (including PCE and TCE).
- Six 55-gallon drums were observed along the rear wall of the strip mall.

1.1.3.10 May 2013 – Sub-Slab Depressurization System Installation Report

Apex submitted an Interim Remedial Measures (IRM) Work Plan to Southside Station, Inc. for the design, installation, and monitoring of a SSDS within TOPS in February 2013. The SSDS was installed on February 26 and 27, 2013 in conformance with the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Ref. 4). The system was constructed with three suction points along the southern property boundary (SP-1, SP-2, and SP-3). A U-tube style manometer installed at SP-3 indicated a vacuum of 1.3 inches water column. Apex noted that action should be taken if this measurement dropped significantly below its initial value. Initial performance testing was also conducted at test points and indoor air sample locations surrounding the SSDS to verify the system's effectiveness. Apex concluded these results indicated the SSDS was providing adequate vacuum to mitigate potential vapor intrusion of dry-cleaning solvent vapors at the Site and on the adjoining SFAP property. An email to Apex from Anthony Lopes of the NYSDEC transmitting indoor and outdoor air sample results on May 7, 2013 confirms this conclusion. The SSDS Installation Report was submitted to Southside Station, Inc. c/o PECO on May 1, 2013.

1.1.3.11 August 2013 – Addendum to Phase I ESA and NYSDEC Regulatory File Review

EBI completed an addendum to their December 2012 Phase I ESA for Kasowitz, Benson, Torres & Friedman LLP in August 2013. EBI updated their report by summarizing the activities completed at the Site by Apex (as discussed above). No further conclusions or recommendations were made.

1.1.3.12 August 2013 – Environmental Review and Comments

Bell Oldow completed a review of EBI's "Addendum to Phase I Environmental Site Assessment and New York State Department of Environmental Conservation Regulatory File Review" for FMCP in August 2013. The purpose of the review was to summarize environmental conditions at the Site for any potential new owners.

1.1.3.13 October 2014 – Phase I Environmental Site Assessment

AEI Consultants (AEI) completed a Phase I ESA for Kazmarek Mowrey Cloud Laseter LLP (KMCL) and LNR Partners, LLC (LNR) dated October 2014. AEI did not identify any on-site RECs at the Site. AEI identified the following controlled REC (CRECs):

- The Site was formerly occupied by a dry cleaner located at 736 Foote Avenue (Triangle/Anderson Cleaners) from the 1960s to the late 1970s. A second dry cleaner was located at 750 Foote Avenue (Whirley-Wash, formerly Anderson Cleaners, which apparently moved from 736 Foote Avenue to 750 Foote Avenue).
- PCE and TCE were observed at high concentrations in the sub-slab soil vapor. An SSDS was installed May 2013 in TOPS to mitigate PCE and TCE concentrations. Operation and Maintenance (O&M) requirements for the SSDS include periodic inspections and testing.
- PCE, TCE, cis-1,2-DCE, and VC were detected at concentrations exceeding GWQS/GV. The highest concentrations of TCE and PCE were observed directly downgradient of the former Whirley-Wash. At least seven wells were installed to characterize TCE and PCE contamination across the Site.
- The Site entered the NYS BCP and was assigned Site No. C907043.
- The gas station formerly located at the northern portion of the Site in the location of the existing McDonald's was identified as a historical REC (HREC). The gas station was identified as Bish's South Side Service Station and Cuifolo's Service Center gas station. The former gas station was identified as a HREC as no petroleum constituents were observed in the soil/groundwater.

1.1.3.14 May 2015 – Potential Source Area Investigation

Apex submitted a Source Area Investigation Work Plan in November 2013 and a Groundwater Delineation Work Plan in February 2014 to Southside Station, Inc. Apex completed source area investigation activities in April 2015 and submitted an investigation report to KMCL in May 2015. The investigation consisted of five soil borings (SB-9, SB-10, SB-12, SB-13, and SB-14). Three soil borings were converted into monitoring wells (MW-12, MW-13, and MW-14). Findings are detailed below:

- Groundwater was detected above GWQS/GV for PCE at all three locations, TCE at MW-12 and MW-13, and 1,1-dichloroethene (1,1-DCE), 1,1,1-TCA, cis-1,2-DCE, and trans-1,2-dichloroethene (trans-1,2-DCE) at MW-13.
- The highest concentration of PCE in groundwater was observed in on-site well MW-13 (32,000 ug/L).
- Soil was detected above USCOs for PCE at SB-12 (4-8 fbgs) and above RSCOs for PCE at SB-13 (6-10 fbgs).
- The highest concentrations of PCE were observed in the soil on the former Whirley Wash parcel; 1,300 ug/kg (SB-12; 4-8 ft interval) and 14,000 ug/kg (further downgradient SB-13; 6-10 ft interval).

1.1.3.15 July 2019 – Groundwater Sampling Results and Evaluation of SSDS

ATC Engineering, LLP (ATC) submitted a Groundwater Investigation Work Plan to the NYSDEC on January 30, 2019. ATC completed investigation activities in April 2019 and submitted an investigation report to LNR c/o KMCL in July 2019. ATC collected groundwater samples from previously installed MW-1, MW-2, MW-4, MW-6, MW-7, MW-9, MW-10A, MW-12, MW-13, and MW-14 and analyzed them for VOCs and emerging contaminants including 1,4-dioxane, and per- and polyfluoroalkyl substances (PFAS). The investigation also included an inspection of the SSDS and installation of three sub-slab monitoring points (SV-01 through SV-03) proximate to the three previously installed suction points (SP-1 through SP-3), and one indoor air sample (IA-01) within TOPS. Findings are detailed below:

- The depth to groundwater ranged between 2.91 to 6.87 fbgs.
- Groundwater flow direction was observed toward the northeast, consistent with previous investigations.
- cVOCs including cis-1,2-DCE, trans-1,2-DCE, PCE, and TCE were measured in groundwater samples retrieved from wells MW-1, MW-2, MW-6, MW-7, MW-12 and MW-13 at concentrations above the GWQS/GV of 5 µg/L.
- Former Whirley Wash Location: PCE concentrations at 621 ug/L (MW-12) and 27,100 ug/L (MW-13). Cross/downgradient well: PCE at 1,620 ug/L (MW-6).
- Former Anderson Cleaners Location: PCE concentration at 1,420 ug/L in cross/downgradient well (MW-2), and at 3,050 ug/L in further downgradient well (MW-1).
- 1,4-Dioxane was detected at one location and PFAS were detected at three locations at concentrations below the NYSDOH recommended maximum contaminant levels (MCLs).
- An adequate vacuum measurement was observed at SV-01 and SV-02; however, a vacuum measurement of 0.0 inches water column was observed at SV-03. Despite the potentially insufficient vacuum near SV-03, the SSDS was observed to be operating within normal range, with the U-tube style manometer at SP-3 reading at 1.7 inches water column. No visual observations were observed suggesting there were any problems associated with the SSDS and no CVOCs were detected in the indoor air, confirming that the SSDS was sufficiently reducing sub-slab vapor concentrations to a level protective of public health.

1.2 Purpose and Scope

This RI Report has been prepared on behalf of Southside to describe and present the findings of the 2020 RI activities and evaluate remedial alternatives for the Site. This Report contains the following sections:

- Section 2.0 presents the approach for the RI.
- Section 3.0 describes the physical characteristics of the Site as they pertain to the investigation findings.
- Section 4.0 presents the investigation results by media.
- Section 5.0 describes the fate and transport of the constituents of concern (COCs).
- Section 6.0 presents the qualitative on-site and off-site risk assessment.
- Section 7.0 evaluates the remedial alternatives.
- Section 8.0 provides a summary of the post-remedial requirements.
- Section 9.0 provides a list of references.

2.0 REMEDIAL INVESTIGATION APPROACH

The RI was completed across the BCP Site from April 16 to May 7, 2020 to supplement previous environmental data and delineate or identify areas requiring remediation. On-site field activities included a sewer evaluation; SSDS evaluation; soil boring advancement; surface, near-surface, and subsurface soil/fill sampling; soil vapor testing; monitoring well installation; and groundwater quality sampling.

Field team personnel collected environmental samples in accordance with the rationale and protocols presented in the NYSDEC-approved RI Work Plan. United States Environmental Protection Agency (USEPA) and NYSDEC-approved sample collection and handling techniques were used. Samples for chemical analysis were analyzed in accordance with USEPA SW-846 methodology with an equivalent Category B (Level IV) deliverable package to meet the definitive-level data requirements. Analytical results were evaluated by a third-party data validation expert in accordance with provisions described in the QAPP (Section 4.0 of the RI Work Plan).

Table 1 summarizes the RI sampling activities described below. Figure 3 presents the RI sample locations. Appendix B contains photographs of field activities.

2.1 Pre-Investigation Assessment

The limited pre-investigation assessment was conducted on March 27, 2020. A Benchmark-TurnKey scientist (Tom Behrendt) inspected the SSDS to ensure the system was working as designed prior to RI activities. Since groundwater monitoring wells MW-3, MW-5, MW-8 and MW-11 were not visible during the April 2019 investigation, Benchmark-TurnKey used a metal detector in the vicinity of these wells to locate the flush mount cover in the event they were covered by asphalt. Storm and sanitary sewer lines were located, and proposed sampling locations were confirmed and adjusted as needed. Benchmark-TurnKey returned on March 31 to meet with the owners of Salon-1.

Benchmark-TurnKey contacted the City of Jamestown Department of Public Works to obtain a Work in the Right of Way Permit for installation of temporary wells and soil vapor points along Foote Avenue and Cole Avenue. The Jamestown BPU provided information on the sanitary sewer laterals for the Site.

2.2 Soil/Fill Investigation

The soil/fill investigation included soil boring advancement with subsurface soil/fill sampling as well as surface/near-surface sampling. Appendix C includes the RI soil boring logs.

2.2.1 Surface/Near Surface Soil/Fill Investigation

The RI included collection of two surface and two near-surface soil samples (S-1/NS-1 and S-2/NS-2) collected from the non-hardscape area in the southwest corner of the Site on April 28, 2020. Surface soil samples were collected from 0 to 2 inches below the vegetative cover (if present) and near-surface soil samples were collected from 2 to 12 inches below ground surface.

Each location was hand-augered and a representative aliquot of soil was collected using a dedicated stainless-steel spoon. Sample location S-2 had a vegetated surface, which was removed prior to sample collection. Representative samples were described in the field by qualified Benchmark-TurnKey personnel, scanned for total volatile organic vapors with a calibrated MiniRae 3000 PID equipped with a 10.6 eV lamp (or equivalent), and characterized for impacts via visual and/or olfactory observations. Samples were transferred to laboratory supplied, pre-cleaned sample containers for analysis. RI samples were analyzed for Target Compound List (TCL) SVOCs plus tentatively identified compounds (TICs) and Target Analyte List (TAL) metals, polychlorinated biphenyls (PCBs), pesticides, herbicides, 1,4-dioxane and PFAS using USEPA SW-846 methodology. No samples were analyzed for TCL VOCs since no elevated PID readings (>0 ppm) were detected during field screening.

2.2.2 Subsurface Soil/Fill Investigation

2.2.2.1 Soil Boring Advancement

Seventeen soil borings (SBs) were advanced across the Site from April 17 to 28, 2020. Two borings (SB-27 and SB-28) were completed inside TOPS and two borings (SB-29 and SB-30) were completed inside Salon-1, the off-site building adjoining TOPS to the south. Interior borings were completed with a mobile direct-push rig. The remaining borings (MW-1D and SB-15 through SB-26) were completed on-site exterior to the buildings. The exterior borings were advanced using a traditional hollow stem auger (HSA) drill rig to refusal, which

ranged between 7 and 20.5 feet below ground surface (fbgs). Boring MW-1D was to be completed as a deep overburden groundwater monitoring well to be paired with existing well MW-1; however, the depth to refusal was the same as the depth of well MW-1 so it was not completed as a well. An additional five soil borings were converted to monitoring wells as discussed in Section 2.3. Upon boring completion, excess soil was returned to the borehole then it was sealed with black top cold patch to match existing grade.

Soil/fill samples were obtained by driving a 1 3/8-inch I.D. by 24-inch long split spoon sampler 24 inches ahead of the lead cutting shoe of the HSA, in general accordance with ASTM D1586. Soil samples were collected at approximate 2-foot intervals to the bottom of the boring for classification and screening with the PID. Select samples were collected for analytical testing based on location, visual and olfactory observations, and/or field (PID) screening.

2.2.2.2 Subsurface Soil/Fill Sampling and Analyses

Subsurface soil/fill samples were collected using dedicated stainless-steel sampling tools. Representative samples were placed in pre-cleaned laboratory provided sample bottles, cooled to 4ºC in the field, and transported under chain-of-custody command to Eurofins/ TestAmerica Laboratory in Amherst, NY, a NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified analytical laboratory. Select soil/fill samples were analyzed for TCL plus CP-51 List VOCs plus TICs, TCL SVOCs plus TICs, TAL metals, PCBs, pesticides, herbicides, 1,4-dioxane, and PFAS. A limited number of subsurface soil samples were also submitted for analysis of total organic carbon (TOC), heterotrophic plate count (HPC), and soil oxidant demand (SOD) to assist in selecting potential remedial alternatives.

2.3 Soil Vapor Investigation

Ten soil vapor sample locations were planned for the RI: seven on-site along the west, north and east property boundaries (SV-01 to SV-07) and three off-site along the east side of Foote Avenue (SV-08 to SV-10).

2.3.1 Soil Vapor Point Installation

On April 16, 2020 soil vapor sampling probes were installed in general conformance with the 2006 NYSDOH Soil Vapor Intrusion Guidance (Ref. 4). Sampling equipment included 6-inch long stainless steel well screens, ¼-inch inside diameter inert sample tubing, and dedicated 6-liter Summa canisters. Boreholes were advanced to approximately 5 fbgs using ¾-inch inside diameter steel rods. The steel rod was equipped with an anchor point at the driving end of the rod. The anchor point was connected to the sampling screen and tubing on the inside of the steel rod. Once the steel rod was advanced to 5 fbgs, the steel rod was retracted, leaving the anchor point, sampling screen and sampling tubing within the borehole annulus. The vapor points were screened from 1.5 to 2 fbgs. Glass beads were poured around the sampling screen in a manner to cover the entire length of the sampling screen. Bentonite was placed above the glass beads (beginning at approximately 1 fbgs) to the ground surface to create a seal to prohibit infiltration of ambient air into the sampling area. Once the sample probes were installed, the probe and tubing were purged (three volumes) using a calibrated syringe as required by the NYSDOH guidance. Helium tracer gas was used during the purging phase to ensure that the probes were well sealed.

2.3.2 Soil Vapor Sample Collection and Analysis

Samples were collected over an approximate 4-hour period and analyzed by USEPA Method TO-15. This method employs a 6-liter, passivated (inert), stainless-steel, evacuated sampling sphere for collecting the air samples. The canister is received from the laboratory, certified clean, evacuated, and prepared for sampling. The pressure in the canister was set to approximately 50 millitorr (compared to 760 torr of pressure in the atmosphere at sea level).

The canisters were then fitted with a sampling valve that used a critical orifice and mass flow controller to regulate the air flow into the canister. The orifice was selected by size to allow for the selected 4-hour sampling period. The mass flow controller helps maintain relatively constant air flow rates throughout the sampling period. The canisters were then placed at the soil vapor sampling locations for sampling.

At the end of the 4-hour sampling period the canister pressure had not changed at locations SV-06 and SV-07 along the western boundary due to water in the borehole. Benchmark-TurnKey attempted to remove the water with a peristaltic pump but was unsuccessful; therefore, no sample was submitted for analysis and Benchmark-TurnKey

notified NYSDEC. Based on input from NYSDEC and NYSODH, Benchmark-TurnKey attempted to remove the water from these boreholes on April 24 and May 4; however, the water remained so no sample was collected.

Concurrent with the soil vapor sampling, one outdoor field-located ground level air sample was collected at southeast of SV-06 near well MW-4, which on the day of the sampling was upwind of the soil vapor sampling locations. Following sample collection, the Summa canisters were shipped to Eurofins/TestAmerica in South Burlington, VT for analysis of USEPA TCL VOCs in accordance with USEPA Method TO-15.

2.4 Groundwater Investigation

The RI included installation of 5 of the 8 planned on-site groundwater monitoring wells to investigate groundwater flow and quality (see Figure 3). Between April 16 and 21, 2020 five shallow overburden wells (MW-15 through MW-19) were installed. The three planned deep overburden wells (MW-1D, MW-6D, and MW-18D) were abandoned since the confining layer was found at 20-22 fbgs, which is the depth of the existing groundwater monitoring wells. This modification to the RI Work Plan was approved by NYSDEC in an email dated April 2. Five of the 10 existing monitoring wells were buried under asphalt. On April 20, wells MW-3, MW-5, MW-6, MW-8, and MW-11 were uncovered, and the road boxes were repaired.

The off-site investigation included installation of two shallow overburden monitoring wells (MW-20 and MW-21) in the neighboring Salon-1 building and four temporary shallow overburden wells (TW-1 to TW-4) along Cole Avenue and Foote Avenue on April 21. A fourth off-site temporary well (TW-4) was installed June 5, 2020 following receipt of non-detect results for the other three temporary wells. The location for TW-4 at the northeast corner of Cole Avenue and Foote Avenue was selected based on the groundwater flow direction and the presumed leading edge of the PCE plume.

2.4.1 Monitoring Well Installation

Each exterior well was constructed with two-inch diameter Schedule (SCH) 40 PVC with a minimum 10-foot flush joint SCH 40 PVC 0.010-inch machine-slotted well screen. Interior monitoring wells (MW-20 and MW-21) were installed as one-inch diameter wells due to space and drilling equipment requirements. Temporary wells (TW-1 to TW-4) were also installed as one-inch diameter wells. Each permanent well screen and attached riser was placed

at the bottom of the borehole and a silica sand filter pack (size #0) was installed from the base of the well to a maximum of two feet above the top of the screen. A bentonite chip seal was installed and allowed to hydrate sufficiently to mitigate the potential for downhole grout contamination. The newly installed monitoring wells were completed with a lockable J-plug, keyed-alike locks, and a steel flush mounted road box. Table 2 summarizes the monitoring well construction details. Appendix C includes the monitoring well completion logs.

2.4.2 Monitoring Well Development

The newly installed and uncovered existing monitoring wells were developed April 23 and 24, 2020 to remove residual sediments and to ensure good hydraulic connection with the water-bearing zone. The wells were developed in accordance with Benchmark-TurnKey and NYSDEC protocols. Development of the exterior 2-inch diameter monitoring wells was accomplished with polyethylene bailers via surge and purge methodology. The two interior 1-inch wells were developed using a peristaltic pump. Field parameters including pH, oxidation-reduction potential (ORP), dissolved oxygen (DO), temperature, turbidity, and specific conductance were measured periodically (i.e., every well volume or as necessary) during development. Field measurements continued until they became relatively stable. Stability was defined as variation between measurements of approximately 10 percent or less with no overall upward or downward trend in the measurements. A minimum of three well volumes were evacuated from each monitoring well. Appendix D includes the well development logs.

2.4.3 Groundwater Sample Collection

NYSDEC requested a minimum of one week between well development and sampling; therefore, the wells were sampled May 4-7, 2020. Prior to sample collection on May 4, 2020 static water levels were measured in all wells to interpret groundwater flow direction within the overburden soil/fill. Following water level measurement, Benchmark-TurnKey personnel purged and sampled the wells using a submersible pump and dedicated tubing following low-flow/minimal drawdown purge procedures; groundwater was evacuated from each well at a low-flow rate (typically less than 0.1 L/min). Field measurements for pH, ORP, specific conductance, temperature, turbidity, and DO were periodically monitored for stabilization. Visual and olfactory field observations were also recorded. Purging was considered complete when pH, specific conductivity, and temperature stabilized, and when turbidity measurements

fell below 50 Nephelometric Turbidity Units (NTU) or became stable above 50 NTU. Upon stabilization of field parameters, groundwater samples were collected from off-site temporary wells TW-1 to TW-3 on April 21, 2020 and all other wells on May 4 through 7, 2020. Temporary off-site well TW-4 was sampled on June 5, 2020. Immediately before sample collection, field parameters and visual and olfactory field observations were recorded.

Groundwater samples were placed in pre-cleaned, pre-preserved laboratory provided sample bottles, cooled to 4°C in the field, and transported under chain-of-custody command to Eurofins/TestAmerica for laboratory analysis.

2.4.4 Groundwater Sample Analyses

Groundwater samples collected from all monitoring wells were analyzed for TCL plus CP-51 List VOCs, TCL SVOCs plus TICs, TAL metals, PCBs, pesticides, herbicides, 1,4-dioxane (via EPA Method 8270 SIM) and PFAS (via Modified EPA Method 537) at 9 of the 17 shallow overburden monitoring wells and 2 (i.e., one up-gradient, one down-gradient) of the 3 deep monitoring wells. Groundwater from well MW-13 (presumed source area) was also submitted for analysis of cVOC degraders, dissolved metals, dissolved gases, and general chemistry to assist in selecting potential remedial alternatives.

2.4.5 Slug Testing

On May 4, 2020 Benchmark-TurnKey personnel performed rising-head slug tests manually using a bailer and stopwatch to determine hydraulic conductivity. The tests were performed at two upgradient, non-impacted groundwater monitoring wells: MW-4 (screened in the silty sand/gravel) and MW-9 (straddles the silty sand and shale rock). On May 7, 2020 Benchmark-TurnKey performed rising-head slug tests on the same two wells using a Level Troll 700.

2.5 Field Specific Quality Assurance/Quality Control Sampling

In addition to the soil/fill, soil vapor, and groundwater samples described above, field-specific quality assurance/quality control (QA/QC) samples were collected (see Table 1) and analyzed to ensure the reliability of the generated data and to support the required third-party data usability assessment effort. Site-specific QA/QC samples include matrix spikes, matrix spike duplicates, blind duplicates, and trip blanks in accordance with the NYSDEC-approved

RI Work Plan. A Category B (Level IV) deliverable package was provided for all samples collected to allow third-party data validation and provide defensible data.

2.6 Decontamination & Investigation-Derived Waste Management

Every attempt was made to use dedicated sampling equipment during the RI; however, non-dedicated equipment that was required and/or used (e.g., hollow stem augers) was decontaminated with a non-phosphate detergent (i.e., Alconox®) and potable water mixture, rinsed with distilled water, and air-dried before each use in accordance with the field operating procedure (FOP).

Investigative-derived waste (IDW) generated during the RI consisted of soil cuttings from drilling and groundwater from well development and purging. Soil cuttings were minimized by reversing the augers out of the boring. Since none of the soil cuttings exhibited gross contamination (i.e., visible product, odor, sheen, elevated PID, etc.), it was returned to the borehole from which it was removed. Excess cuttings and well development and purge water were placed in sealed NYSDOT-approved drums and labeled for subsequent disposal. All generated IDW drums were labeled alpha-numerically with its contents, origin, and date of generation using a paint stick marker. Drums are securely staged on-site along the western side of the building pending characterization analyses and remedial measures assessment.

Discarded personal protective equipment (PPE) (i.e., latex gloves, Tyvek, paper towels, etc.) and disposable sampling equipment (i.e., bailers) were placed in sealed plastic garbage bags and disposed as municipal solid waste.

2.7 Site Mapping

On April 28, 2020 Benchmark -TurnKey personnel employed a Trimble GeoXH handheld GPS unit to identify the locations of all soil borings, sample points, and groundwater monitoring wells relative to State planar grid coordinates. On April 30, 2020 Benchmark-TurnKey used a TOPCON slope laser and rod to survey the elevations of the new groundwater water monitoring wells, five existing wells that were repaired, surface where borings were completed, building floors, and storm sewer inlets. Isopotential maps showing the general direction of groundwater flow were prepared based on water level measurements relative to USGS vertical datum (see Figure 4).

3.0 SITE PHYSICAL CHARACTERISTICS

The physical characteristics of the Site observed during the RI are described in the following sections.

3.1 Site Topography and Drainage

The Site is situated within the Allegheny Plateau province of western New York within the Allegheny Watershed (USGS 05010001). The Site is generally flat lying with topographic relief sloping toward Foote Avenue. Exterior surfaces are primarily covered with asphalt, with few small areas covered with green space. Precipitation (i.e., rain or melting snow) primarily moves to storm drains in the parking lots and roadways via overland flow; minimal precipitation infiltrates the ground surfaces. Surface and shallow groundwater flow are likely affected by various cycles of development and filling, as well as utility trenches and building foundations.

3.2 Geology and Hydrogeology

3.2.1 Overburden

The Site is located within the glaciated Allegheny Plateau. The Allegheny Plateau is an eroded plateau typified by sharp relief with highly varied elevations ranging from 4,000 feet in the unglaciated Allegheny Plateau, to less than 100 feet in the glaciated Allegheny Plateau. The surficial geology of the glaciated Allegheny Plateau has developed from glacial till. According to the United States Department of Agriculture (USDA) web soil survey (Ref. 5), Site soils are characterized primarily as Fremont silt loam (FmA) with a small portion of the Site soils characterized as Schuyler silt loam (ShC). Fremont silt loam is characterized as a somewhat poorly drained soil with 0 to 3 percent slopes. The Schuyler silt loam is characterized as a moderately well drained soil with 8 to 15 percent slopes.

The geology at the Site was investigated during the RI. The overburden is generally described as gray to brown sandy silt and clayey silt with some gravel. The overburden extends from ground surface to approximately 7 to 11 fbgs in the southwestern (upgradient) portion of the Site and ranges between 14 and 20 fbgs in the northeastern portion of the Site. The overburden overlies gray weathered shale. Appendix C includes soil boring logs.

3.2.2 Bedrock

The Site is situated over the Onondaga Formation of the Conneaut group. The Conneaut group is comprised of Upper Devonian-aged shale, sandstone, and siltstone. During the RI, gray weathered shale was observed beneath the overburden at all sample locations, ranging between 7 fbgs at soil boring SB-24 (southwestern portion of the Site) and 20.5 fbgs at boring MW-1D (northeastern corner of the Site). This weathered shale was encountered between 6 and 16 fbgs during previous investigations.

3.2.3 Hydrogeology

The Site is located within the Allegheny River major drainage basin, which is typified by high topographic relief. In the Allegheny River Basin, the major areas of groundwater are within coarser overburden deposits and sandstone and shale bedrock. Based on the findings of the RI, groundwater was encountered in Site overburden from 3.43 fbgs (MW-12) at the southern end to 9.28 fbgs (MW-5) at the northern end. The groundwater was observed flowing northeast across the Site toward the Chadakoin River. As shown on Figure 4, groundwater flows in a northeast direction through the upgradient (southwestern) portion of the Site then turns and flows in a northerly direction. Figure 4 was prepared using the groundwater elevations measured on May 7, 2020. Based on slug tests performed manually and with a pressure transducer, the average hydraulic conductivity at upgradient well MW-4 is approximately 6.8×10^{-6} ft/sec and at well MW-9 is 4.2×10^{-6} ft/sec. Appendix D includes the hydraulic conductivity calculations.

4.0 INVESTIGATION RESULTS BY MEDIA

The nature and extent of contamination at the Site was further characterized using samples collected and analyzed as part of the RI. The soil, groundwater, and soil vapor samples collected during the RI sampling events were submitted for analyses under chain-of-custody to a NYSDOH ELAP-certified laboratory. Analytical services were performed in accordance with SW-846 analytical methods and protocols. Tables 3 through 6 summarize the analytical results by media. Appendix E contains the RI laboratory analytical data packages. Figure 3 shows the RI sampling locations. Appendix A includes the data summary tables from previous investigations.

4.1 Pre-Investigation Assessment

On March 27, 2020, Benchmark-TurnKey scientist Tom Behrendt inspected the SSDS to ensure the system was working as designed prior to RI activities. The U-tube style manometer installed at SP-3 read 1.7 inches of water column, verifying the SSDS is providing adequate vacuum to mitigate potential soil vapor intrusion into Building 1.

ATC could not locate groundwater monitoring wells MW-3, MW-5, MW-8, and MW-11 during their April 2019 investigation. On March 27, 2020 Mr. Behrendt used a metal detector in the vicinity of these wells (and MW-6) to locate the flush mount cover as they may have been covered by asphalt. The metal detector registered a hit in the general vicinity of each location. The property manager (Mr. Gary Davis), who has been involved with the property for about 20 years, indicated approximately 4 to 6 inches of asphalt have been laid since the wells were last accessed. Well MW-3 was visible; however, the road box was damaged and filled with asphalt. Since wells MW-8 and MW-11 are off-site, approval from the property owner to uncover the wells was required.

On April 14, 2020 Mr. Behrendt met with the owners of Salon-1, the off-site tenant space adjoining TOPS to the south, to review the proposed locations for the planned interior soil borings and monitoring wells.

4.2 Surface/Near-Surface Soil Analytical Results

Table 3 summarizes the surface (0-2 inches) and near-surface (2-12 inches) soil sample results from the RI and compares the values to NYSDEC Part 375 USCOs and CSCOs.

Historically, only one near-surface soil sample (SB-9; 0-2') was collected and analyzed for VOCs; all concentrations were well below USCOs.

4.2.1 Semi-Volatile Organic Compounds

SVOCs were detected in 3 of the 4 surface/near-surface soil samples analyzed; however, all results were below USCOs. SVOC TICs were identified in 3 samples ranging from 4.9 mg/kg at near-surface sample NS-1 to 200 mg/kg at surface sample S-2.

4.2.2 Inorganic Compounds

Inorganic compounds (metals) are naturally occurring and were detected in all four surface/near-surface samples analyzed. Chromium and zinc were detected at concentrations above Part 375 USCOs at surface sample S-2. Nickel was also detected in this sample at a concentration of 402 mg/kg, which is above its CSCO (310 mg/kg).

4.2.3 Pesticides, Herbicides, and PCBs

One pesticide (4,4'-DDT) was detected in surface sample S-2 and near-surface sample NS-2 at estimated concentrations above the USCO. Herbicides were not detected in any of the four surface/near-surface soil samples analyzed. PCBs (Aroclor 1248) were only detected in sample S-1 but at a concentration well below the USCO.

4.2.4 PFAS and 1,4-Dioxane

PFAS compounds were detected in all four surface/near-surface soil samples. Total PFOA plus PFOS concentrations ranged from 1.3 ug/kg (NS-1) to 2.9 ug/kg (NS-2). Total PFAS concentrations ranged from 1.6 ug/kg (NS-1) to 4.7 ug/kg (S-2). 1,4-Dioxane was not detected above laboratory detection limits.

4.2.5 Surface/Near-Surface Soil Summary

As described above, nickel was the only contaminant detected above its CSCO. The detection was in a surface soil sample in the southwestern corner of the Site. Chromium, zinc, and 4,4'-DDT were the only contaminants detected above USCOs.

4.3 Subsurface Soil/Fill Analytical Results

Table 4 summarizes the RI subsurface soil/fill sample results and compares the values to NYSDEC Part 375 USCOs and CSCOs.

4.3.1 Volatile Organic Compounds

Between 2008 and 2015, various investigations analyzed subsurface soil/fill samples for VOCs; however, the only detections at or above USCOs/Protection of Groundwater (PGW) SCOs was PCE in 2015 at SB-12 (1.3 mg/kg, 4-8') and SB-13 (14 mg/kg, 6-10') during well installation.

During the RI, PCE was the only VOC detected above its USCO/PGWSCO (1.3 mg/kg) at seven locations during the RI with concentrations ranging from 1.9 mg/kg (MW-1D; 12-14') to 8.2 mg/kg (SB-25; 12-16'). VOC TICs were identified in two samples; 0.048 mg/kg (SB-26; 2-4') and 0.23 mg/kg (SB-23; 10-12').

4.3.2 Semi-Volatile Organic Compounds

Historically, the only soil/fill sampling event that analyzed samples for SVOCs was in 2008; no SVOCs were detected in the four soil/fill samples.

Only sample SB-22 (2-4') contained SVOC concentrations above USCOs, with only benzo(a)pyrene and dibenz(a,h)anthracene detected at concentrations slightly above CSCOs. The total SVOC concentration in SB-22 is 55 mg/kg, which is an order of magnitude lower than the allowable SCO of 500 mg/kg total polycyclic aromatic hydrocarbons (PAHs) for BCP sites being remediated to a Track 4 (non-residential) cleanup track. SVOC TIC concentrations ranged between non-detect and 4.0 mg/kg (MW-1D; 12-14').

4.3.3 Inorganic Compounds

The following metals were detected at concentrations above USCOs: arsenic (2), barium (2), copper (1), lead (1), manganese (2), and nickel (4). The only detections above CSCOs were arsenic at an estimated concentration of 49.3 mg/kg (MW-17; 8-10'), which is above its CSCO of 16 mg/kg, and barium at concentrations of 889 mg/kg (SB-23; 10-12') and 1,450 mg/kg (SB-15; 12-14'), which are above its CSCO of 400 mg/kg. All exceedances are at locations covered by asphalt pavement.

4.3.4 Pesticides, Herbicides, and PCBs

4,4'-DDT was the only pesticide detected above its USCO; both SB-18 (0.5-2') and SB-26 (2-4') were flagged as estimated. No pesticides exceeded CSCOs. Herbicides and PCBs were not detected in any subsurface soil/fill samples.

4.3.5 PFAS and 1,4-Dioxane

PFAS compounds were detected in 5 of the 8 subsurface soil/fill samples analyzed. Total PFOA plus PFOS concentrations ranged from non-detect to 0.17 ug/kg (SB-18; 0.5-2' and MW-21; 8-12'). Total PFAS concentrations ranged from non-detect to 0.24 ug/kg (SB-18; 0.5-2'). 1,4-Dioxane was not detected above laboratory detection limits.

4.3.6 Subsurface Soil/Fill Summary

As described above, benzo(a)pyrene, dibenz(a,h)anthracene, arsenic, and barium were the only contaminants detected above CSCOs in subsurface soil/fill. Benzo(a)pyrene was detected in one sample collected from 2-4 fbgs, is attributable to urban fill, and is covered by asphalt pavement. The arsenic (1) and barium (2) exceedances were at depth (8-14 fbgs), tend to be ubiquitous in urban fill, and are covered by asphalt pavement. PCE was detected above its PGWSCO in saturated soil/fill (8-16 fbgs) in the presumed source area and along the groundwater plume, with the highest concentration (14 mg/kg) detected in the saturated 6 to 10-foot interval prior to installation of well MW-13 in 2015. None of the concentrations suggest a soil/fill source.

4.4 Soil Vapor Results

Seven on-site soil vapor samples were collected along the west, north and east property boundaries to complete a qualitative off-site exposure assessment. To supplement this assessment, three off-site soil vapor samples were collected on the east side of Foote Avenue.

New York State currently does not have any standards, criteria, or guidance values for concentrations of compounds in soil vapor. Additionally, there are currently no databases available of background levels of volatile chemicals in soil vapor. NYSDOH's October 2006 Soil Vapor Intrusion (SVI) guidance document states that in the absence of this information, soil vapor sampling results are reviewed "as a whole," in conjunction with the results of other environmental sampling to identify trends and spatial variations in the data. The document

also indicates that to put some perspective on the data, soil vapor results might be compared to background outdoor air levels, site-related outdoor air sampling results, or the NYSDOH's air guidelines values.

4.4.1 On-Site Soil Vapor

On April 16, 2020 five of the seven planned on-site soil vapor samples were collected for analysis of VOCs in accordance with USEPA Method TO-15. As discussed in Section 2.3.2, no vapor sample was collected from SV-06 and SV-07 due to water in the borehole and a suspected perched water condition. An outdoor air sample was collected upwind of the soil vapor samples at the location shown on Figure 3.

Table 5 summarizes the VOC concentrations in the soil vapor with a comparison to the available NYSDOH air guideline values for methylene chloride, PCE, and TCE. None of the sample concentrations exceed these guideline values. The highest concentration of PCE in the soil vapor is 12 ug/m^3 (SV-04 located on the eastern property boundary in the center of the Site), which is well below the air guideline value of 30 ug/m^3. TCE was not detected in the soil vapor at this location.

4.4.2 Off-Site Soil Vapor Results

As summarized on Table 5, none of the samples exceeded the air guideline concentrations. Off-site soil vapor PCE concentrations were a magnitude lower than on-site sample SV-04. TCE concentrations were lower than the highest on-site location (SV-05).

4.4.3 Soil Vapor Summary

None of the on-site or off-site soil vapor samples exceeded the NYSDOH air guideline values. The outdoor air sample did not contain PCE; however, PCE was detected in all soil vapor samples at low concentrations (i.e., less than 1.7 ug/m^3 except for one sample at 12 ug/m^3). The highest concentration of PCE in soil vapor (SV-04) does not correspond to the highest concentration of PCE in groundwater or subsurface soil/fill. Since the off-site soil vapor concentrations are generally lower than on-site and off-site groundwater is not impacted by cVOCs, an off-site soil vapor intrusion study does not appear to be warranted and no additional soil vapor sampling is recommended.

4.5 Groundwater Results

Between April 16 and June 5, 2020, five on-site shallow overburden wells (MW-15 through MW-19), two off-site shallow overburden wells (MW-20 and MW-21), and four off-site temporary shallow overburden wells (TW-1 to TW-4) were installed. Newly installed monitoring wells and historic monitoring wells installed by others (25 total monitoring wells) were sampled during the RI. Table 6 presents a comparison of the detected groundwater concentrations in monitoring wells to the Class GA GWQS/GVs.

4.5.1 Field Observations

As indicated on the groundwater field forms in Appendix D, no product was observed in the wells during development or sampling. Prior to sampling, the water was still turbid in several wells; turbidity is attributed to the clay/silt overburden. The samples collected for metals analysis were filtered by the laboratory and analyzed for dissolved metals. No odors were recorded during sampling. Interior 1-inch diameter off-site wells MW-20 and MW-21 were slow to recharge during development. Table D-1 summarizes the field parameters measured prior to sampling.

4.5.2 Groundwater Flow Direction

As shown on Figure 4, groundwater flows in a northeast direction through the upgradient (southwestern) portion of the Site then turns and flows in a northerly direction based on the groundwater elevations measured May 4, 2020. The groundwater flow direction during the April 2019 sampling event by ATC was toward the northeast.

4.5.3 Volatile Organic Compounds

Historically, cis-1,2-DCE, trans-1,2-DCE (only well MW-6), PCE, and TCE have been detected in wells MW-1, MW-2, MW-6, MW-7, MW-12, and MW-13 at concentrations above the GWQS. The highest concentrations have been observed at well MW-13 (32,000 ug/L in 2015 and 27,000 ug/L in 2019). The concentration in nearby well MW-12 has fluctuated between 4,200 ug/L in 2015 to 621 ug/L in 2019.

Only three VOCs were detected above GWQS/GVs in the 25 samples analyzed during the RI: cis-1,2-dichloroethene, PCE, and TCE. Cis-1,2-Dichloroethene was detected at estimated concentrations above its GWQS (5 ug/L) in wells MW-1 (24 ug/L) and MW-21 (8.2

ug/L). PCE was detected at concentrations above its GWQS (5 ug/L) in 13 wells with concentrations ranging from 18 ug/L (MW-8) to 76,000 ug/L (MW-13). No VOCs were detected in off-site temporary wells above GWQS/GVs. TCE was detected at concentrations above its GWQS (5 ug/L) in eight wells with concentrations ranging from 5.4 ug/L (MW-3) to 79 ug/L (MW-16). Figure 5 is a PCE isoconcentration map illustrating the estimated extent of the groundwater plume, which is relatively narrow and does not appear to flow off-site to the east side of Foote Avenue. VOC TICs were not identified in any monitoring wells.

4.5.4 Semi-Volatile Organic Compounds

SVOCs were not detected above GWQS/GVs. SVOC TICs were identified at several monitoring well locations with concentrations ranging from non-detect to 403 ug/L (MW-17).

4.5.5 Inorganic Compounds

Groundwater samples were filtered by the laboratory and analyzed for dissolved metals. Dissolved barium, magnesium, and sodium were detected at concentrations above GWQS/GVs. However, these compounds are naturally occurring minerals typically found in groundwater in New York State.

4.5.6 Pesticides, Herbicides, and PCBs

Herbicides and PCBs were not detected at concentrations above laboratory detection limits. Pesticides were detected in seven wells but at concentrations below GWQS/GVs.

4.5.7 PFAS and 1,4-Dioxane

PFAS compounds were detected in all 11 groundwater samples analyzed during the RI. PFOA concentrations in wells MW-12, MW-14, and MW-19 (blind duplicate) and PFOS concentrations in wells MW-12 and MW-14 exceeded the proposed drinking water standard of 10 nanograms per liter (ng/L). The NYSDEC PFOA + PFOS action level of 70 ng/L was only exceeded at well MW-12 (106 ng/L). Total PFAS concentrations did not exceed the NYSDEC action level of 500 ng/L in any well; in fact, the highest total PFAS concentration was 186 ng/L (MW-12). 1,4-Dioxane was detected in one sample but at a concentration below its GWQS.

In 2019, PFAS compounds were detected at similar concentrations and only one well (MW-1) contained 1,4-dioxane but at a concentration below its GWQS.

4.5.8 Groundwater Summary

As described above, the following contaminants were detected in groundwater at concentrations above GWQS/GVs: cis-1,2-dichloroethene, PCE, TCE, barium, magnesium, sodium, PFOA, and PFOS. The metals detected in limited wells are naturally occurring. Total PFOA/PFOS only slightly exceeded the action level in one well. The only groundwater contaminants of significance are the cVOCs, which were detected on the eastern portion of the Site. The cVOCs in groundwater are the remedial drivers for the Site.

4.6 Data Usability Summary

In accordance with the RI Work Plan, the laboratory analytical data from this investigation was submitted for independent review. Data Validation Services (DVS) located in North Creek, New York performed a data usability summary assessment, which involved a review of the summary form information and sample raw data, and a limited review of associated QC raw data. Specifically, the following items were reviewed:

- Data completeness
- Case narrative
- Custody documentation
- Holding times
- Surrogate, isotopic dilution, and internal standard recoveries
- Method/preparation/canister blanks
- Matrix spike recoveries/duplicate correlations
- Blind field duplicate correlations
- Laboratory control sample (LCS)
- Instrumental tunes
- Initial and continuing calibration standards
- Canister pressures
- Serial dilution evaluation
- Method compliance
- Sample results verification

The Data Usability Summary Report (DUSR) in Appendix F was prepared using guidance from the USEPA Region 2 validation Standard Operating Procedures, USEPA National Functional Guidelines for Data Review, and professional judgment. The DUSR indicates the sample analyses were primarily conducted in compliance with the required analytical protocols, and data completeness, representativeness, accuracy, reproducibility, sensitivity, and comparability are acceptable.

In summary, the RI sample results are usable either as reported or with minor qualification. However, many of the soil pesticide analyses, and some of the soil semi-volatile analyses were performed at dilution due to the sample matrix, resulting in significantly elevated reporting limits.

4.7 Constituents of Concern (COCs)

Based on the findings related to the historic use of the Site, previous investigations, and this RI, the constituents of concern (COCs) are presented below:

- **Surface Soil**: Nickel (one discrete location)
- **Subsurface Soil/Fill**: PCE
- **Groundwater**: PCE, TCE

5.0 FATE AND TRANSPORT OF COCS

The surface/near-surface soil, subsurface soil/fill, groundwater, and soil vapor analytical results were incorporated with the physical characterization of the Site to evaluate the fate and transport of the COCs in Site media. The mechanisms by which the COCs can migrate to other areas or media are briefly outlined below.

5.1 Fugitive Dust Generation

Volatile and non-volatile chemicals present in soil can be released to ambient air from fugitive dust generation. Historic use of the Site has impacted subsurface soil/fill and, as such, fugitive dust generation during intrusive activities related to remediation is considered a relevant potential short-term migration pathway.

Particulate monitoring in accordance with the approved Community Air Monitoring Plan (CAMP) will be completed during intrusive activities and, if required, dust mitigation measures will be employed during future remediation.

5.2 Volatilization

Volatile chemicals present in soil/fill and groundwater may be released to ambient or indoor air through volatilization either from or through the soil/fill underlying building structures. Volatile chemicals typically have a low organic-carbon partition coefficient (K_{oc}), low molecular weight, and a high Henry's Law constant, meaning they have a propensity to migrate through the vadose zone (unsaturated zone below ground).

VOCs were detected in subsurface soil/fill above PGWSCOs and PID measurements were recorded above background at some locations. In addition, groundwater samples contain cVOCs above Class GA GWQS/GVs and soil vapor samples indicate the presence of VOCs. The results of the RI together with the need for the current SSDS beneath the TOPS building indicated that soil-to-air and groundwater-to-air pathways are relevant primarily in the presumed source area. The soil vapor concentrations at the property boundary and off-site are relatively low and VOCs in off-site groundwater do not exceed GWQS/GV; therefore, off-site volatilization is not a concern.

5.3 Surface Water Runoff and Transport

Precipitation (i.e., rain or melting snow) primarily moves to storm drains in the parking lots and roadways via overland flow. The only area where precipitation can infiltrate the ground surface is in the small dirt/vegetated area in the southwest corner of the Site. Under the current use scenario, the potential for soil particle transport with surface water runoff is low, as the Site is primarily covered in asphalt.

Under the reasonably anticipated future commercial use scenario, the Site will continue to be substantially covered by hardscape (asphalt, buildings, etc.), mitigating transport of subsurface soil/fill via storm water runoff. Although storm water runoff during remediation activities is possible during the future use scenario, erosion controls would be implemented as a component of the remedy and Site Management Plan (SMP).

Therefore, surface water runoff is not considered a relevant potential migration pathway.

5.4 Leaching

Leaching refers to compounds present in soil/fill migrating downward to groundwater due to infiltrating precipitation. PCE and certain metals were detected in subsurface soil/fill above PGWSCOs and CSCOs, respectively. Of these soil/fill contaminants, only PCE and barium were detected at concentrations above GWQS/GVs. As discussed in Section 4.4.5, barium is naturally occurring in NYS groundwater (Ref. 6).

Although PCE is present in both subsurface soil/fill and groundwater, the Site is almost entirely covered by asphalt or concrete building slabs such that the chemical migration via leaching pathway is not a relevant migration pathway.

5.5 Groundwater Transport

Groundwater transport is the advective flow of contaminants with groundwater. Advective flow velocities are based on the properties of the aquifer materials and the hydraulic gradient causing flow. Most contaminants are introduced to the subsurface by percolation through soils; however, based on the lack of elevated concentrations of PCE in shallow unsaturated soils, it is reasonable to assume that PCE was released to the subsurface below the water table via sanitary sewer drains. Any PCE that is adsorbed to soil particles will slowly dissolve into the groundwater and disperse longitudinal and laterally to the hydraulic gradient.

As illustrated by Figure 4, groundwater underlying the Site flows in a northeast direction through the central portion of the Site with a northerly flow direction from the area of MW-2 and MW-14 toward MW-5 at the north (downgradient) area of the Site. Calculated hydraulic conductivities at upgradient wells MW-4 is 6.8 x 10^{-6} ft/sec and MW-9 is 4.2 x 10^{-6} ft/sec. The hydraulic gradient was calculated as 0.015 feet/foot between MW-12 and MW-5 using the groundwater elevations measured on May 4, 2020.

Transport of VOCs via groundwater migration is a relevant potential migration pathway on-site. However, COCs were not detected in off-site groundwater monitoring wells; therefore, transport via groundwater migration is not a relevant migration pathway off-site. Since the Site and surrounding areas are serviced by municipal (supplied) water, any COCs present in Site groundwater would not reach receptors at significant exposure point concentrations. Furthermore, remediation will improve overall groundwater quality over time.

5.6 Exposure Pathways

Based on the analysis of chemical fate and transport provided above, the pathways through which Site COCs could potentially migrate to other areas or media are fugitive dust emissions via physical disturbance of soil particles during remediation and on-site groundwater transport through advection and dispersion.

However, it is unlikely that on-site or off-site receptors would be exposed to any site-related COCs provided remedial actions include treatment/remediation of groundwater contamination along with an SMP and Environmental Easement restricting potable use of groundwater, and NYSDEC and NYSDOH requirements for dust controls during future intrusive activities.

6.0 QUALITATIVE RISK ASSESSMENT

6.1 Human Health Exposure Assessment

A qualitative exposure assessment consists of characterizing the exposure setting (including the physical environment and potentially exposed human populations), identifying exposure pathways, and evaluating contaminant fate and transport.

An exposure pathway describes how an individual may be exposed to contaminants originating from a site. An exposure pathway has the following five elements:

- Receptor population
- Contaminant source
- Contaminant release and transport mechanism
- Point of exposure
- Route of exposure

An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented but could reasonably occur. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway does not exist in the present and will not exist in the future.

6.1.1 Receptor Population

The receptor population includes the people who are or may be exposed to contaminants at a point of exposure. The identification of potential human receptors is based on the characteristics of the Site, the surrounding land uses, and the probable future land uses. Under current Site use conditions, receptors would include indoor workers/customers/ vendors of the shopping plaza; construction workers that may access the Site to complete remedial activities and service utilities; and environmental personnel on-site for sampling Site media and performing remedial work. Plaza customers would include adolescents and adults, whereas indoor workers, vendors, construction workers and environmental personnel would be limited to adults.

The reasonably anticipated future use of the Site is for continued commercial purposes consistent with surrounding property use and Site zoning. Exposed receptors under the future

use scenario would be comprised of indoor workers, outdoor workers (e.g., groundskeepers or maintenance staff), and construction workers who may be employed at or perform work on the property. Site visitors/customers/vendors are also considered receptors; however, their exposure would be like that of the indoor worker but at a lesser frequency and duration. Therefore, consideration of the indoor worker is conservatively protective of the Site visitor/ customer/vendor.

6.1.2 Contaminant Sources

The source of contamination is defined as either the source of contaminant release to the environment (such as a waste disposal area or point of discharge) or the impacted environmental medium (soil, air, biota, water) at the point of exposure. Section 4.0 discusses the contaminants present in unremediated Site media at elevated concentrations. In general, these are limited to cVOCs in subsurface soil/fill, soil vapor, and groundwater, and one instance of nickel in surface soil.

6.1.3 Contaminant Release and Transport Mechanisms

Contaminant release and transport mechanisms carry contaminants from the source to points where people may be exposed and are specific to the type of contaminant and site use. For non-volatile COCs present in Site soil/fill, contaminant release and transport mechanisms will generally be limited to fugitive dust migration and direct contact during future planned intrusive work/remedial activities since the Site is currently covered by vegetation. For the volatile COCs the potential exists for exposure through pathways associated with soil gas migration. This would include both the outdoor pathway (primarily to construction workers involved in subsurface activities where volatiles are present at elevated concentration) as well as the indoor vapor intrusion pathway, also referred to as soil vapor intrusion. Due to the presence of VOCs detected in Site soil/fill and groundwater above cleanup criteria, soil vapor intrusion is a transport mechanism of concern for the Site.

6.1.4 Point of Exposure

The point of exposure is a location where actual or potential human contact with a contaminated medium may occur. Based on exceedances of SCOs in soil/fill, the point of exposure is defined as those areas that will remain after planned remedial activities. The one

exceedance of nickel in surface soil sample S-2 is currently beneath the vegetated soil so exposure would only occur during intrusive activities. cVOCs present in subsurface soil/fill are beneath a building or asphalt pavement so exposure would only occur during intrusive activities and concentrations will be reduced with remediation.

For both the current and future use scenarios, groundwater is not considered a relevant mechanism for exposure for the Site and most of the surrounding areas due to the availability of a local municipal potable water source, depth to groundwater, and the requirement for an Environmental Easement that will restrict the use of Site groundwater.

Soil vapor concerns have been and will continue to be mitigated by a SSDS installed within the building.

6.1.5 Route of Exposure

The route of exposure is how a contaminant enters or contacts the body (i.e., ingestion, inhalation, dermal absorption). Based on the types of receptors and points of exposure identified above, potential routes of exposure are listed below:

Current Use Scenario

- Indoor Worker/Customer/Vendor – inhalation
- Environmental Personnel, Construction and Outdoor Workers (short-term) – skin contact, inhalation, and incidental ingestion

Future Use Scenario

- Indoor Worker/Customer/Vendor – inhalation
- Construction and Outdoor Workers (short-term) – skin contact, inhalation, and incidental ingestion

6.1.6 Exposure Assessment Summary

Based on the above assessment, the potential exposure pathways for the current and future use conditions are listed below.

Current Use Scenario

- Indoor Worker/Customer/Vendor – inhalation of volatile organics present in impacted soil/fill and groundwater during intrusive remedial activities.

- Construction Worker/Environmental Personnel – direct contact, incidental ingestion, and inhalation of volatile organics present in impacted soil/fill and groundwater during intrusive activities.

Future Use Scenario

- Indoor Worker/Customer/Vendor – none
- Construction and Outdoor Worker – direct contact, incidental ingestion, and inhalation of non-volatile COCs present in site-wide soil/fill, and inhalation of volatile (weathered) organics present in impacted soil/fill during intrusive activities.

In most instances, these exposures can be readily mitigated through the use of PPE, proper soil/fill management during intrusive activities, and implementation of an SMP that includes institutional controls (e.g., deed restrictions) and engineering controls such as an SSDS and cover systems (e.g., asphalt, buildings, and/or vegetated soil cover).

6.2 Fish and Wildlife Impact Assessment (FWIA)

The historical use of the Site has eliminated native species. Most of the Site is covered by asphalt paving or concrete structures, with vegetation covering a small portion of the southwestern corner of the Site. There are no important plant habitats or endangered species identified for the area encompassing the Site.

The Site will remain a commercial retail plaza with driveways, parking lots, and commercial buildings, which will substantially limit availability of suitable cover type for reestablishment of biota. Based on the Fish and Wildlife Resource Impact Analysis Decision Key included as Appendix G (NYSDEC DER-10 Appendix 3C; Ref. 7), a fish and wildlife resources impact analysis is not warranted.

6.3 Qualitative Off-Site Exposure Assessment

During the RI, soil borings were advanced and monitoring wells and soil vapor points were installed across the Site, including locations proximate to Site property boundaries. These sampling locations were used in conjunction with previously collected data to complete this qualitative off-site exposure assessment and evaluate potential remedial measures to address Site contamination. The following evaluates the potential for off-site impacts:

Western Boundary of Site:

Soil/fill and groundwater impacts were not observed along this property boundary as it is upgradient of the presumed groundwater source area. Soil vapor could not be collected due to an apparent perched water condition; however, soil vapor concentrations across the Site were low and are associated with soil/fill and/or groundwater impacted by VOCs.

Southern Boundary of Site:

An SSDS is operating within the southern portion of the TOPS building mitigating off-site migration of soil vapor. The highest PCE concentrations were detected in groundwater along the southern property boundary. Impacts are present off-site in wells to the south; however, concentrations are an order of magnitude lower and groundwater flows in a northeasterly direction. PCE was detected in subsurface soil/fill and groundwater in the off-site building to the south; however, concentrations were significantly lower than on-site due to the direction of groundwater flow. Remediation of the groundwater plume both on-site and off-site will further mitigate off-site exposure. One nickel concentration exceeded the CSCO along the southwestern property boundary; however, the sample was collected from beneath the vegetated soil cover and nickel is relatively immobile in soil. In addition, groundwater flows in a northly to northeasterly direction.

Eastern Boundary of Site:

Since PCE was not detected in off-site downgradient wells, it is likely that the groundwater plume is being cut off by the utility sewer bedding along Foote Avenue; however, future off-site migration would be controlled with a proposed permeable reactive barrier (PRB) wall to be installed along the northern section of the eastern property boundary. The soil vapor concentrations along the eastern property boundary and on the east side of Foote Avenue did not exceed NYSDOH air guideline values.

Northern Boundary of Site:

PCE was detected in well MW-5 at a concentration above the GWQS; however, no VOCs were detected in off-site downgradient wells indicating that the plume does not extend off-site, is narrow, and is likely cut-off by the utility bedding along Foote Avenue and Cole Avenue. The soil vapor concentration along the northern property boundary and on the north side of Cole Avenue did not exceed NYSDOH air guideline values. One barium concentration exceeded the CSCO along the northern property boundary; however, the sample was collected from beneath the asphalt at a depth of 12-14 fbgs and barium is relatively immobile in soil.

7.0 REMEDIAL ALTERNATIVES EVALUATION

Section 7 summarizes the criteria used for evaluating remedial alternatives in general and applies them to three specific alternatives considered for the Site: a "No Further Action" alternative, a "Track 1 Cleanup" that would involve a large-scale excavation of impacted material, and a "Track 4 Cleanup" that would involve in situ treatment coupled with institutional controls.

7.1 Remedial Action Objectives

The remedial actions for the Southside Plaza Site must satisfy Remedial Action Objectives (RAOs). RAOs are site-specific statements that convey the goals for minimizing substantial risks to public health and the environment. RAOs have been defined for the Site as follows:

Soil/Fill:

RAOs for Public Health Protection

- Prevent inhalation of or exposure to contaminants volatilizing from soil/fill.
- Prevent ingestion/direct contact with contaminated soil/fill.

RAOs for Environmental Protection

- Prevent migration of contaminants that may result in groundwater contamination.

Soil Vapor:

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from soil vapor intrusion into buildings at the Site.

Groundwater:

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding NYSDEC Class GA GWQS/GVs or with evidence of DNAPL or nuisance characteristics.
- Prevent contact with, or inhalation of volatile compounds, from contaminated groundwater.

RAOs for Environmental Protection

- Remove or treat the source of groundwater contamination.
- Prevent further degradation of off-site water quality.

7.2 General Response Actions

General Response Actions (GRAs) are broad classes of actions that are developed to achieve the RAOs and form the foundation for the identification and screening of remedial technologies and alternatives.

The GRAs available to address the RAOs for soil/fill include:

- Institutional controls (e.g., SMP, Environmental Easement)
- Engineering controls (e.g., cover system)
- Treatment (e.g., in-situ or ex-situ)

The GRA available to address the RAO for soil vapor includes:

- Engineering controls (continued operation and monitoring of the SSDS)
- Treatment (e.g., reduction of volatile compounds in the subsurface)

The GRAs available to address the RAOs for groundwater include:

- Monitored natural attenuation
- Institutional controls (e.g., Environmental Easement)
- Engineering controls (e.g., pump-and-treat)
- Treatment (e.g., in-situ or ex-situ)

7.3 Standards, Criteria, and Guidance

According to DER-10 Section 1.3(b)71, standards, criteria, and guidance (SCGs) refers to: "*standards and criteria that are generally applicable, consistently applied, and officially promulgated, that are either directly applicable or not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with, and with consideration being given to guidance determined, after the exercise of scientific and engineering judgment, to be applicable. This term incorporates both the CERCLA concept of 'applicable or relevant and appropriate requirements' (ARARs) and the USEPA's 'to be considered' (TBCs) category of non-enforceable criteria or guidance. For purposes of this Guidance, 'soil SCGs'*

means the soil cleanup objectives and supplemental soil cleanup objectives identified in 6NYCRR 375-6.8 and the Commissioner Policy on Soil Cleanup Guidance (CP-Soil)."

Additional discussions concerning the specific chemical-, action-, and location-specific SCGs that may be applicable, relevant, or appropriate to remedy selection for the Site are presented below. In each case, the identified SCGs are generally limited to regulations or technical guidance in lieu of the environmental laws from which they are authorized, as the laws are typically less prescriptive in nature and inherently considered in the regulatory and guidance evaluations. Table 7 summarizes the SCGs by media that may be applicable or relevant and appropriate to the Site.

7.3.1 Chemical-Specific SCGs

Chemical-specific SCGs are usually health- or risk-based concentrations in environmental media (e.g., air, soil, water), or methodologies that, when applied to site-specific conditions, result in the establishment of concentrations of a chemical that may be found in, or discharged to, the ambient environment. The determination of potential chemical-specific SCGs for a site is based on the nature and extent of contamination; potential migration pathways and release mechanisms for site contaminants; reasonably anticipated future site use; and likelihood that exposure to site contaminants will occur.

Previous sampling events and RI activities included the collection and analysis of surface/near-surface soil, subsurface soil/fill, soil vapor, and groundwater samples. Data from these media were compared to NYSDEC Part 375 CSCOs and PGWSCOs (soil/fill), NYSDOH air guideline values (soil vapor), and NYSDEC Class GA GWQS/GVs and PFAS action levels (groundwater).

7.3.2 Location-Specific SCGs

Location-specific SCGs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are in a specific location. Some examples of these unique locations include floodplains, wetlands, historic places, and sensitive ecosystems or habitats. The location of the site is a fundamental determinant of its impact on public health and the environment.

7.3.3 Action-Specific SCGs

Action-specific SCGs are restrictions placed on treatment or disposal technologies. Examples of action-specific SCGs are effluent discharge limits and hazardous waste manifest requirements.

7.4 Evaluation of Alternatives

In addition to achieving RAOs, NYSDEC's BCP calls for remedy evaluation using the following criteria set forth in DER-10 Technical Guidance for Site Investigation and Remediation (Ref. 7) and 6NYCRR 375-1.8(f):

- **Overall Protectiveness of Public Health and the Environment**. This criterion is an evaluation of the remedy's ability to protect public health and the environment, assessing how risks posed through each existing or potential pathway of exposure are eliminated, reduced, or controlled through removal, treatment, engineering controls, or institutional controls.
- **Compliance with Standards, Criteria, and Guidance (SCGs)**. Compliance with SCGs addresses whether a remedy will meet applicable environmental laws, regulations, standards, and guidance.
- **Long-Term Effectiveness and Permanence**. This criterion evaluates the long-term effectiveness of the remedy after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: (i) the magnitude of the remaining risks (i.e., will there be any significant threats, exposure pathways, or risks to the community and environment from the remaining wastes or treated residuals), (ii) the adequacy of the engineering and institutional controls intended to limit the risk, (iii) the reliability of these controls, and (iv) the ability of the remedy to continue to meet RAOs in the future.
- **Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment**. This criterion evaluates the remedy's ability to reduce the toxicity, mobility, and volume of Site contamination. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the contamination at the Site.
- **Short-Term Impacts and Effectiveness**. This criterion is an evaluation of the potential short-term adverse impacts and risks of the remedy upon the community, the workers, and the environment during construction and/or implementation. This includes a discussion of how the identified adverse impacts and health risks to the community or workers at the Site will be controlled, and the effectiveness of the controls. This criterion also includes a discussion of engineering controls that

will be used to mitigate short-term impacts (i.e., dust control measures), and an estimate of the length of time needed to achieve the remedial objectives.

- **Implementability**. The implementability criterion evaluates the technical and administrative feasibility of implementing the remedy. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.
- **Cost-Effectiveness**. Capital, operation, maintenance, and monitoring costs are estimated for each remedial alternative and presented on a present worth basis. A remedy is cost effective if the costs are proportional to the overall effectiveness.
- **Community Acceptance**. This criterion evaluates the public's comments, concerns, and overall perception of the remedy. Therefore, community acceptance will be evaluated based on comments to be received from the public in response to Fact Sheets and other planned Citizen Participation activities, including a public comment period for the RI/AA Report.

7.5 Anticipated Future Land Use Evaluation

In developing and screening remedial alternatives, NYSDEC's Part 375 regulations require that the reasonableness of the anticipated future land be factored into the evaluation of remedial alternatives. The regulations identify 16 criteria that must be considered. These criteria and the resultant outcome for the Southside Plaza Site are presented below.

1. *Current use and historical and/or recent development patterns:* The Southside Plaza Site and surrounding area was historically used for dry cleaning facilities and gasoline and service stations with other commercial operations. Current surrounding land use is a mixed commercial and residential area in the City of Jamestown. The Site is currently zoned as C-2 Community Commercial and allows for certain commercial uses, which is consistent with the current and anticipated future Site use. **Accordingly, commercial Site use is consistent with historic Site use.**
2. *Applicable zoning laws and maps:* The Site is currently zoned as Commercial-Area Neighborhood Shopping Centers per the City of Jamestown Zoning Law, which allows for certain commercial uses, which is consistent with the current and future Site use. **Use in a commercial capacity is therefore consistent with current zoning.**
3. *Brownfield opportunity areas as designated set forth in GML 970-r:* The Brownfield Opportunity Area (BOA) Program provides municipalities and community-based organizations with assistance to complete revitalization plans and implementation

strategies for areas or communities affected by the presence of brownfield sites, and site assessments for strategic sites. **The subject property lies outside the City of Jamestown Chadakoin River West BOA and the Chadakoin River Central/Eastern BOA.**

4. *Applicable comprehensive community master plans, local waterfront revitalization plans as provided for in EL article 42, or any other applicable land use plan formally adopted by a municipality:* The Site is in the City of Jamestown but lies south of the boundaries of the Jamestown Urban Design Plan (2019) and the Jamestown Local Waterfront Revitalization Plan (2014).
5. *Proximity to real property currently used for residential use, and to urban, commercial, industrial, agricultural, and recreational areas:* The adjacent and surrounding land is used for residential and commercial purposes. Properties adjacent to the Site primarily include residential, commercial, and vacant land. **Maintaining the use of the Site in a commercial capacity is consistent with surrounding property use and permitted zoning.**
6. *Any written and oral comments submitted by members of the public on the proposed use as part of the activities performed pursuant to the citizen participation plan:* **No comments have been received from the public relevant to Site use concerns.**
7. *Environmental justice concerns, which include the extent to which the proposed use may reasonably be expected to cause or increase a disproportionate burden on the community in which the site is located, including low-income minority communities, or to result in a disproportionate concentration of commercial or industrial uses in what has historically been a mixed use or residential community:* **Nearby and adjacent property is actively used in a commercial capacity. Maintaining use of the Site in a commercial capacity does not pose environmental justice issues.**
8. *Federal or State land use designations:* The property is designated Commercial Land Use by the City of Jamestown (Real Property GIS). **Reuse in a restricted (commercial) capacity is consistent with the current land use designation.**
9. *Population growth patterns and projections:* The City of Jamestown encompasses 9.1 square miles and had an estimated population of 29,058 in 2019, a 6.7% decrease from the 2010 Census (population of 31,146). Continued use as a commercial property will not impact the housing market**. Continued use of the Site in a non-residential capacity does not materially affect opportunities for residential growth.**
10. *Accessibility to existing infrastructure:* Access to the Site is from Foote Avenue and Cole Avenue. Utilities (sewer, water, electric) that service adjacent and nearby properties are present along these corridors. Sanitary and storm sewer conveyance systems,

potable water, and gas/electric utilities are present on-site. **Existing infrastructure supports continued use in a commercial capacity**.

11. *Proximity of the site to important cultural resources, including federal or State historic or heritage sites or Native American religious sites*: **No such resources or sites are known to be present on or adjacent to the Site.**

12. *Natural resources, including proximity of the site to important federal, State, or local natural resources, including waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species:* State wetlands are located approximately 1.0 mile east of the Site. The historical use of the Site has eliminated the native species. Most of the Site is covered by asphalt paving or concrete structures, with vegetation covering some small areas. There are no important plant habitats or endangered species identified for the area encompassing the Site. **The continued use in a commercial capacity will not adversely impact nearby natural resources.**

13. *Potential vulnerability of groundwater to contamination that might emanate from the site, including proximity to wellhead protection and groundwater recharge areas and other areas identified by the Department and the State's comprehensive groundwater remediation and protection program established set forth in ECL article 15 title 31:* Potable water service is provided by on- and off-site the City of Jamestown Board of Public Utilities who obtains its municipal water from eight artesian wells in the Cassadaga aquifer (4.3 miles from Site) and four artesian wells in the Conewango aquifer (7.4 miles from Site). The Jamestown aquifers are confined between layers of relatively impermeable materials such as clay and shale. **Impacted groundwater on-site does not pose a drinking water threat since the Site and surrounding areas use municipally provided water. Remedial measures proposed will improve groundwater quality and prevent further migration of contamination on- and off-site.**

14. *Proximity to flood plains:* The Flood Insurance Rate Map (FIRM) for the City of Jamestown indicates that most of the Site is categorized as Zone C, which means it is above the 500-year flood levels (Ref. 8). **As such, cleanup to commercial standards does not pose a threat to surface water.**

15. *Geography and geology:* The Site is within the glaciated Allegheny Plateau, with the primary bedrock type being the Onondaga Formation of the Conneaut group. The Conneaut group is comprised of Upper Devonian-aged shale, sandstone, and siltstone. Site overburden is generally described as gray to brown sandy silt and clayey silt with some gravel, overlying gray weathered shale. Former development cycles of the Site have impacted both the surface and subsurface geology. **Geography and geology are consistent with continued commercial use.**

16. *Current institutional controls applicable to the site:* **No institutional controls currently apply to the Site.**

Based on the above analysis, continued use of the Site in a commercial capacity is consistent with past and current development and zoning on and near the Site, and does not pose additional environmental or public health risk.

7.6 Volume, Nature, and Extent of Contamination

Estimation of the volume, nature, and extent of media that may require remediation to satisfy the RAOs or that needs to be quantified to facilitate evaluation of remedial alternatives is presented in this section. For the unrestricted use scenario, the cleanup goal would involve achieving USCOs and Class GA GWQS/GVs. For the reasonably anticipated future commercial use scenario, the cleanup goal would involve achieving Part 375 CSCOs and/or PGWSCOs. The volume and extent of media requiring cleanup under these scenarios is presented in Sections 7.6.1 and 7.6.2. In all instances, these volume estimates (and associated cost estimates presented later in this AAR) are projected based on data collected and observations made during previous investigations and RI activities.

7.6.1 Comparison to Unrestricted SCOs (Track 1 Cleanup)

Exceedances of the Part 375 USCOs or PGWSCOs were noted during the RI for PCE in seven subsurface soil/fill sample locations, SVOCs (primarily PAHs) in one subsurface soil/fill sample location, certain metals (primarily arsenic, barium, chromium, copper, lead, manganese, and nickel) in surface/subsurface soil/fill, and pesticides (4,4'-DDT) in one surface/near-surface and two subsurface soil/fill sample locations. PFAS compounds were detected at most locations sampled; however, SCOs have not been developed for these compounds. Previous soil/fill sampling for VOC analysis showed one exceedance of the USCO/PGWSCO for PCE in the presumed source area. In addition, cVOCs and select metals were detected at concentrations above GWQS/GVs primarily on the eastern portion of the Site.

No technology other than excavation and off-site disposal could achieve USCOs and GWQS/GVs over this widespread area and to these depths in a reasonable timeframe. Exceedances of the USCOs for PCE were observed between 2 and 16 fbgs; therefore, this alternative will conservatively assume the soil/fill in the parking lot east of the building (approx. 75,000 square feet) would be excavated to 16 fbgs (or to the gray weathered shale confining layer). In addition, the concrete floor in the southern portion of the TOPs building

and the off-site business Salon-1 (total dimensions approx. 50 feet by 100 feet) would need to be removed to excavate the soil/fill beneath. Select areas exceeding USCOs on other areas of the Site would also be excavated to the depths of impact. Excavation dewatering, treatment, and off-site disposal would be required. Thus, the volume of impacted soil/fill requiring remediation under a Track 1 cleanup is approximately 50,000 cubic yards or 80,000 tons (i.e., 47,000 cubic yards in the parking lot and 3,000 cubic yards beneath the buildings). The amount of groundwater and surface water runoff requiring treatment is difficult to quantify but has been estimated at 80,000 gallons. Figure 6 illustrates the areas that would need to be excavated to achieve USCOs.

7.6.2 Comparison to Restricted Use SCOs (Track 4 Cleanup)

The Track 4 cleanup approach for the Site involves in-situ treatment of saturated soil/fill and groundwater in the source area, which is presumed to be beneath the southern portion of TOPS and the off-site adjoining building (Salon-1), as well as along the northeastern boundary of the Site to mitigate off-site migration of COCs. Based on previous investigations and the RI, eight saturated soil/fill samples contained PCE at concentrations above the PGWSCO. As stated in Section 5.5, the data suggest that PCE was likely released to the subsurface below the water table possibly via sanitary sewer drains. As such, the groundwater and associated saturated soil/fill is the focus of this remedial alternative. The two areas to receive in-situ amendments are shown on Figure 7 and described below include:

- Presumed Source Area: The treatment zone will cover an approximate 7,500 square foot area encompassing on-site monitoring wells MW-12 and MW-13 as well as a portion of the neighboring SFAP property to the south (Salon-1) with treatment depths varying over the saturated zone.
- Downgradient Property Boundary: An approximate 300-foot long barrier to minimize continued off-site migration of COCs, with a saturated treatment zone from approximately 6 to 16 fbgs.

Benchmark-TurnKey researched several in-situ groundwater/saturated soil/fill remediation technologies including in-situ chemical oxidation (ISCO); in-situ chemical reduction (ISCR); sorption with biodegradation; and enhanced anaerobic biodegradation/ biostimulation. In addition, both vertical and horizontal injection wells were investigated. One

CSCO exceedance (nickel) in the southwest corner of the Site would need to be excavated or covered by vegetated soil or asphalt to prevent direct contact.

7.7 Alternatives Evaluation

In addition to the evaluation of alternatives to remediate to the likely end use of the Site, NYSDEC regulation and policy calls for evaluation of less restrictive end-use scenario, such as an unrestricted use scenario (considered under 6NYCRR Part 375 to be representative of cleanup to pre-disposal conditions). Per NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, evaluation of a "no action/no further action" alternative is also required to provide a baseline for comparison against other alternatives. The alternatives evaluated below include:

- Alternative 1: No Further Action
- Alternative 2: Unrestricted Use (Track 1) Cleanup
- Alternative 3: Commercial Use (Track 4) Cleanup

7.7.1 Alternative 1 – No Further Action

Under this alternative, the Site would remain in its current state, with no additional remediation or controls in place apart from the operating SSDS that controls soil vapor intrusion beneath the TOPS building.

Overall Protection of Public Health and the Environment – The No Further Action alternative is not protective of public health and the environment, due to the presence of contamination remaining on-site and potentially migrating off-site above SCGs; the absence of engineering controls (e.g., cover system in southwestern portion of the Site); and the absence of institutional controls to prevent more restrictive forms of future site use (e.g., unrestricted, residential, and restricted residential) or groundwater use. Accordingly, no further action is not protective of public health and does not satisfy the RAOs.

Compliance with SCGs – Under the current and reasonably anticipated future use scenario (commercial), the contamination detected in on-site soil/fill and groundwater does not comply with applicable SCGs.

Long-Term Effectiveness and Permanence – The no further action alternative involves no remedial activities, equipment, institutional controls, or facilities subject to maintenance, and provides no long-term effectiveness or permanence toward achieving the RAOs.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment – The no further action alternative does not reduce the toxicity, mobility, or volume of contamination beyond natural degradation/attenuation and, therefore, this alternative is not protective of public health and does not satisfy any of the RAOs.

Short-Term Impacts and Effectiveness – The contamination on-site poses short-term risks to on-site workers and the environment. Therefore, implementation of the no further action alternative does not satisfy the RAOs.

Implementability – No technical or administrative implementability issues are associated with the no further action alternative.

Cost-Effectiveness – There would be no capital or long-term operation, maintenance, or monitoring costs associated with the no further action alternative apart from costs associated with the SSDS.

Community Acceptance – Community acceptance will be evaluated based on comments received from the public in response to Fact Sheets and other planned citizen participation activities, including a public comment period for the RI/AA Report.

7.7.2 Alternative 2 – Unrestricted Use (Track 1) Cleanup

To achieve unrestricted use, the soil/fill must be cleaned up to unrestricted soil SCGs and groundwater must be restored to its classified use. This alternative involves excavation of soil/fill with exceedances of the USCOs, primarily beneath the asphalt parking lot east of the main plaza, and beneath the southern portion of the TOPS building and within the off-site Salon-1 building. The alternative conservatively assumes the soil/fill would be excavated to approximately 16 fbgs (actual depths would be to the gray weathered shale confining layer). The alternative also requires partial building demolition, removal of the concrete floor in the

buildings prior to excavation, off-site disposal of impacted soil/fill (assumed to be non-hazardous), excavation backfilling, and surface restoration (new concrete floors and asphalt). Excavation dewatering, treatment, and off-site disposal would be required.

Overall Protection of Public Health and the Environment – Excavation and off-site disposal of soil/fill with concentrations above USCOs would be protective of public health and the environment, and fully satisfy the RAOs. However, this alternative would permanently use and displace approximately 50,000 cubic yards of valuable landfill airspace, causing ancillary environmental issues due to reduced landfill capacity, and would require excavating, transporting, and placing 50,000 cubic yards of clean material from an off-site borrow source to backfill the excavation, also contributing to significant detrimental off-site environmental issues. In addition, achievement of a Track 1 cleanup is unlikely given Site conditions even with the proposed mass excavation because groundwater concentrations will not reach GWQS/GVs within a reasonable timeframe, if at all.

Compliance with SCGs – Excavation and off-site disposal would need to be performed in accordance with applicable, relevant, and appropriate SCGs including NYSDEC DER-10. Soil excavation activities would necessitate preparation of and adherence to a community air monitoring plan (CAMP) in accordance with Appendices 1A and 1B of DER-10. Following excavation, groundwater sampling would need to confirm reduction in concentrations below GWQS/GVs.

Long-Term Effectiveness and Permanence – This alternative would remove all impacted soil/fill and therefore provide long-term effectiveness and permanence. However, groundwater monitoring would need to confirm reduction of concentrations below GWQS/GVs.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment – Through removal of all impacted soil/fill, this alternative would permanently and significantly reduce the toxicity, mobility, and volume of contamination on the Site. However, since this alternative transfers Site soil/fill from one environment to another, an overall reduction of toxicity and volume would not occur, although mobility of soluble

constituents would be reduced in the commercial landfill with a liner, leachate collection, and a cover system.

Short-Term Impacts and Effectiveness – The principal advantage of a large-scale excavation to achieve USCOs is reliability of effectiveness in the long-term. The short-term adverse impacts and risks to the community, workers, and environment during implementation of this alternative are significant. The entire shopping center, including the essential services supplied by TOPS, would have to be closed for an extended period. Site workers would be at greater risk of injury due to the overall magnitude of the construction project, especially the depth of the excavation and increased use of heavy equipment. Other physical hazards, primarily related to potential accidents from heavy truck traffic, would be expected as the excavation work would require removal of approximately 3,600 truckloads of soil/fill and import of a similar number of clean loads from the borrow source. Dust control methods would be required to limit the release of particulates during placement of the backfill soils; however, substantial disruption of the neighboring community would occur due to material transport and deliveries and noise from heavy equipment used to construct the remedy. This action would result in storm water impacts at the borrow source(s) and on-site; diesel fuel consumption on the order of 9,000 gallons (assuming 20 miles round trip to the Chautauqua County landfill; 8 miles per gallon), with thousands of gallons also consumed by excavation and grading equipment. The USEPA's estimated CO_2 generation rate for diesel engines is approximately 22.2 pounds per gallon of diesel consumed. Accordingly, this alternative would produce over 200,000 pounds of greenhouse gas.

This alternative represents a significant adverse effect in the short-term; however, the soil/fill RAOs would be achieved once the soil/fill is removed from the Site and backfill soils are in place. The effectiveness of excavation on groundwater concentrations would need to be confirmed through water quality monitoring.

Implementability – Significant technical and administrative implementability issues would be encountered in construction of this unrestricted use alternative. The entire shopping center and possibly some or all the neighboring SFAP would have to close for an extended period, disrupting the availability of essential services in the form of the grocery store. Technical implementability issues may include, but are not limited to, shoring/stabilizing

excavation sidewalls to prevent sloughing during excavation; the need for construction, maintenance, and operation of dewatering facilities; groundwater and/or storm water handling, treatment, and off-site disposal; and traffic coordination for trucks entering and exiting the Site. In addition, deep excavation of native material may result in geotechnical and safety issues relating to structural integrity of the building foundation. Administrative implementability issues may include the need to coordinate and secure disposal contracts with numerous permitted off-site landfills, as no single location would be able to accept the volume of soil/fill generated under this alternative; and difficulty locating local borrow sources for such a large volume of backfill.

Cost – The capital cost for implementation of Alternative 2 is estimated at $9.4 million, factoring in a 35% engineering contingency of capital costs. Table 8 presents a breakdown of the costs.

Community Acceptance – Community acceptance will be evaluated based on comments received from the public in response to Fact Sheets and other planned citizen participation activities.

7.7.3 Alternative 3 – Commercial Use (Track 4) Cleanup

The Track 4 clean up approach would consist of in-situ injections to remediate saturated soil/fill and groundwater contaminated by cVOCs (primarily PCE) within the presumed source area and along the downgradient property boundary. In addition, a cover system would be placed over the southwestern corner of the Site. Alternative 3 would require institutional controls (e.g., groundwater and land use restrictions through an Environmental Easement and SMP) and engineering controls (e.g., possible continued operation of the SSDS and maintenance of cover systems) as components of the final remedy to reduce future potential exposure to impacted soil/fill and groundwater.

Overall Protection of Public Health and the Environment – This alternative meets the NYSDEC requirements for a Track 4 cleanup under the BCP regulations and is protective of public health and the environment. The RAOs for the Site would be satisfied through the planned extent of remedial activities and the use of institutional and engineering controls to

prevent potential future exposure and limit the future use to commercial purposes. Groundwater quality will be monitored over time in accordance with the SMP and is expected to improve as the amendments continue to degrade the cVOCs. Accordingly, the Commercial (Track 4) Use Cleanup alternative is protective of public health and fully satisfies the RAOs.

Compliance with SCGs – The planned remedial activities would be performed in accordance with applicable, relevant, and appropriate SCGs including NYSDEC DER-10. Imported cover material would need to meet backfill quality criteria per DER-10 and 6NYCRR Part 375.

Long-Term Effectiveness and Permanence – Construction of a cover system will prevent direct contact with surface soil exceeding CSCOs. Periodic inspection and maintenance of the existing and new cover systems will be required to assure long-term cover integrity. Continued operation of the SSDS within the TOPS building will mitigate on-site vapor intrusion concerns. The SMP will include an O&M Plan to confirm that engineering controls, including the cover systems and SSDS, are operating and being maintained in accordance with the SMP; an Institutional and Engineering Control (IC/EC) Plan that describes the procedures for the implementation and management of all IC/ECs at the Site; a Site Monitoring Plan that describes the measures for evaluating the performance and effectiveness of the groundwater remedy to reduce or mitigate contamination at the Site; an Excavation Work Plan to address any impacted soil/fill encountered during post-remedial intrusive and/or maintenance activities; and a Site-wide inspection program to assure that the IC/ECs placed on the Site have not been altered and remain effective. Furthermore, an Environmental Easement for the Site will be filed with Chautauqua County, which will limit future use of the Site for commercial purposes, restrict groundwater use, and reference the NYSDEC-approved SMP. As such, this alternative will provide long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment – In-situ treatment of saturated soil/fill and groundwater will reduce the toxicity, mobility, and volume of contamination on and potentially leaving the Site. Placement of a

cover system over the southwestern corner of the Site will prevent direct contact with the elevated nickel concentration. Accordingly, this alternative satisfies this criterion.

Short-Term Impacts and Effectiveness – During intrusive activities, air monitoring would be performed to assure conformance with community air monitoring action levels. The potential for chemical exposures and physical injuries would be reduced through safe work practices; proper PPE; environmental monitoring; establishment of work zones and Site control; and appropriate decontamination procedures. Remedial activities will be performed in accordance with an approved Remedial Action Work Plan (RAWP), including health and safety plan (HASP), CAMP, and soil erosion measures. These controls will be in place during cover system placement. This alternative achieves the RAOs for the Site.

Implementability – No technical or administrative implementability issues are anticipated with the Commercial Use (Track 4) Cleanup alternative. The required USEPA Underground Injection Control (UIC) Permit for installation and use of injection wells is readily obtained. Remedial tasks will include injection of a groundwater treatment amendment using equipment and techniques that have been used for over 30 years.

Cost – The capital cost of implementing Alternative 3 is estimated at $600,000, factoring in a 35% contingency. This includes installation of horizontal injection wells to access areas beneath TOPS without significant interruption of store operations; deployment of amendments; off-site disposal of soil cuttings and development water; construction of a vegetated soil cover system in the southwestern corner of the Site; groundwater performance monitoring; and development of the Final Engineering Report (FER) and SMP. Total OM&M costs for cover system maintenance, groundwater monitoring, and annual certifications/reporting are estimated at $142,000 over a 10-year period. Therefore, the 10-year cost to implement Alternative 3 is estimated at $742,000, including contingencies. Table 9 provides a breakdown of the capital and O&M costs.

Community Acceptance – Community acceptance will be evaluated based on comments received from the public in response to Fact Sheets and other planned citizen participation activities.

7.8 Comparison of Remedial Alternatives

The previous sections describe remedial alternatives for the Southside Plaza Site and evaluate these alternatives against the screening criteria. Table 10 provides a comparison of the alternatives to identify the remedial measure that will best achieve the RAOs for the Site. Based on the foregoing, Alternative 1 (No Further Action) is the least costly, but unacceptable as the RAOs for the Site are not met. Alternative 2 (Track 1 Cleanup) is the most protective of public health and the environment but is cost prohibitive with risks to construction workers. Alternative 3 (Track 4 Cleanup) meets the RAOs for the Site at a reasonable cost.

7.9 Recommended Remedial Alternative

Based on the alternative analysis, *Alternative 3 – Commercial Use (Track 4) Cleanup* is the recommended final remedial approach for the Southside Plaza Site. This alternative is fully protective of public health and the environment, significantly less disruptive to the community, consistent with current and future land use, and represents a more cost-effective approach than Alternative 2 while fully satisfying the RAOs. The recommended remedial alternative would involve:

- Installing horizontal injection wells in the presumed source area and vertical injection wells along the downgradient property boundary followed by in-situ injection of an amendment to remediate cVOCs in the saturated soil/fill and groundwater. Amendment would also be added directly to existing source area wells. Remediation will be accomplished through enhanced in-situ anaerobic bioremediation together with ISCR. The amendment is expected to biodegrade cVOCs for up to four years. The horizontal wells will allow future focused injections should it be necessary to re-inject in the future (e.g., switch to aerobic remediation to destroy vinyl chloride). Although the use of horizontal wells has been assumed for evaluating the remedial alternative because its implementability is certain, less expensive delivery alternatives will be examined as part of the design process.
- Placing a cover system over the southwestern corner of the Site to prevent direct contact with an elevated nickel concentration in surface soil.
- Engineering Controls:
  - Operating and maintaining the existing SSDS.
  - Maintaining existing impervious cover systems including existing building foundations, asphalt parking lots, and concrete sidewalks.

  - Placing a demarcation layer/cover system in the southwestern portion of the Site consisting of vegetated soil a minimum of 1-foot thick or impervious materials such as asphalt or concrete.

- Institutional Controls:
  - Implementing an SMP including an Environmental Easement (groundwater and Site use limitations), IC/EC Plan, and Site Monitoring Plan (including post-injection groundwater quality and performance sampling).

The remedial measures will be described in an RAWP and submitted to NYSDEC for approval. The completed remedial activities will be documented in a FER (see Section 8.1).

8.0 POST-REMEDIAL REQUIREMENTS

8.1 Final Engineering Report

Following completion of the remedial measures, an FER will be submitted to the NYSDEC. The FER will include the following information and documentation, consistent with the NYSDEC regulations contained in 6NYCRR Part 375-1.6(c):

- Background and Site description.
- Summary of the Site remedy that satisfied the RAOs for the Site.
- Certification by a Professional Engineer to satisfy the requirements outlined in 6NYCRR Part 375-1.6(c)(4).
- Description of engineering and institutional controls at the Site.
- Site map showing the areas remediated.
- Documentation of materials disposed off-site.
- Documentation of imported materials.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Analytical data packages and DUSRs.
- CAMP data and reports.
- Photo documentation of remedial activities.
- Text describing the remedial activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that the site activities were carried out in accordance with this Work Plan.

8.2 Site Management Plan

An SMP covering the entire Site will be prepared and submitted concurrent with the FER. The purpose of the SMP is to ensure that proper procedures are in place to provide for long-term protection of public health and the environment after remedial construction is complete. The SMP is comprised of four main components:

- IC/EC Plan

- Site Monitoring Plan
- Operation and Maintenance Plan
- Inspections, Reporting, and Certifications

8.2.1 Institutional and Engineering Control Plan

An institutional control in the form of an Environmental Easement will be necessary to limit future use of the Site to commercial applications and prevent groundwater use for potable purposes.

The IC/EC Plan will include a complete description of all institutional and/or engineering controls employed at the Site, including the mechanisms that will be used to continually implement, maintain, monitor, and enforce such controls. The IC/EC Plan will include:

- A description of all IC/ECs on the site.
- The basic implementation and intended role of each IC/EC.
- A description of the key components of the ICs set forth in the Environmental Easement.
- A description of the features to be evaluated during each required inspection and periodic review, including the IC/EC certification, reporting, and Site monitoring.
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the Site remedy, as determined by the NYSDEC.

8.2.2 Site Monitoring Plan

The Site Monitoring Plan will describe the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, including:

- Sampling and analysis of all appropriate media (e.g., groundwater).
- Assessing compliance with applicable NYSDEC SCGs, particularly ambient groundwater standards and Part 375 SCOs for soil.
- Assessing achievement of the remedial performance criteria.
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Site Monitoring Plan will provide information on:

- Sampling locations, protocol, and frequency.
- Information on all designed monitoring systems (e.g., well logs).
- Analytical sampling program requirements.
- Reporting requirements.
- QA/QC requirements.
- Inspection and maintenance requirements for monitoring wells.
- Monitoring well decommissioning procedures.
- Annual inspection and periodic certification.

The Site Monitoring Plan will also address the need for and frequency of post-remedial groundwater monitoring as well as types of analyses to assess overall reduction in contamination on-site and off-site.

8.2.3 Operation and Maintenance Plan

An Operation & Maintenance (O&M) plan governing maintenance of the SSDS and cover systems will:

- Include the operation and maintenance activities necessary to allow individuals unfamiliar with the Site to maintain the SSDS and cover systems.
- Include an O&M contingency plan.
- Evaluate Site information periodically to confirm that the remedy continues to be effective for the protection of public health and the environment. If necessary, the O&M Plan will be updated to reflect changes in Site conditions or how the SSDS and cover systems are maintained.

8.2.4 Inspections, Reporting, and Certifications

8.2.4.1 Inspections

Site-wide inspection will be conducted annually or as otherwise approved by the NYSDEC. All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format in a Periodic Review Report (PRR).

8.2.4.2 Reporting

The PRR will be submitted to the NYSDEC annually, or as otherwise approved, beginning 18 months after the Certificate of Completion is issued. The PRR will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. The PRR will include:

- Identification, assessment, and certification of all IC/ECs required by the remedy for the Site.
- Results of the required annual Site inspections and severe condition inspections, if applicable.
- All applicable inspection forms and other records generated for the Site during the reporting period in electronic format.
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media, which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format.
- A Site evaluation that includes the following:
  - The compliance of the remedy with the requirements of the site-specific RAWP or Decision Document.
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications.
  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Site Monitoring Plan for the media being monitored.
  - Recommendations regarding any necessary changes to the remedy and/or Site Monitoring Plan.
  - The overall performance and effectiveness of the remedy.

8.2.4.3 Certification

The signed IC/EC Certification will be included in the PRR described in Section 8.2.4.2. For each IC/EC identified for the Site, a Professional Engineer licensed to practice in New York State will certify that the following statements are true:

- The inspection of the Site to confirm the effectiveness of the IC/ECs required by the remedial program was performed under my direction.
- The IC/ECs employed at this Site are unchanged from the date the control was put in place, or last approved by the NYSDEC.
- Nothing has occurred that would impair the ability of the control to protect the public health and environment.
- Nothing has occurred that would constitute a violation or failure to comply with any Site Management Plan for this control.
- Access to the Site will continue to be provided to the NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control.
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document.
- Use of the Site is compliant with the Environmental Easement.
- The engineering control systems are performing as designed and are effective.
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices.
- The information presented in this report is accurate and complete.

8.2.4.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an EC or IC, a Corrective Measures Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Plan until it is approved by the NYSDEC.

9.0 REFERENCES

1. Benchmark Environmental Engineering & Science, PLLC. *Remedial Investigation Work Plan, Southside Plaza Site, Jamestown, New York, BCP Site No. 907043*. November 2019; revised March 2020.

2. New York State Department of Environmental Conservation and NY State Department of Health. *New York State Brownfield Cleanup Development of Soil Cleanup Objectives Technical Support Document*. September 2006.

3. New York State Department of Environmental Conservation. *Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*. June 1998 and Addenda.

4. New York State Department of Environmental Conservations. *DER-13/Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York*. October 2006 and Updates.

5. United States Department of Agriculture (USDA), Soil Conservation Service. *Web Soil Survey of Chautauqua County, New York*. Updated July 31, 2019.

6. U.S. Department of the Interior, Geological Survey, Water Resources Division. Cartwright Robert H. and Ziarno James A. *Chemical Quality of Water from Community Systems in New York, November 1970 to May 1975*. 1980.

7. New York State Department of Environmental Conservation. *DER-10; Technical Guidance for Site Investigation and Remediation*. May 3, 2010.

8. U.S. Department of Housing & Urban Development, Federal Insurance Administration. *Flood Insurance Study*. City of Jamestown, New York, Chautauqua County. December 1977.

TABLES

TABLE 1
SUMMARY OF RI SAMPLING AND ANALYSIS

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Location	Number of Planned Locations	Matrix	Parameter[1]						
			TCL + CP-51 VOCs (+TICs)	TCL SVOCs (+TICs)	TAL Metals[2]	PCBs	Herbicides	Pesticides	1,4-dioxane and PFAS[3]
RI Soil/Fill									
Surface Soil (0-2")	2	Soil/Fill	-	2	2	2	2	2	2
Near Surface Soil (2-12")	2	Soil/Fill	--	2	2	2	2	2	2
Soil Borings	16	Soil/Fill	16	16	16	5	5	5	5
Monitoring Wells	8	Soil/Fill	8	8	8	3	3	3	3
Blind Duplicate[4]	-	Soil/Fill	2	2	2	1	1	1	1
MS[4]	-	Soil/Fill	2	2	2	1	1	1	1
MSD[4]	-	Soil/Fill	2	2	2	1	1	1	1
Soil Subtotal			**30**	**34**	**34**	**15**	**15**	**15**	**15**
RI Soil Vapor[5]									
Soil Vapor	10	Soil Vapor	8	-	-	-	-	-	-
Outdoor Ambient Air	1	Air	1	-	-	-	-	-	-
Soil Vapor Subtotal			**9**	**0**	**0**	**0**	**0**	**0**	**0**
RI Groundwater									
Existing Monitoring Wells	14	Groundwater	14	14	14	7	7	7	7
Shallow Monitoring Wells	7	Groundwater	7	7	7	4	4	4	4
Temporary Monitoring Wells[7]	3	Groundwater	4	-	-	-	-	-	-
Deep Monitoring Wells[8]	3	Groundwater	-	-	-	-	-	-	-
Blind Duplicate[4]	-	Groundwater	2	2	2	1	1	1	1
MS[4]	-	Groundwater	2	2	2	1	1	1	1
MSD[4]	-	Groundwater	2	2	2	1	1	1	1
Trip Blank[8]	-	Water	2	-	-	-	-	-	-
Field Blank	-	Water	2	-	-	-	-	-	1
Groundwater Subtotal			**35**	**27**	**27**	**14**	**14**	**14**	**15**
Sampling Totals			**74**	**61**	**61**	**29**	**29**	**29**	**30**

Notes:

1. Analyses performed via USEPA SW-846 methodology with equivalent Category B deliverables package.
2. Groundwater samples were filtered in the laboratory for dissolved metals analysis.
3. GW analysis includes 1,4-dioxane via Method 8270 SIM and per- and poly-fluoroalkyl substances (PFAS) via Method 537.
4. Blind duplicate and MS/MSD samples collected at a frequency of 1 per 20 samples/media collected.
5. Soil vapor was analyzed for TCL VOCs using USEPA Method TO-15; SV-06 and SV-07 were not analyzed due to water in the boreholes.
6. A fourth temporary groundwater monitoring well was installed off-site.
7. Deep groundwater monitoring wells were not installed due to the presence of the confining layer at the bottom of the shallow overburden well locations.
8. Trip blanks were submitted to the laboratory each day aqueous volatile organic samples are collected.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS AND GROUNDWATER ELEVATIONS

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Location[1]	Date Installed	Well Diameter (in)	Grade Elevation (ft)	Total Depth (fbGrade)	TOR Elevation[2] (ft)	Screened Interval (fbTOR)		Screen Length (ft)	Screened Interval Elevation (ft)		DTW (fbTOR)	Groundwater Elevation (ft)
						Top	Bottom		Top	Bottom	5/4/2020	
On-Site Groundwater Monitoring Wells												
MW-1	5/25/2010	2" PVC	500.42	20.0	500.14	5.0	20.0	15.00	495.42	480.42	7.03	493.11
MW-2	5/25/2010	2" PVC	501.07	16.0	500.77	5.5	16.0	10.50	495.57	485.07	5.09	495.68
MW-3	5/26/2010	2" PVC	501.39	14.0	501.05	4.0	14.0	10.00	497.39	487.39	5.18	495.87
MW-4	5/26/2010	2" PVC	508.13	11.5	508.13	3.5	11.5	8.00	504.63	496.63	5.73	502.40
MW-5	5/26/2010	2" PVC	498.31	20.0	497.75	5.0	20.0	15.00	493.31	478.31	9.28	488.47
MW-6	2/1/2011	2" PVC	500.94	15.7	500.66	5.7	15.7	10.00	495.24	485.24	4.17	496.49
MW-7	2/1/2011	2" PVC	501.89	15.2	501.54	5.2	15.2	10.00	496.69	486.69	5.06	496.48
MW-12	4/15/2015	1" PVC	501.64	11.3	501.51	6.3	11.3	5.00	495.34	490.34	3.43	498.08
MW-13	4/15/2015	1" PVC	501.64	13.5	501.47	8.5	13.5	5.00	493.14	488.14	4.56	496.91
MW-14	4/16/2015	1" PVC	501.64	13.9	501.43	8.9	13.9	5.00	492.74	487.74	5.78	495.65
MW-15	4/16/2020	2" PVC	499.49	13.0	499.14	4.0	13.0	9.00	495.49	486.49	7.09	492.05
MW-16	4/17/2020	2" PVC	499.79	16.0	499.26	6.0	16.0	10.00	493.79	483.79	7.95	491.31
MW-17	4/21/2020	2" PVC	501.33	16.0	501.07	6.0	16.0	10.00	495.33	485.33	7.48	493.59
MW-18	4/20/2020	2" PVC	500.13	16.0	499.62	6.0	16.0	10.00	494.13	484.13	6.34	493.28
MW-19	4/21/2020	2" PVC	500.11	16.0	499.63	6.0	16.0	10.00	494.11	484.11	6.08	493.55
Off-Site Groundwater Monitoring Wells												
MW-8	12/6/2011	2" PVC	501.46	16.3	501.02	6.3	16.3	10.00	495.16	485.16	4.21	496.81
MW-9	12/6/2011	2" PVC	506.12	12.4	505.87	4.4	12.4	8.00	501.72	493.72	4.13	501.74
MW-10A	12/6/2011	2" PVC	503.31	11.8	502.91	6.8	11.8	5.00	496.51	491.51	2.41	500.50
MW-11	12/6/2011	2" PVC	502.65	10.8	502.07	6.8	10.8	4.00	495.85	491.85	3.20	498.87
MW-20	4/21/2020	1" PVC	502.41	13.2	502.21	3.2	13.2	10.00	499.21	489.21	5.18	497.03
MW-21	4/21/2020	1" PVC	502.41	12.0	502.23	4.0	12.0	8.00	498.41	490.41	3.85	498.38

Notes:

1. Wells MW-1 through MW-14 installed by others; re-surveyed 4/30/2020 by Benchmark.
2. Elevations are based off an assumed elevation of 500 feet.
3. Benchmark located on top of SW bolt of light post approx. 20 feet north of MW-5.

Acronyms:

fbTOR = Feet below top of riser

DTW = Depth to water

NM = Not measured

TABLE 3

SUMMARY OF SURFACE/NEAR-SURFACE SOIL ANALYTICAL DATA

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Parameter [1]	USCOs[2] (mg/kg)	CSCOs[2] (mg/kg)	Soil Sample Location and Date				
			S-1 (0-2")	S-2 (0-2")	NS-1 (2-12")	Blind Dup #3 (NS-1)	NS-2 (2-12")
			4/28/20	4/28/20	4/28/20	4/28/20	4/28/20
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg							
Anthracene	**100**	**500**	ND	ND	0.093 J	ND	ND
Atrazine	**--**	**--**	ND	ND	ND	ND	ND
Benzaldehyde	**--**	**--**	ND	ND	ND	ND	ND
Benzo(a)anthracene	**1**	**5.6**	ND	ND	0.2 J	ND	ND
Benzo(a)pyrene	**1**	**1**	ND	ND	0.18 J	0.14 J	ND
Benzo(b)fluoranthene	**1**	**5.6**	ND	ND	0.24 J	0.16 J	ND
Benzo(g,h,i)perylene	**100**	**500**	ND	ND	0.13 J	0.12 J	ND
Benzo(k)fluoranthene	**0.8**	**56**	ND	ND	0.088 J	0.091 J	ND
Cabazole	**--**	**--**	ND	ND	0.045 J	ND	ND
Chrysene	**1**	**56**	ND	ND	0.21 J	0.16 J	ND
Fluoranthene	**100**	**500**	0.19 J	ND	0.44	0.32	2.30 J F1 F2
Fluorene	**30**	**500**	ND	ND	0.056 J	ND	ND
Indeno(1,2,3-cd)pyrene	**0.5**	**5.6**	ND	ND	0.1 J	0.083 J	ND
Naphthalene	**12**	**500**	ND	ND	ND	ND	ND
Phenanthrene	**100**	**500**	ND	ND	0.38	0.18 J	ND
Pyrene	**100**	**500**	ND	ND	0.38	0.25 J	ND
TOTAL SVOCs	**--**	***500***	*0.19*	*0*	*2.5*	*1.5*	*2.3*
SVOC TICs	**--**	**--**	*17*	*200*	*4.9*	*12*	*ND*
TAL Metals - mg/kg							
Aluminum	**--**	**--**	9700	10900	12000	11300	9150 J
Arsenic	**13**	**16**	5.6	9.1	7.4	6.1	6.5
Barium	**350**	**400**	129 ^	118 ^	134 ^	136 ^	91.8 J
Beryllium	**7.2**	**590**	0.41	0.51	0.53	0.5	0.4
Cadmium	**2.5**	**9.3**	0.27 J	0.6	0.22 J	0.33	0.39
Calcium	**--**	**--**	3970	9410	3110	3590	9150 J
Chromium	**30**	**1,500**	12.9	**618**	16.1	15.1	16.0
Cobalt	**--**	**--**	5.3	18.7	7.0	6.6	6.9
Copper	**50**	**270**	18.8	43.8	20.0	20.4	36.7 J
Iron	**--**	**--**	15200	22500	20300	17600	18600
Lead	**63**	**1,000**	26.2	51.5	31.3	30.3	62.8 J
Magnesium	**--**	**--**	2500	4310	3010	2860	3310 J
Manganese	**1,600**	**10,000**	229	579	252	279	406 F2
Nickel	**30**	**310**	15.9	**402**	20.9	19.2	18.5
Potassium	**--**	**--**	1850	1480	1920	1860	1460 J
Sodium	**--**	**--**	73.2 J	55.7 J	59.3 J	59.1	53.9 J
Vanadium	**--**	**--**	17.0	20.7	20.5	19.2	16.5
Zinc	**109**	**10,000**	73.1	**165**	82.2	83.2	106
Mercury	**0.18**	**2.8**	0.024	0.027	0.028	0.024	0.025
Organochlorine Pesticides - mg/kg							
beta-BHC	**0.036**	**3**	ND	ND	ND	0.0018 J	ND
Beta Endosulfan (Endosulfan II)	**2.4**	**200**	0.00059 J	ND	ND	ND	ND
gamma-BHC (Lindane)	**0.1**	**9.2**	ND	ND	ND	ND	ND
4,4'-DDT	**0.0033**	**47**	ND	**0.036 J**	ND	ND	**0.029 J**
Herbicides - mg/kg [3]							
Herbicides were not detected at concentrations above laboratory detection limits							
Polychlorinated Biphenyls (PCBs) mg/kg							
PCB-1248	**0.1**	**1**	0.059 J	ND	ND	ND	ND
Total PCBs	***0.1***	***1***	*0.059 J*	*0*	*0*	*0*	*0*

TABLE 3

SUMMARY OF SURFACE/NEAR-SURFACE SOIL ANALYTICAL DATA

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Parameter [1]	USCOs[2] (mg/kg)	CSCOs[2] (mg/kg)	Soil Sample Location and Date				
			S-1 (0-2")	S-2 (0-2")	NS-1 (2-12")	Blind Dup #3 (NS-1)	NS-2 (2-12")
			4/28/20	4/28/20	4/28/20	4/28/20	4/28/20
Per- and Poly- fluoroalkyl Substances (PFAS) - ug/kg							
Perfluorobutanoic Acid (PFBA)	--	--	ND	ND	ND	ND	0.23 J
Perfluoropentanoic Acid (PFPeA)	--	--	ND	0.23 J B	ND	ND	0.22 J B
Perfluorohexanoic Acid (PFHxA)	--	--	ND	0.12 J	ND	ND	0.12 J
Perfluoroheptanoic Acid (PFHpA)	--	--	0.039 J	0.072 J	0.039 J	0.037 J	0.11 J
Perfluorooctanoic Acid (PFOA)	--	--	0.19 J B	0.3 B	0.27 J B	0.2 J B	0.47 B
Perfluorononanoic Acid (PFNA)	--	--	0.11 J	0.15 J	0.084 J	0.043 J	0.18 J
Perfluorodecanoic Acid (PFDA)	--	--	0.12 J	0.32 I	0.048 J	ND	0.13 J
Perfluoroundecanoic Acid (PFUnA)	--	--	0.11 J	0.16 J	0.056 J	0.038 J	0.065 J
Perfluorododecanoic Acid (PFDoA)	--	--	0.058 J	0.13 J	0.022 J	ND	0.062 J
Perfluorotridecanoic Acid (PFTrDA)	--	--	0.022 J	0.037 J	ND	ND	0.018 J F1
Perfluorotetradecanoic Acid (PFTA)	--	--	0.043 J	0.071 J	ND	ND	0.032 J
Perfluorobutanesulfonic Acid (PFBS)	--	--	0.021 J	0.024 J	0.026 J	0.021 J	0.041 J
Perfluorohexanesulfonic Acid (PFHxS)	--	--	ND	0.16 J B	ND	ND	0.16 J B
Perfluorooctanesulfonic Acid (PFOS)	--	--	1.4	2.5	1.0	0.48	2.4
Perfluorodecanesulfonic Acid (PFDS)	--	--	0.094 J	0.19 J	0.034 J	ND	0.059 J
Perfluorooctanesulfonamide (FOSA)	--	--	ND	0.019 J	ND	ND	0.012 J
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	--	--	ND	0.078 J	ND	ND	ND
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	--	--	0.056 J	0.16 J	ND	ND	0.065 J
TOTAL PFOA + PFOS	--	--	1.6	2.8	1.3	0.68	2.9
TOTAL PFAS	--	--	2.3	4.7	1.6	0.82	4.4

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. NYSDEC Part 375 Unrestricted and Commerical Soil Cleanup Objectives (USCOs and CSCOs).
3. Sample results reported by the laboratory in micograms per kilogram (ug/kg) were converted to milligram per kilogram (mg/kg) for comparison to SCOs.

Definitions:

mg/kg = milligrams per kilogram
ND = Parameter not detected above laboratory detection limit.
NA = Sample not analyzed for parameter.
"--" = No SCO available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J- = Estimated value; the analyte was positively identified; the associated numerical value is an estimated quantity thay may be biased low.
J+ = Estimated value; the analyte was positively identified; the associated numerical value is an estimated quantity thay may be biased high.
B = Compound was found in the blank and sample.
N = Presumptive evidence of analyte; result should be used with caution as a potential false positive and/or elevated quantitative value.
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = MS/MSD RPD exceeds control limits.
I = Value is EMPC (estimated maximum possible concentration)
* = LCS or LCSD exceeds the control limits.
# = Sampled past the respective holding time
^ ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

Result exceeds Unrestricted SCOs
Result exceeds Commercial SCOs

TABLE 4

SUMMARY OF SUBSURFACE SOIL/FILL ANALYTICAL DATA

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Parameter [1]	PGW and USCOs[2] (mg/kg)	CSCOs[3] (mg/kg)	Monitoring Well Sample Locations and Date																												
			SB-15 (12-14')	SB-16 (10-12')	SB-17 (10-12')	SB-18 (0.5-2.0')	SB-18 (6-8')	SB-19 (2-4')	SB-19 (16-18')	SB-20 (8-10')	SB-21 (16-18')	SB-22 (2-4')	SB-22 (6-8')	SB-23 (10-12')	SB-24 (2-4')	SB-25 (12-16')	SB-26 (2-4')	Blind Dup #2 SB-26 (2-4')	SB-27 (4-8')	SB-28 (4-8')	SB-29 (8-11')	SB-30 (12-16')	MW-1D (12-14')	MW-15 (4-6')	MW-16 (14-16')	MW-17 (8-10')	Blind Dup #1 MW-17 (8-10')	MW-18 (14-16')	MW-19 (12-14')	MW-20 (8-12')	MW-21 (8-12')
			4/23/20	4/24/20	4/24/20	4/27/20	4/27/20	4/23/20	4/23/20	4/27/20	4/23/20	4/27/20	4/27/20	4/22/20	4/28/20	4/22/20	4/28/20	4/28/20	4/22/20	4/22/20	4/22/20	4/22/20	4/17/20	4/16/20	4/16/20	4/21/20	4/21/20	4/20/20	4/20/20	4/22/20	4/22/20
TCL Volatile Organic Compounds (VOCs) - mg/kg																															
Acetone	**0.05**	**500**	ND	0.0049 J	0.014 J	NA	0.0065 J	NA	0.0073 J	0.007 J	0.005 J	NA	0.0038 J	0.0035 J	0.0054 J	ND	ND	0.0090 J	0.0045 J	ND	0.0048 J	ND	ND	0.019 J	ND	0.021 J	0.0140 J	ND	0.012 J	0.0082 J	0.0049 J
Chloroform	**0.37**	**350**	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	0.00031 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**0.25**	**500**	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	0.0019 J	ND	ND	ND	ND	ND	0.00058 J	0.0011 J	ND	ND	ND	ND	0.0012 J	ND	ND	ND
Methylene Chloride	**0.05**	**500**	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Napthalene	**12**	**500**	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	0.0013 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	**--**	**--**	ND	0.0004 J	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**1.3**	**150**	ND	ND	ND	NA	ND	NA	0.0014 J	ND	0.011	NA	ND	**6.1 D**	0.00064 J	**8.2 D**	0.098 J	**2.6 J D**	0.067	0.015	**3.7 D**	**2.8 D**	**1.9**	ND	**3.5 D**	ND	ND	0.78	0.10 J	0.079	0.069
trans-1,3-Dichloropropene	**--**	**--**	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**0.47**	**200**	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	0.014	ND	0.006	ND	ND	ND	ND	ND	0.0024 J	0.0062	ND	0.0091	ND	ND	0.0093	0.0017 J	ND	ND
Total VOCs	**--**	**--**	*ND*	*0.0053*	*0.014*	NA	*0.0065*	NA	*0.0087*	*0.0070*	*0.016*	NA	*0.0038*	*6.1*	*0.0060*	*8.2*	*0.10*	*2.6*	*0.072*	*0.015*	*3.7*	*2.8*	*1.9*	*0.019*	*3.51*	*0.021*	*0.014*	*0.79*	*0.11*	*0.087*	*0.074*
VOC TICs	**--**	**--**	*ND*	*ND*	*ND*	NA	*ND*	NA	*ND*	*ND*	*ND*	NA	*ND*	*0.23*	*ND*	*ND*	*0.048*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg																															
Acenaphthene	**20**	**500**	ND	ND	ND	ND	NA	0.22 J	NA	ND	ND	0.82 J	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	**100**	**500**	ND	ND	ND	ND	NA	0.46 J	NA	ND	ND	1.9	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	**1**	**5.6**	0.041 J	ND	ND	0.26 J	NA	0.63 J	NA	ND	ND	**3.3**	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	**1**	**1**	0.045 J	ND	ND	0.43 J	NA	0.66 J	NA	ND	ND	**2.8**	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**1**	**5.6**	0.04 J	ND	ND	0.41 J	NA	0.61 J	NA	ND	ND	**3.2**	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	**100**	**500**	0.037 J	ND	ND	0.39 J	NA	0.4 J	NA	ND	ND	1.8 J	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	0.11 J	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	**0.8**	**56**	ND	ND	ND	ND	NA	0.29 J	NA	ND	ND	**1.7 J**	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	**--**	**--**	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	0.068 J	ND	ND	ND	ND	ND	ND	ND	ND
Cabazole	**--**	**--**	ND	ND	ND	ND	NA	ND	NA	ND	ND	1.2 J	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	**1**	**56**	ND	ND	ND	ND	NA	0.62 J	NA	ND	ND	**3.4**	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	**0.33**	**0.56**	ND	ND	ND	ND	NA	0.21 J	NA	ND	ND	**0.62 J**	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	**7**	**350**	ND	ND	ND	ND	NA	ND	NA	ND	ND	0.46 J	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	**--**	**--**	ND	ND	ND	ND	NA	ND	NA	0.052 J	ND	ND	NA	ND	ND	ND	ND	NA	ND	ND	0.055 J	ND	0.04 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**100**	**500**	0.15 J	ND	ND	0.7 J	NA	1.7	NA	ND	0.022 J	12	NA	ND	ND	ND	0.25 J	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	**30**	**500**	ND	ND	ND	ND	NA	0.15 J	NA	ND	ND	1.1 J	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**0.5**	**5.6**	0.036 J	ND	ND	0.4 J	NA	0.41 J	NA	ND	ND	**1.6 J**	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	**100**	**500**	0.14 J	ND	ND	0.32 J	NA	1.6	NA	ND	ND	11	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	**100**	**500**	0.11 J	ND	ND	0.56 J	NA	1.4	NA	ND	ND	7.8	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL SVOCs	**--**	***500***	*0.60*	*ND*	*ND*	*3.5*	NA	*9.4*	NA	*0.052*	*0.022*	*55*	NA	*ND*	*ND*	*ND*	*0.25*	NA	*ND*	*ND*	*0.055*	*ND*	*0.11*	*0.11*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
SVOC TICs	**--**	**--**	*0.41*	*0.95*	*0.88*	*1.7*	NA	*ND*	NA	*ND*	*0.28*	*3.7*	NA	*0.63*	*0.75*	*0.55*	*ND*	NA	*0.18*	*ND*	*0.38*	*ND*	*4.0*	*ND*	*2.2*	*0.86*	*0.46*	*0.32*	*1.4*	*0.16*	*0.25*
TAL Metals - mg/kg																															
Aluminum	**--**	**--**	14500	8810	13100	14500	NA	17400	NA	9430	13800	12400	NA	11800 B	18000	11100 B	9770	NA	12500 B	10500 B	16700 B	8980 B	11800	16900	13000	10700	11600	12600	9640 F2	12400 B	15100 B
Antimony	**--**	**--**	ND	ND	ND	0.76 J	NA	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	**13**	**16**	12.4	10.3	11.6	4.1	NA	4.9	NA	8.7	12.9	6.7	NA	11.4	11.1	10.7	6.8	NA	7.6	10.7	11.5	**13.2**	9.4	5.5	10.0	**49.3 J**	9.0 J	11.0	6.0	10.1	10.7
Barium	**350**	**400**	**1450**	90.5	167	217 ^	NA	113	NA	163 ^	137	150 ^	NA	**889**	178 ^	141	94.0 ^	NA	151	96.7	166	116	190	145	181	142	157	128	146 J	155	162
Beryllium	**7.2**	**590**	0.67	0.39	0.54	2.3	NA	1.6	NA	0.4	0.73	0.86	NA	0.49	1.0	0.46	0.4	NA	0.5	0.41	0.92	0.4	0.48	1.2	0.62	0.59	0.52	0.64	0.37	0.5	0.78
Cadmium	**2.5**	**9.3**	ND	0.098 J	0.18 J	0.42	NA	0.19 J	NA	0.05 J	0.086 J	0.1 J	NA	0.13 J	ND	0.057 J	0.082 J	NA	0.17 J	0.07 J	0.099 J	0.11 J	0.11 J	0.18 J	0.11 J	0.27	0.27 J	0.051 J	0.084 J	0.15 J	0.0650 J
Calcium	**--**	**--**	46100	62000	19100	58100	NA	15200	NA	1430	15100	24900	NA	35400	1970	22000	20500	NA	2320	23000	11200	25300	18300	17900	8650	25800 J	10800 J	25300	46000 F2	5190	12000
Chromium	**30**	**1,500**	20.0	11.9	16.5	12.7	NA	6.2	NA	12.6	19.4	13.7	NA	12.5	24.7	14.9	13.0	NA	16.1	13.1	21.6	12.2	15.8	22.7	18.5	15.1	16.6	17.9	13.3	16.3	20.6
Cobalt	**--**	**--**	13.5	8.2	8.7	4.8	NA	3.2	NA	6.4	12.7	7.6	NA	9.6	17.0	10.2	8.1	NA	8.8	8.2	15.5	7.2	11.6	9.3	12.9	9.0	9.0	11.8	9.5	9.5	13.6
Copper	**50**	**270**	17.3	19.1	17.9	**51.3**	NA	7.2	NA	17.2	17.8	17.7	NA	20.9	16.2	25.7	15.1	NA	18.2	20.5	17.2	21	16.3	17.1	17.6	19.7	16.0	17.1	11.1	22.2	17.8
Iron	**--**	**--**	27200	17400	20100	11900	NA	9890	NA	18200	28500	17400	NA	19600	31200	22800	18000	NA	19700	20100	28800	19300	26300	19900	27600	32900	20300	25300	24200	21700	26400
Lead	**63**	**1,000**	11.3	16.6	27.6	**199**	NA	25.7	NA	8.8	24	22	NA	34.7	3.5	17.3	8.5	NA	11.7	11.9	9.3	19.5	25	17.8	8.2	15.1	11.0	8.5	7.8	13	10.2
Magnesium	**--**	**--**	5710	20200	6860	12100	NA	3220	NA	2650	6060	6550	NA	15500	5570	5360	7230	NA	3140	4830	6470	4730	4960	8500	5830	12200 J	6530 J	7660	9300	3600	5800
Manganese	**1,600**	**10,000**	1330 B	512 B	565 B	1590	NA	560 B	NA	342	534 B	1140	NA	**3610 B**	314	891 B	351	NA	383 B	330 B	420 B	373 B	710 B	590 B	521 B	424 B	495 B	1290 B	**2150 B**	493 B	466 B
Nickel	**30**	**310**	**30.9**	17.4	20.3	12.4	NA	8.5	NA	17.8	28.2	20.6	NA	21.2	**37.3**	23.3	19.3	NA	22.4	20.7	**31.9**	17.4	27.3	24.5	**30.5**	24.2	23.4	27.2	23.2	23.9	29.5
Potassium	**--**	**--**	2970	1950	2310	1640	NA	1540	NA	1720	2960	2120	NA	2220	3560 J	1690	1790	NA	1860	1750	3590	1610	1920	2030	2210	1840	1820	2690	1760 J	1820	3020
Selenium	**3.9**	**1,500**	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	NA	ND	0.5 J	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	**2**	**1,500**	ND	0.27 J	0.25 J	ND	NA	ND	NA	ND	ND	ND	NA	0.33 J	ND	0.28 J	ND	NA	0.26 J	0.24 J	ND	0.22 J	ND	ND	ND	0.28 J	ND	ND	0.21 J	ND	ND
Sodium	**--**	**--**	157 J	143 J	218	516	NA	9240	NA	164	180	228	NA	215	437	157	109 J	NA	57.9 J	75.9 J	143 J	100 J	230	295	207	747	799 J	220	181	82.6 J	140 J
Vanadium	**--**	**--**	19.4	14.8	25.4	10.2	NA	10.5	NA	17.2	21.6	17.4	NA	18.2	20.7	15.4	16.8	NA	24.5	15.2	25.2	16.3	17.3	31.4	18.6	31.5	28.4	17.1	14.6	19.7	22.4
Zinc	**109**	**10,000**	62.1	37.6	56.1	97.2	NA	59.2	NA	43.1	64.5	50.6	NA	56.1	72.0	49.1	43.4	NA	49	45.9	31.8	47.7	55.4	56.0	59.1	51.6	50.8	49.9	41.2	51.8	60.7
Mercury	**0.18**	**2.8**	0.01 J	ND	ND	0.069	NA	0.016 J	NA	ND	ND	0.014 J	NA	0.0076 J F2	ND	ND	ND	NA	0.011 J	ND	ND	ND	ND	0.027	ND	0.0088 J	0.0084 J	ND	ND	0.0089 J	ND
Organochlorine Pesticides - mg/kg																															
alpha-BHC	**0.02**	**3.4**	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
delta-BHC	**0.04**	**500**	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	0.00053 J	ND	NA	0.00055 J	NA	NA	NA	NA	NA	0.00099 J	NA	NA	ND	NA	NA	0.0005 J
Endrin aldehyde	**--**	**--**	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	0.00067 J	ND	NA	0.00061 J	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
Endrin ketone	**--**	**--**	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	0.00058 J	NA	NA	ND	NA	NA	ND
Methoxychlor	**--**	**--**	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
4,4'-DDE	**0.0033**	**62**	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	0.00062 J	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
4,4'-DDT	**0.0033**	**47**	NA	NA	NA	**0.052 J**	NA	ND	NA	NA	NA	NA	NA	NA	NA	0.00076 J	**0.026 J**	NA	0.00078 J	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	0.0008 J
Herbicides - mg/kg [4]																															
Herbicides were not detected at concentrations above laboratory detection limits																															
Polychlorinated Biphenyls (PCBs) mg/kg																															
PCBs were not detected at concentrations above laboratory detection limits																															

TABLE 4

SUMMARY OF SUBSURFACE SOIL/FILL ANALYTICAL DATA

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Parameter [1]	PGW and USCOs[2] (mg/kg)	CSCOs[3] (mg/kg)	Monitoring Well Sample Locations and Date																												
			SB-15 (12-14')	SB-16 (10-12')	SB-17 (10-12')	SB-18 (0.5-2.0')	SB-18 (6-8')	SB-19 (2-4')	SB-19 (16-18')	SB-20 (8-10')	SB-21 (16-18')	SB-22 (2-4')	SB-22 (6-8')	SB-23 (10-12')	SB-24 (2-4')	SB-25 (12-16')	SB-26 (2-4')	Blind Dup #2 SB-26 (2-4')	SB-27 (4-8')	SB-28 (4-8')	SB-29 (8-11')	SB-30 (12-16')	MW-1D (12-14')	MW-15 (4-6')	MW-16 (14-16')	MW-17 (8-10')	Blind Dup #1 MW-17 (8-10')	MW-18 (14-16')	MW-19 (12-14')	MW-20 (8-12')	MW-21 (8-12')
			4/23/20	4/24/20	4/24/20	4/27/20	4/27/20	4/23/20	4/23/20	4/27/20	4/23/20	4/27/20	4/27/20	4/22/20	4/28/20	4/22/20	4/28/20	4/28/20	4/22/20	4/22/20	4/22/20	4/22/20	4/17/20	4/16/20	4/16/20	4/21/20	4/21/20	4/20/20	4/20/20	4/22/20	4/22/20
Per- and Poly- fluoroalkyl Substances (PFAS) - ug/kg																															
Perfluoropentanoic Acid (PFPeA)	--	--	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
Perfluorooctanoic Acid (PFOA)	--	--	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
Perfluoroundecanoic Acid (PFUnA)	--	--	NA	NA	NA	0.023 J	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
Perfluorobutanesulfonic Acid (PFBS)	--	--	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	0.015 J	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
Perfluorohexanesulfonic Acid (PFHxS)	--	--	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
Perfluorooctanesulfonic Acid (PFOS)	--	--	NA	NA	NA	0.17 J	NA	0.13 J	NA	NA	NA	NA	NA	NA	NA	0.12 J	0.12 J	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	0.17 J
Perfluorooctanesulfonamide (FOSA)	--	--	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	0.011 J
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	--	--	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	0.043 J
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	--	--	NA	NA	NA	0.049 J	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	--	--	NA	NA	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	ND
TOTAL PFOA + PFOS	--	--	*NA*	*NA*	*NA*	*0.17*	*NA*	*0.13*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.12*	*0.12*	NA	*ND*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	*NA*	*NA*	*ND*	*NA*	*NA*	*0.17*
TOTAL PFAS	--	--	*NA*	*NA*	*NA*	*0.24*	*NA*	*0.13*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.12*	*0.14*	NA	*ND*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	*NA*	*NA*	*ND*	*NA*	*NA*	*0.22*

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. NYSDEC Part 375 Protection of Groundwater (PGW) and Unrestricted Soil Cleanup Objectives (USCOs); PGW SCOs are the same as USCOs for the VOC parameters.
3. NYSDEC Part 375 Commercial Soil Cleanup Objectives (CSCOs).
4. Sample results were reported by the laboratory in micograms per kilogram (ug/kg) and converted to milligram per kilogram (mg/kg) for comparison to SCOs.

Definitions:
mg/kg = milligrams per kilogram
ND = Parameter not detected above laboratory detection limit.
NA = Sample not analyzed for parameter.
"--" = No SCO available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J- = Estimated value; the analyte was positively identified; the associated numerical value is an estimated quantity thay may be biased low.
J+ = Estimated value; the analyte was positively identified; the associated numerical value is an estimated quantity thay may be biased high.
B = Compound was found in the blank and sample.
N = Presumptive evidence of analyte; result should be used with caution as a potential false positive and/or elevated quantitative value.
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = MS/MSD RPD exceeds control limits.
* = LCS or LCSD exceeds the control limits.
# = Sampled past the respective holding time
^ ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

Result exceeds USCOs or PGWSCOs
Result exceeds Commercial SCOs

TABLE 5

SUMMARY OF SOIL VAPOR AND OUTDOOR AIR ANALYTICAL DATA

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Parameter [1]	NYSDOH Air Guideline Values (Ambient Air) [2]	Sample Date 4/16/2020								
		On-Site Sample Locations [3]						Off-Site Sample Locations		
		OA	SV-01	SV-02	SV-03	SV-04	SV-05	SV-08	SV-09	SV-10
Volatile Organics Compounds (VOCs) - ug/m3										
1,1,1-Trichloroethane	--	ND	ND	ND	ND	ND	ND	3.4	ND	ND
1,1,2,2-Tetrachloroethane	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	0.41 J	0.39 J	0.52 J	0.52 J	0.47 J	0.58 J	0.59 J	0.68 J	0.52 J
1,2,4-Trimethylbenzene	--	0.12 J	1.1 J	2.0	1.3	1.6	1.9 J	1.0	2.3	2.0 J
1,3,5-Trimethylbenzene	--	ND	0.20 J	0.86 J	0.37 J	0.73 J	0.92 J	0.30 J	0.92 J	1.1 J
1,4-Dioxane	--	0.62 J	ND	ND	ND	ND	ND	ND	3.0 J	ND
Methyl Ethyl Ketone	--	1.1 J	0.61J	3.4	7.3	4.7	5.6 J	3.8	4.2	4.3 J
4-Methyl-2-Pentanone	--	ND	ND	ND	ND	ND	ND	ND	ND	1.9 J
Acetone	--	6.6 J	4.3 J	18	50	26	25 J	22	34	20 J
Benzene	--	0.27 J	0.40 J	19	24	18	17 J	16	31	26 J
Carbon Disulfide	--	0.52 J	0.31 J	4.7	17	14	11 J	12	16	13 J
Carbon Tetrachloride	--	0.27 J	0.30 J	0.21 J	0.32 J	0.26 J	0.18 J	0.34 J	0.56 J	0.31 J
Chlorobenzene	--	ND	ND	ND	0.097	ND	0.081 J	0.083 J	ND	ND
Chloroform	--	ND	ND	0.27 J	1.2	ND	3.0 J	1.0	8.3	0.61 J
Chloromethane	--	0.99 J	0.88 J	0.39 J	1.4	1.8	0.35 J	0.92 J	0.98 J	1.1 J
Cyclohexane	--	ND	0.27 J	12	36	32	22 J	48	65	14 J
Dichlorodifluoromethane	--	1.6 J	1.6 J	1.6 J	1.6 J	1.5 J	1.6 J	3.5	1.8 J	1.6 J
Ethylbenzene	--	ND	0.24 J	20	9.8	48	22 J	6.1	20	26 J
n-Hexane	--	0.22 J	0.45 J	13	21	280 D	8.3 J	17	21	7.5 J
Isopropanol	--	0.89 J	1.9 J	1.5 J	1.4 J	0.85 J	1.3 J	7.2 J	3.2 J	1.1 J
Isopropylbenzene (Cumene)	--	ND	0.098 J	2.8 J	2.2 J	2.3 J	2.9 J	1.7 J	3.4 J	3.5 J
M,P-Xylenes	--	ND	0.82 J	48	19	34	52 J	12	43	61 J
Methylene Chloride	**60**	0.57 J	0.94 J	0.57 J	0.61 J	0.54 J	ND	7.8	ND	ND
O-Xylene (1,2-Dimethylbenzene)	--	0.091 J	0.46 J	17	6.9	11	18 J	4.5	15	20 J
Styrene	--	ND	ND	2.7	2.3	2.4	2.9 J	1.7	2.6	2.8 J
Tetrachloroethylene	**30**	ND	0.30 J	1.3 J	1.6	12	1.5 J	1.0 J	1.6	1.7 J
Tetrahydrofuran	--	ND	ND	1.3 J	0.98 J	ND	1.1 J	ND	2.0 J	0.83 J
Toluene	--	0.36 J	0.65 J	190 D	120	120	180 J D	77	230 D	220 J D
Trans-1,3-Dichloropropene	--	ND	ND	0.94	ND	ND	ND	ND	ND	ND
Trichloroethylene	**2**	ND	ND	0.49 J	0.60 J	ND	1.47 J	0.56 J	0.87 J	0.47 J
Trichlorofluoromethane	--	0.91 J	0.89 J	1.1	1.2	0.82 J	1.2 J	18	1.3	0.97 J

Notes:

1. Only those parameters detected above the method detection limit are presented in this table.
2. Table 3.1 from the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. October 2006; Updates to Table 3.1 for PCE (September 2013) and TCE (August 2015).
3. Soil vapor sampling points SV-06 and SV-07 could not be collected due to water in the borehole.

Definitions:

ND = Parameter not detected above laboratory detection limit
"--" = No value available for the parameter
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
D = Sample results are obtained from a dilution

Result exceeds air guideline value

TABLE 6

SUMMARY OF GROUNDWATER ANALYTICAL DATA

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Parameter [1]	NYSDEC Class GA GWQS[2]	Existing Monitoring Well ID															RI Monitoring Well ID								RI Temporary Well ID			
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10A	MW-11	Blind Dup 1 (MW-11)	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	Blind Dup 2 (MW-19)	MW-20	MW-21	TW-1	TW-2	TW-3	TW-4
		5/6/20	5/6/20	5/7/20	5/4/20	5/5/20	5/6/20	5/5/20	5/6/20	5/5/20	5/5/20	5/5/20	5/5/20	5/7/20	5/7/20	5/7/20	5/5/20	5/6/20	5/5/20	5/7/20	5/6/20	5/6/20	5/4/20	5/5/20	4/21/20	4/21/20	4/21/20	6/5/20
TCL Volatile Organic Compounds (VOCs) - ug/L																												
1,1-Dichloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND<20	ND<20	ND	ND	ND	ND
Acetone	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	**7**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 J	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	**-**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**5**	**24 J**	ND	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.2 J**	3.2	ND	ND	ND
Cyclohexane	**-**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34 J	ND	ND	ND
Methyl tert-butyl ether	**-**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.78 J	ND
Methylcyclohexane	**-**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.21 J	ND	ND	ND	ND	ND	0.43 J	ND	ND	ND
Tetrachloroethene	**5**	**1,400**	**1,900**	**99**	ND	**95**	**1,700 F1**	ND	**18**	ND	ND	4.4	4.3	**3,700**	**76,000**	ND	ND	**2,100**	ND	**25**	**1,700**	**1,800**	**1,100**	**850**	ND	ND	ND	ND
Trichloroethene	**5**	**69**	**68**	**5.4**	ND	**5.6**	**25 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**79**	ND	1.1 J	**40 J**	**45 J**	ND<20	**14**	1.5	ND	ND	ND
Total VOCs	**-**	*1,493*	*1,968*	*106*	*ND*	*101*	*1,725*	*ND*	*18*	*ND*	*ND*	*4.4*	*4.3*	*3,700*	*76,000*	*ND*	*ND*	*2,179*	*33*	*27*	*1,740*	*1,845*	*1,100*	*872*	*5.5*	*ND*	*0.78*	*ND*
VOC TICs	**-**	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
TCL Semi-Volatile Organic Compounds (SVOCs) - ug/L																												
Acetophenone	**-**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1 J	ND	1.3 J	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Benzo(b)fluoranthene	**0.002**	ND	ND	0.51 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Fluoranthene	**50**	ND	ND	0.80 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Phenol	**-**	ND	ND	0.40 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.55 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Pyrene	**50**	ND	ND	0.51 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
TOTAL SVOCs	**-**	*ND*	*ND*	*2.2*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*1.1*	*0.55*	*1.3*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*NA*	*NA*	*NA*	*NA*
SVOC TICs	**-**	*ND*	*ND*	*1.7*	*ND*	*ND*	*ND*	*1.6*	*ND*	*ND*	*5.4*	*134*	*6.4*	*2.7*	*1.7*	*3.9*	*5.1*	*39*	*403*	*3.7*	*3.3*	*3.7*	*ND*	*ND*	*NA*	*NA*	*NA*	*NA*
TAL Metals (Dissolved) - ug/L																												
Barium	**1,000**	230 J	320 J	610 J	92 J	210 J	330 J	61 J	370 J	91 B	650 J	360 J	310 J	250 J	380 J	110 J	230 J	170 J	760 J	190 J	**1200 J**	**1200 J**	290 J	310 J	NA	NA	NA	NA
Calcium	**--**	237000 J	119000 J	129000 J	35400 J	200000 J	97500 J	44500 J	74100 J	26500 J	124000 J	68400 J	58900 J	63800 J	66900 J	47800 J	101000 J	266000 J	161000 J	115000 J	234000 J	239000 J	88700 J	87700 J	NA	NA	NA	NA
Cobalt	**--**	ND	ND	ND	ND	0.86 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4 J	1.7 J	ND	ND	ND	ND	ND	NA	NA	NA	NA
Copper	**200**	ND	ND	ND	ND	1.6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Iron	**300**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31 J	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Lead	**25**	ND	ND	ND	ND	3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Magnesium	**35,000**	**79100 J**	22700 J	33000 J	7300 J	**44300 J**	17800 J	10600 J	15400 J	4700 J	**36000 J**	11500 J	10000 J	10300 J	12900 J	10500 J	14500 J	**67700 J**	30500 J	21400 J	**51500 J**	**53000 J**	16400 J	18300 J	NA	NA	NA	NA
Manganese	**300**	480 J	2300 J	1000 J	ND	1600 J	760 J	9.3 J	4.9 J	ND	62 J	ND	ND	6.3 J	13 J	12 J	24 J	1100 J	1200 J	710 J	1800 J	1800 J	96 J	130 J	NA	NA	NA	NA
Nickel	**100**	ND	1.7 J	ND	ND	3.6 J	ND	ND	ND	ND	ND	ND	ND	ND	1.5 J	ND	1.7 J	2.7 J	2.2 J	1.4 J	ND	ND	ND	3.4 J	NA	NA	NA	NA
Potassium	**--**	4700 J	750 J	3800 J	ND	4900 J	1200 J	ND	1000 J	860 J	2100 J	880 J	710 J	2200 J	1200 J	550 J	2100 J	5600 J	2200 J	7400 J	2800 J	2900 J	1200 J	1900 J	NA	NA	NA	NA
Sodium	**20,000**	**501000 J**	**138000 J**	**367000 J**	10400 J	**362000 J**	**118000 J**	**96500 J**	**32300 J**	17900 J	**71000 J**	**31500 J**	**27300 J**	**57200 J**	**88400 J**	**48700 J**	**46000 J**	**861000 J**	**259000 J**	**599000 J**	**396000 J**	**404000 J**	**79900 J**	**142000 J**	NA	NA	NA	NA
Zinc	**2,000**	4.5 J	5.6 J	3.9 J	ND	ND	6.1 J	ND	4.9 J	ND	ND	ND	ND	2.6 J	4 J	2.9 J	ND	4.4 J	ND	3.1 J	2.2 J	3.4 J	ND	ND	NA	NA	NA	NA
Organochlorine Pesticides - ug/L																												
delta-BHC	**0.04**	NA	NA	ND	ND	ND	0.024 J	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	ND	NA	ND	0.021 J	0.028 J	NA	NA	NA	NA	NA	NA
Heptachlor	**0.04**	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	ND	NA	ND	ND	0.01 J	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	**0.03**	NA	NA	ND	ND	ND	0.012 J	ND	NA	NA	NA	NA	NA	ND	NA	0.011 J	ND	ND	NA	0.0081 J	ND	0.0099 J	NA	NA	NA	NA	NA	NA
4,4'-DDD	**0.30**	NA	NA	ND	ND	ND	0.021 J	ND	NA	NA	NA	NA	NA	ND	NA	0.014 J	ND	ND	NA	ND	0.012 J	ND	NA	NA	NA	NA	NA	NA
4,4'-DDE	**0.20**	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	0.013 J	ND	ND	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
4,4'-DDT	**0.20**	NA	NA	ND	ND	ND	ND	0.014 J+	NA	NA	NA	NA	NA	ND	NA	ND	0.012 J+	ND	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
trans-Chlordane	**--**	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	0.013 J	ND	ND	NA	ND	0.017 J	ND	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls - ug/L																												
PCBs were not detected at concentrations above laboratory detection limits																												
Herbicides - ug/L																												
Herbicides were not detected at concentrations above laboratory detection limits																												
Semi-Volatile Organic Compounds 8270 (SIM) [4] - ug/L																												
1,4 - Dioxane	**0.35**	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	0.15 J	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA

TABLE 6

SUMMARY OF GROUNDWATER ANALYTICAL DATA

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Parameter [1]	NYSDEC Class GA GWQS[2]	Existing Monitoring Well ID															RI Monitoring Well ID								RI Temporary Well ID			
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10A	MW-11	Blind Dup 1 (MW-11)	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	Blind Dup 2 (MW-19)	MW-20	MW-21	TW-1	TW-2	TW-3	TW-4
		5/6/20	5/6/20	5/7/20	5/4/20	5/5/20	5/6/20	5/5/20	5/6/20	5/5/20	5/5/20	5/5/20	5/5/20	5/7/20	5/7/20	5/7/20	5/5/20	5/6/20	5/5/20	5/7/20	5/6/20	5/6/20	5/4/20	5/5/20	4/21/20	4/21/20	4/21/20	6/5/20
Perfluorinated Alkyl Acids - ng/L	Action Level[5]																											
Perfluorobutanoic acid (PFBA)	--	NA	NA	ND	5.1	7.5	3.7 B	6.0	NA	NA	NA	NA	NA	7.0 B	NA	5.8 B	1.6	7.6 B	NA	ND	8.5 B	8.6 B	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	--	NA	NA	7.6 B	1.6	4.9	6.7 B	5.8	NA	NA	NA	NA	NA	22 B	NA	6.9 B	0.84 J	10 B	NA	ND	18 B	17 B	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	--	NA	NA	5.6	1.6	3.2	5.1	2.6	NA	NA	NA	NA	NA	16	NA	4.4	ND	8.4	NA	1.6	13	12	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	--	NA	NA	4.4	0.82 J	1.3 J	3.1	0.98 J	NA	NA	NA	NA	NA	9.1	NA	3.9	ND	4.5	NA	1.1 J	6.3	6.2	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	**10**	NA	NA	6.2	3.7	4.8	8.8	4.9	NA	NA	NA	NA	NA	**22**	NA	**13**	1.6	6.9	NA	2.7	9.5	**10**	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	3.0 B	NA	ND	ND	0.34 JB	NA	NA	NA	NA	NA	NA
Perfluorodecanoic Acid (PFDA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	1.8	NA	ND	ND	5.9	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
Perfluoroundercanoic Acid (PFUnA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	6.4	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
Perfluorododecanoic Acid (PFDoA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	6.8	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
Pefluorotridecanoic Acid (PFTriDA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	5.3 J-	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	8.7	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic Acid (PFBS)	--	NA	NA	3.5	2.9	3.1	2.5	3.5	NA	NA	NA	NA	NA	1.4 J	NA	1.2 J	0.79 J	2.4	NA	2.5	2.4	2.5	NA	NA	NA	NA	NA	NA
Perfluorohexanesukfonic Acid (PFHxS)	--	NA	NA	2.7	2.4	10	1.9	2.3	NA	NA	NA	NA	NA	3.2	NA	3.0	ND	3.6	NA	1.4 J	4.4	4.6	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	0.83 J	NA	0.98 J	ND	1.0 J	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
Perfluorooctanesulfonic Acid (PFOS)	**10**	NA	NA	1.7	4.2 I	5.9 I	4.5	6.7	NA	NA	NA	NA	NA	**84**	NA	**17 I**	1.2 J	8.4	NA	4.2	3.1	3.0	NA	NA	NA	NA	NA	NA
Perfluorosulfonic Acid (PFDS)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	5.6	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	13	NA	ND	ND	ND	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
N-methyl Perfluorooctanesulfonamidoacetic Acid (NMetFOSAA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	6.5 J	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
N-ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	2.5 J	NA	ND	ND	6.0 J	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
1H,1H,2H,2H-Perfluorodecanessulfonic Acid (8:2FTS)	--	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA	ND	ND	4.9 J	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA
PFOA + PFOS[5]	**70**	NA	NA	7.9	7.9	11	ND	12	NA	NA	NA	NA	NA	**106**	NA	30	2.8	15	NA	6.9	13	13	NA	NA	NA	NA	NA	NA
Total PFAS[5]	**500**	NA	NA	32	22	41	ND	33	NA	NA	NA	NA	NA	183	NA	56	6.0	112	NA	14	65	64	NA	NA	NA	NA	NA	NA

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC TOGS 1.1.1 Class GA Groundwater Quality Standards (GWQS); PFOA and PFOS results are compared to the NYSDEC proposed drinking water maximum contaminant level of 10 ng/L for each compound.
3. Tentatively Identified Compounds (TICs).
4. Extraction methodology of Selective Ion Monitoring (SIM) was used for 1,4-dioxane.
5. Per NYSDEC guidance, action levels in groundwater requiring additional monitoring.

Definitions:

ug/L = micrograms per liter; ng/L = nanograms per liter
NA = Parameter not tested.
ND = Parameter not detected above laboratory detection limit.
"--" = No GWQS or action level available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J- = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low.
J+ = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
B = Analyte was detected in the associated blank as well as in the sample.
D = Analyzed at dilution
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = MS/MSD RPD exceeds control limits.
I = Value is EMPC (estimated maximum possible concentration).
* = LCS or LCSD is outside acceptance limits.
^ = Instrument related QC is outside acceptance limits.

Result exceeds NYSDEC Class GA GWQS/GV

TABLE 7
STANDARDS, CRITERIA, AND GUIDANCE

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Citation	Title	Regulatory Agency
General		
29CFR 1910.120	Hazardous Waste Operations and Emergency Response	US Dept. of Labor, OSHA
29CFR 1910.1000	OSHA General Industry Air Contaminants Standard	US Dept. of Labor, OSHA
29CFR 1926	Safety and Health Regulations for Construction	US Dept. of Labor, OSHA
Not Applicable	Analytical Services Protocol	NYSDEC
6NYCRR Part 608	Use and Protection of Waters	NYSDEC
6NYCRR Part 621	Uniform Procedures Regulations	NYSDEC
6NYCRR Parts 750-757	State Pollutant Discharge Elimination System	NYSDEC
Not Applicable	New York State Stormwater Management Design Manual	NYSDEC
Section 404	Clean Water Act	USACE
Soil/Fill		
6NYCRR Part 375	Environmental Remediation Programs	NYSDEC
DEC Policy CP-51	Soil Cleanup Guidance	NYSDEC
Groundwater		
6NYCRR Part 700-705	Surface Water and Ground Water Classification Standards	NYSDEC
TOGS 1.1.1	Ambient Water Quality Standards and Guidance Values	NYSDEC
TOGS 2.1.3	Primary and Principal Aquifer	NYSDEC
Air		
DER-10 Appendix 1B	Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites	NYSDEC
Soil Vapor		
NYSDOH, October 2006	Final-Guidance for Evaluating Soil Vapor Intrusion in the State of NY; updates to Table 3.1 in September 2013 and August 2015	NYSDOH
Solid Waste		
6NYCRR 360	Solid Waste Management Facilities	NYSDEC
6NYCRR 364	Waste Transporters	NYSDEC

TABLE 8
COST ESTIMATE FOR UNRESTRICTED USE (TRACK 1) ALTERNATIVE

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Item	Quantity	Units	Unit Cost	Total Cost	Remarks
Professional Services					
Remedial Action Work Plan	1	LS	$ 15,000	$ 15,000	
Engineering Oversight Fieldwork/CAMP	160	DAYS	$ 1,400	$ 224,000	
Waste Profiles (paperwork, sampling)	2	DAYS	$ 1,400	$ 2,800	
Final Engineering Plan	1	LS	$ 20,000	$ 20,000	
				$ 261,800	
Demolition					
Concrete Floor (TOPS)	2,500	SF	$ 10	$ 25,000	
Concrete Floor (Salon-1)	2,500	SF	$ 10	$ 25,000	
Utilities	200	LF	$ 5	$ 1,000	
SSDS (TOPS Building)	1	LS	$ 5,000	$ 5,000	
Subtotal:				**$ 56,000**	
Impacted Soil/Fill Removal					
Soil/Fill Excavation and Loading	80,000	TON	$ 6	$ 480,000	parking lot, beneath bldgs, discrete locations
Sheetpiling	26,400	SF	$ 25	$ 660,000	
Waste Characterization Analytical	160	EA	$ 250	$ 40,000	1 sample per 500 tons
Transportation and Disposal at Chautauqua County Landfill	80,000	TON	$ 30	$ 2,400,000	1.6 tons per CY
Verification Sampling	172	EA	$ 100	$ 17,200	1 per 30' sidewall; 1 per 900 SF bottom
GW Treatment System O&M	1	LS	$ 87,000	$ 87,000	Est. 160 days excavation/backfill
Subtotal:			.	**$ 3,685,000**	
Backfilling/Site Restoration					
Import, Backfill, Place & Compact	80,000	TON	$ 25	$ 2,000,000	
Geotextile	92,125	SF	$ 1.50	$ 138,188	525'x150'(parking); 100'x50' (buildings)
Replace Concrete Floor (TOPS)	2,500	SF	$ 10	$ 25,000	
Replace Concrete Floor (Salon-1)	2,500	SF	$ 10	$ 25,000	
Replace Asphalt Parking Lot	78,750	SF	$ 5	$ 393,750	
Replace Utility Lines	200	LF	$ 20	$ 4,000	
Backfill Characterization Sampling	105	EA	$ 100	$ 10,500	VOCs
Data Validation	105	EA	$ 25	$ 2,625	
Backfill Characterization Sampling	51	EA	$ 500	$ 25,500	SVOCs, PCBs, Pesticides, Metals
Data Validation	51	EA	$ 80	$ 4,080	
Subtotal:			.	**$ 2,629,000**	
Subtotal Capital Cost				**$ 6,631,800**	
Contractor Mobilization/Demobilization (5%)				$ 331,590	
Health and Safety (2%)				$ 132,636	
Engineering/Contingency (35%)				$ 2,321,130	
Total Capital Cost for Unrestricted Use (Track 1) Alternative				**$ 9,418,000**	

TABLE 9
COST ESTIMATE FOR COMMERCIAL USE (TRACK 4) ALTERNATIVE

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Item	Quantity	Units	Unit Cost	Total Cost	Remarks
Professional Services					
Remedial Action Work Plan	1	LS	$ 15,000	$ 15,000	
Engineering Oversight Fieldwork/CAMP (Source Area)	10	DAYS	$ 1,400	$ 14,000	includes cover system placement oversight
Engineering Oversight Fieldwork/CAMP (Barrier Wall)	5	DAYS	$ 1,400	$ 7,000	includes installation of MW
IDW Characterization (paperwork, sampling)	1	DAY	$ 1,400	$ 1,400	
Groundwater Performance Sampling	4	EVENT	$ 1,200	$ 4,800	semi-annually for 2 years
Final Engineering Plan and Site Management Plan	1	LS	$ 20,000	$ 30,000	
Subtotal:				**$ 73,000**	
VOC-Impacted Groundwater Remediation					
GPR Survey	1	LS	$ 3,000	$ 3,000	locate utilities at entrance/exit
Installation of Horizontal Well Systems	1	EST	$ 120,000	$ 120,000	3 in source area
Source Area Amendment	1	EST	$ 76,000	$ 76,000	product only
Amendment for Existing Source Area Wells	1	LS	$ 6,000	$ 6,000	MW-12, MW-13, MW-20, MW-21
Deployment of Amendment	1	LS	$ 22,000	$ 22,000	est. 5 days
Downgradient Barrier Amendment and Injection	1	EST	$ 97,000	$ 97,000	~300 feet long; 6-16 fbgs; vertical wells
Install Monitoring Well Downgradient of Barrier Wall	1	LS	$ 3,000	$ 3,000	
Groundwater Performance Sampling Analytical	4	EVENT	$ 1,400	$ 5,600	semi-annually for 2 years
Subtotal:				**$ 333,000**	
IDW Characterization and Disposal					
Waste Characterization Analytical	1	EA	$ 250	$ 250	
Transportation & Disposal at TSDF	80	TON	$ 40	$ 3,200	non-hazaradous soil/fill slurry
Subtotal:				**$ 3,450**	
Cover System - Southwest Corner of Site					
Import Cover Soil Characterization	1	Est	$ 3,000	$ 3,000	
Import and Place Cover Soils	178	TON	$ 15	$ 2,667	6,000 SF, 6" thick; 1.6 ton/cy
Import and Place Top Soil	178	TON	$ 30	$ 5,333	
Demarcation Layer	6,000	SF	$ 0.05	$ 300	
Hydroseed/Fertilize/Watering	6,000	SF	$ 0.10	$ 600	
Subtotal:				**$ 12,000**	
Subtotal Capital Cost				**$ 422,000**	
Contractor Mobilization/Demobilization (5%)				$ 21,100	
Health and Safety (2%)				$ 8,440	
Engineering/Contingency (35%)				$ 147,700	
Total Capital Cost				**$ 600,000**	
Operation, Maintenance & Monitoring Costs					
Groundwater Monitoring	15	Events	$ 7,100	$ 106,500	Semi-Annual (5 yrs), Annual (5 yrs)
SSDS/Cover System Maintenance	10	Yr	$ 1,000	$ 10,000	Annual
Annual Certification and PRR	10	Yr	$ 2,500	$ 25,000	Annual, may be reduced to triennially
Total OM&M Cost				**$ 142,000**	
Total 10-Year Cost				**$ 742,000**	

TABLE 10
COMPARISON OF REMEDIAL ALTERNATIVES

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Remedial Alternative	NYSDEC DER-10 Evaluation Criteria								
	1. Overall	2. SCGs	3. Eff & Perm	4. Reduction	5. Imp & Eff	6. Implement	7. Cost Eff	8. Community	9. Land Use
Alternative 1 - No Further Action						✓	$ -	TBE	
Alternative 2 - Track 1 Cleanup	✓	✓	✓				$ 9,418,000	TBE	✓
Alternative 3 - Track 4 Cleanup	✓	✓	✓	✓	✓	✓	$ 742,000	TBE	✓

Notes:

1. Overall Protectiveness of Public Health and the Environment
2. Compliance with Standards, Criteria, and Guidance (SCGs)
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment
5. Short-Term Impacts and Effectiveness
6. Implementability (Technical and Administrative)
7. Cost Effectiveness
8. Community Acceptance
9. Land Use

✓ = Alternative satisfies criterion
TBE = To be evaluated following public comment period

FIGURES

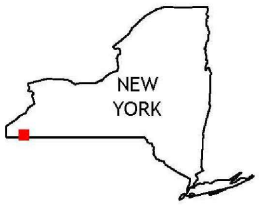
FIGURE 1

BASEMAP: USGS JAMESTOWN 2016 QUADRANGLE

6,000' 0' 6,000' 12,000'

SCALE: 1 INCH = 6000 FEET
SCALE IN FEET
(approximate)

N



BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0505-019-001

DATE: MAY2020

DRAFTED BY: RFL

SITE LOCATION & VICINITY MAP

RI / AA REPORT

SOUTHSIDE PLAZA SITE
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

PREPARED FOR

LB-UBS 2007 - C6 - SOUTHSIDE STATION LLC c/o KAZMAREK MOWREY CLOUD LASETER LLP

BUILDING 1:
1. UPS STORE
2. SPA NAILS
3. DOLLAR TREE
4. CELLULAR ONE
5. KEY BANK
6. TOPS

BUILDING 2:
7. MCDONALDS

100' 0' 100' 200'

SCALE: 1 INCH = 100 FEET
SCALE IN FEET
(approximate)

N

LEGEND:

PROPERTY BOUNDARY

DATE: MAY 2020
DRAFTED BY: RFL

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: 0505-019-001

LB-UBS 2007 - C6 - SOUTHSIDE STATION LLC c/o KAZMAREK MOWREY CLOUD LASETER LLP

SITE PLAN (AERIAL)

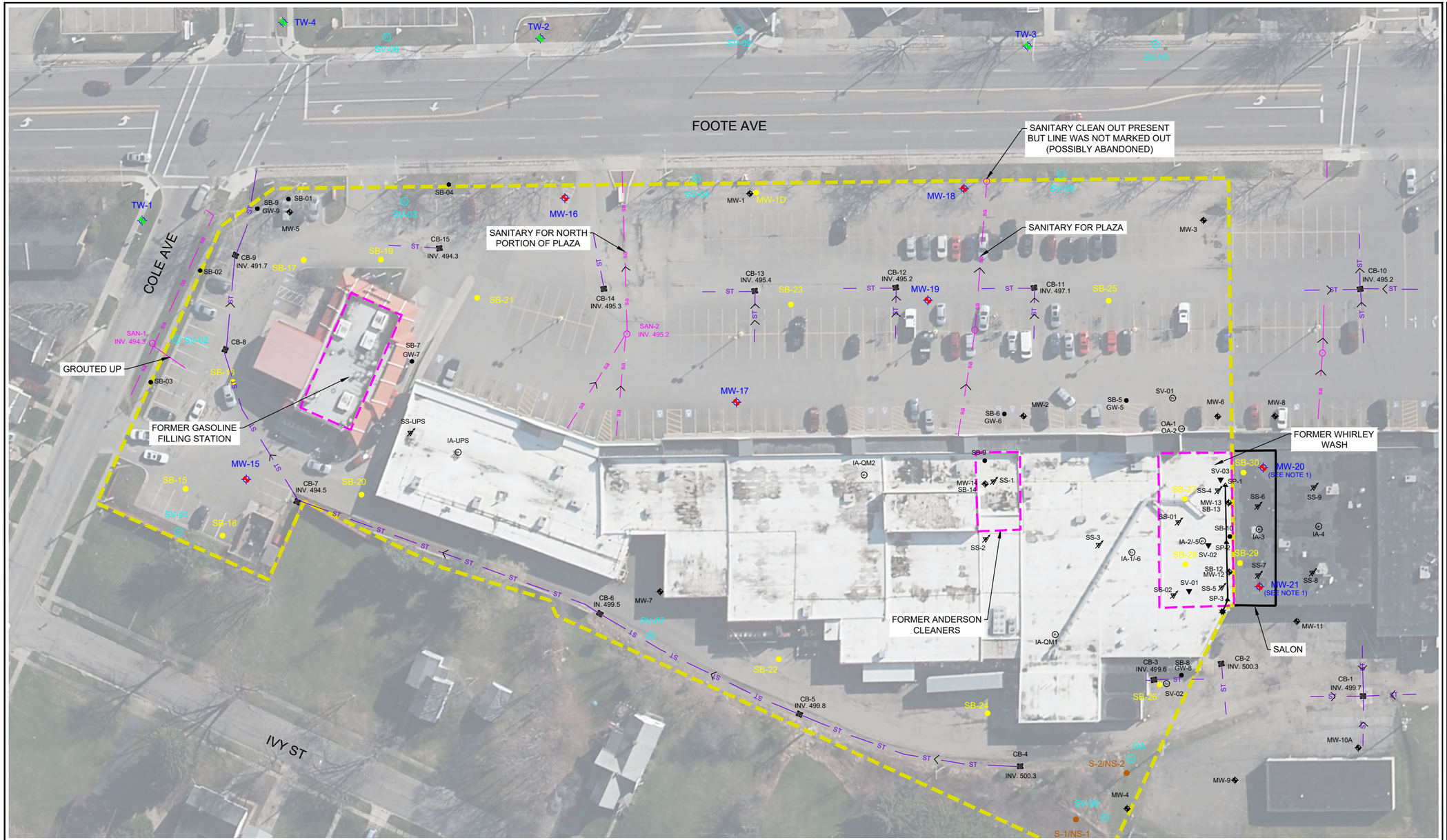
RI / AA REPORT

SOUTHSIDE PLAZA SITE
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

PREPARED FOR

FIGURE 2

F:\CAD\Benchmark\Kazmarek Mowrey Cloud Laseter\Southside Plaza\RI-AA\Figure 2; Site Location.dwg, 6/30/2020 11:46:42 AM, DWG To PDF.pc3



SCALE: 1 INCH = 30 FEET
SCALE IN FEET
(approximate)

LEGEND:

	PROPERTY BOUNDARY APPROXIMATE
	POTENTIAL FORMER CONTAMINANT SOURCE
MW-15	OVERBURDEN WELL (7)
TW-1	TEMPORARY 1" OVERBURDEN WELL (3)
SB-15	SOIL BORING (17)
S-1/NS-1	SOIL SAMPLE LOCATION: S=SURFACE; NS= NEAR SURFACE (2)
SV-04	SOIL VAPOR (10)
CB-14	STORM WATER CATCH BASIN
ST	STORM WATER LINE (APPROXIMATE)
	SANITARY MANHOLE
SAN	SANITARY LINE (APPROXIMATE)

HISTORIC EXPLORATIONS:

SB-1	SOIL BORING (6)
OA-1	OUTDOOR AIR SAMPLE (2)
IA-QM1	INDOOR AIR SAMPLE (9)
SB-6 GW-6	SOIL BORING WITH TEMPORARY MONITORING WELL (5)
SV-01	SOIL VAPOR (2)
SS-1	SUBSLAB VAPOR (12)
SV-03	MAY 2019 SOIL VAPOR MONITORING POINTS (3)
MW-1	MONITORING WELL (14)
SP-1	SUB-SLAB SUCTION PIT
	SUB-SLAB PIPING LOCATION
	SUB-SLAB FAN AND VENT LOCATION

NOTES:
1. MONITORING WELLS PLANNED ON THE INSIDE OF THE BUILDING WERE INSTALLED AS 1-INCH DIAMETER WELLS DUE TO SPACE AND DRILLING EQUIPMENT LIMITATIONS.
2. PROPERTY BOUNDARY ADAPTED FROM A SURVEY PREPARED BY LEHR LAND SURVEYORS DATED MAY 22, 2015.
2. BASE MAP NYS STATE PLANAR PHOTOGRAPHY DATED APRIL 2016.
3. INVESTIGATION LOCATIONS (IF LOCATED AND ACCESSIBLE) WERE SURVEYED DURING THE REMEDIAL INVESTIGATION (RI). LOCATIONS UNABLE TO BE IDENTIFIED DURING THE RI WERE ADAPTED FROM SEVERAL PREVIOUS REPORTS. ALL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE.
4. SP-3 U-TUBE MANOMETER MEASURES VACUUM FOR SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS)
5. CATCH BASIN AND SANITARY SEWER INVERT ELEVATIONS BASED ON DEEPEST INVERT.
6. SOIL VAPOR SV-06 AND SV-07 WERE NOT SAMPLED DUE TO PRESENCE OF WATER

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(716) 856-0599

JOB NO.: 0505-019-001

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

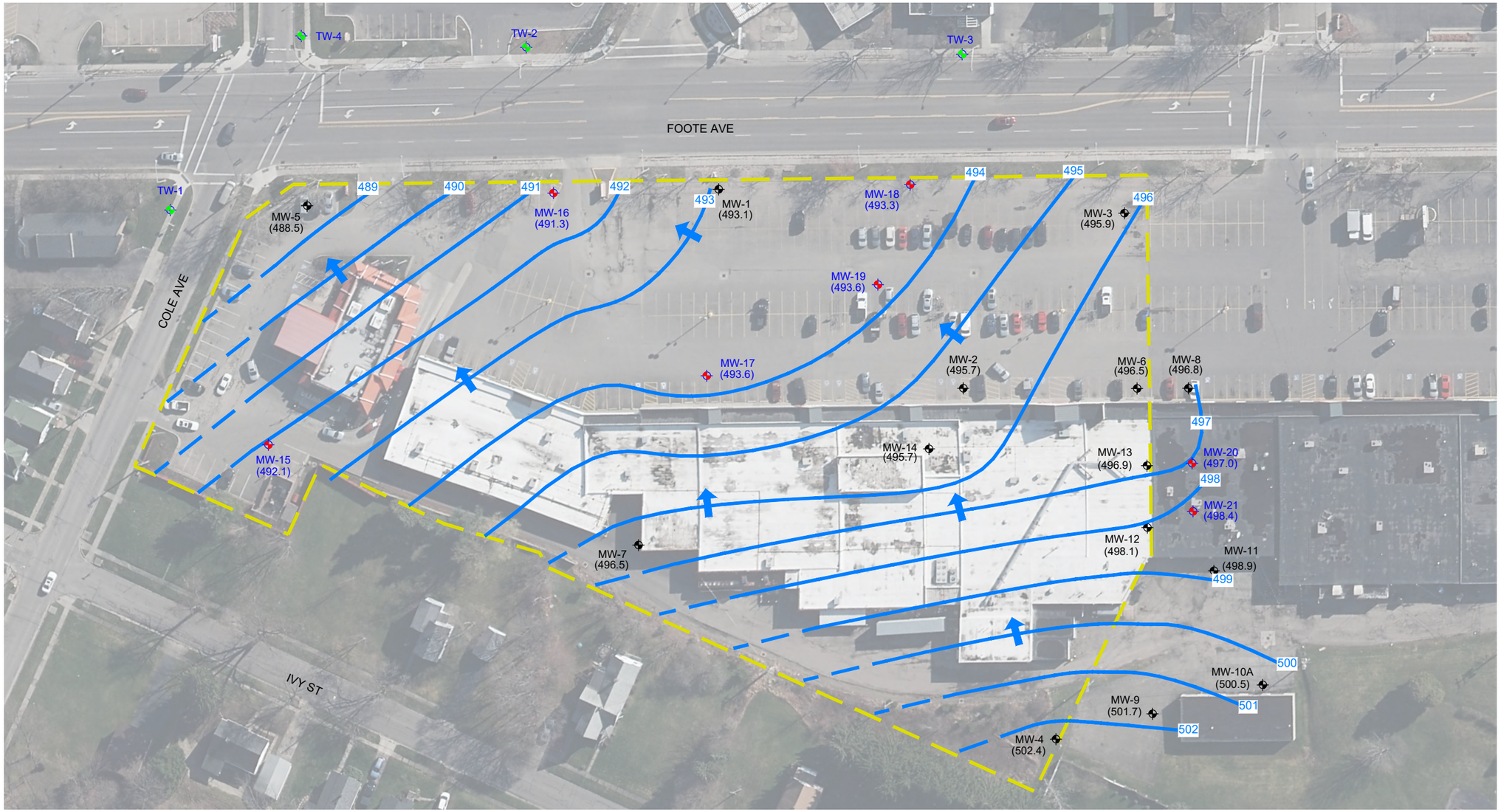
DRAWN BY:	CMC
DATE:	MAY 2020
CHECKED BY:	LR
APPROVED BY:	MAL

REMEDIAL INVESTIGATION LOCATIONS

RI / AA REPORT
SOUTHSIDE PLAZA SITE
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

PREPARED FOR
LB-UBS 2007 - C6 - SOUTHSIDE STATION c/o KAZMAREK MOWREY CLOUD LASETER LLP

FIGURE 3



N

80' 0' 80' 160'

SCALE: 1 INCH = 80 FEET
SCALE IN FEET
(approximate)

LEGEND:

- PROPERTY BOUNDARY APPROXIMATE
- MW-1 (493.11) — HISTORIC MONITORING WELL (14) WITH GROUNDWATER ELEVATION
- MW-15 (492.05) — RI OVERBURDEN WELL (7) WITH GROUNDWATER ELEVATION
- TW-1 — RI TEMPORARY 1" OVERBURDEN WELL (3)
- 1430 — GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. ALL MONITORING WELL DEPTH TO WATER MEASUREMENTS COMPLETED BY BENCHMARK-TURNKEY ON MAY 5, 2020.
2. GROUNDWATER ELEVATIONS MEASURED FROM AN ARBITRARY SITE DATUM OF 500 FEET, LOCATED ON TOP OF SW BOLT OF LIGHT POST APPROXIMATELY 20 FEET NORTH OF MW-5.
3. MONITORING WELLS INSTALLED ON THE INSIDE OF THE BUILDING ARE 1-INCH DIAMETER WELLS.
4. PROPERTY BOUNDARY ADAPTED FROM A SURVEY PREPARED BY LEHR LAND SURVEYORS DATED MAY 22, 2015.
5. BASE MAP NYS STATE PLANAR PHOTOGRAPHY DATED APRIL 2016.

DATE: MAY 2020
DRAFTED BY: CMC

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GROUNDWATER ISOPOTENTIAL MAP (MAY 2020)

RI / AA REPORT

SOUTHSIDE PLAZA SITE
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

PREPARED FOR

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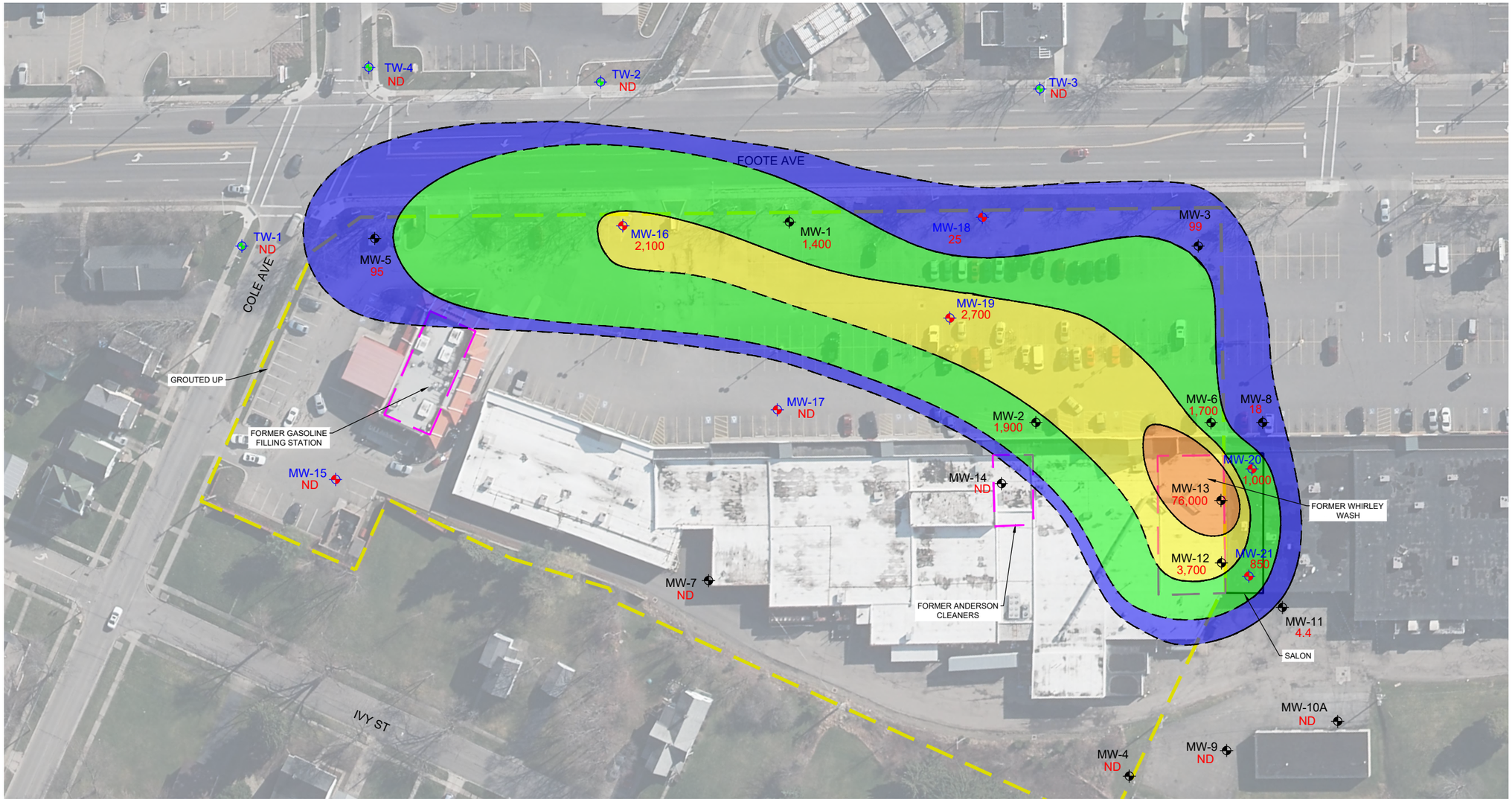
FIGURE 4



N

80' 0' 80' 160'

SCALE: 1 INCH = 80 FEET
SCALE IN FEET
(approximate)

LEGEND:

- PROPERTY BOUNDARY APPROXIMATE
- POTENTIAL FORMER CONTAMINANT SOURCE
- MW-1 HISTORIC MONITORING WELL (14)
- MW-15 RI OVERBURDEN WELL (7)
- TW-1 TEMPORARY 1" OVERBURDEN WELL (3)
- 4.4 TETRACHLOROETHYLENE (PCE) CONCENTRATION (ug/L)
- PCE ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)
- PCE CONCENTRATION OF 5-100 ug/L
- PCE CONCENTRATION OF 101-2,000 ug/L
- PCE CONCENTRATION OF 2,001-5,000 ug/L
- PCE CONCENTRATION OF 5,001-100,000 ug/L

NOTES:

1. MONITORING WELLS INSTALLED ON THE INSIDE OF THE BUILDING ARE 1-INCH DIAMETER WELLS DUE TO SPACE AND DRILLING EQUIPMENT LIMITATIONS.
2. PROPERTY BOUNDARY ADAPTED FROM A SURVEY PREPARED BY LEHR LAND SURVEYORS DATED MAY 22, 2015.
2. BASE MAP NYS STATE PLANAR PHOTOGRAPHY DATED APRIL 2016.
3. INVESTIGATION LOCATIONS (IF LOCATED AND ACCESSIBLE) WERE SURVEYED DURING THE REMEDIAL INVESTIGATION (RI). LOCATIONS UNABLE TO BE IDENTIFIED DURING THE RI WERE ADAPTED FROM SEVERAL PREVIOUS REPORTS. ALL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE.

DATE: JUNE2020
DRAFTED BY: CMC

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PCE ISOCONCENTRATION MAP

RI / AA REPORT

SOUTHSIDE PLAZA SITE
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

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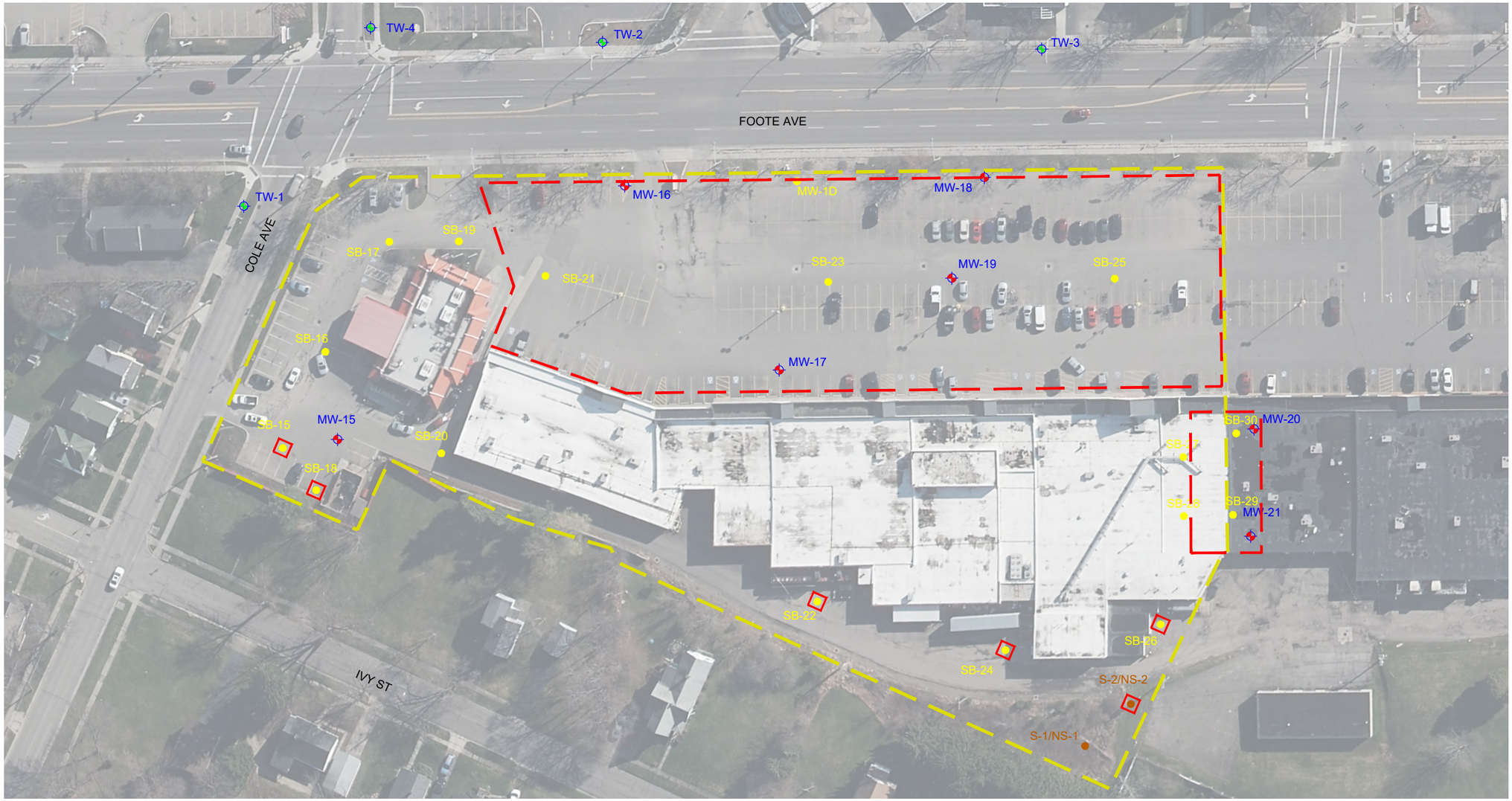
FIGURE 5



N

80' 0' 80' 160'

SCALE: 1 INCH = 80 FEET
SCALE IN FEET
(approximate)

LEGEND:

	PROPERTY BOUNDARY APPROXIMATE
MW-15	OVERBURDEN WELL (7)
TW-1	TEMPORARY 1" OVERBURDEN WELL (3)
SB-15	SOIL BORING (17)
S-1/NS-1	SOIL SAMPLE LOCATION: S=SURFACE; NS= NEAR SURFACE (2)
	APPROXIMATE EXCAVATION AREAS (0-16 FBGS)
	DISCRETE EXCAVATION AREAS

DATE: JUNE2020
DRAFTED BY: CMC

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COMPARISON TO UNRESTRICTED USE SCOs

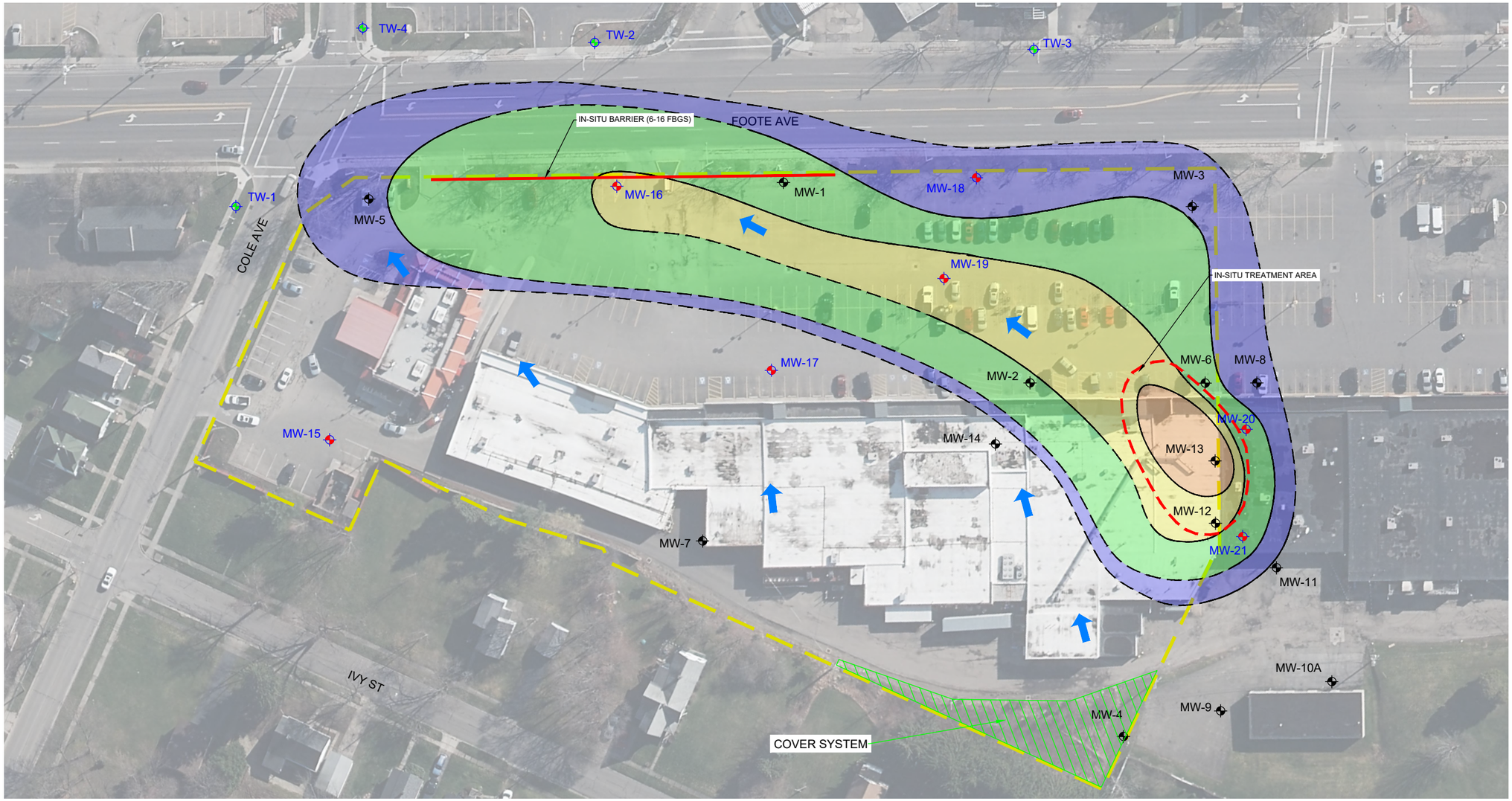
RI / AA REPORT

SOUTHSIDE PLAZA SITE
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

PREPARED FOR

LB-UBS 2007 - C6 - SOUTHSIDE STATION LLC c/o KAZMAREK MOWREY CLOUD LASETER LLP

FIGURE 6



LEGEND:

- PROPERTY BOUNDARY APPROXIMATE
- MW-1 HISTORIC MONITORING WELL (14)
- MW-15 RI OVERBURDEN WELL (7)
- TW-1 TEMPORARY 1" OVERBURDEN WELL (3)
- GROUNDWATER FLOW DIRECTION
- PCE CONCENTRATION OF 5-100 ug/L
- PCE CONCENTRATION OF 101-2,000 ug/L
- PCE CONCENTRATION OF 2,001-5,000 ug/L
- PCE CONCENTRATION OF 5,001-100,000 ug/L

N

80' 0' 80' 160'

SCALE: 1 INCH = 80 FEET
SCALE IN FEET
(approximate)

DATE: JUNE2020
DRAFTED BY: CMC

COMPARISON TO RESTRICTED USE SCOs

RI / AA REPORT

SOUTHSIDE PLAZA SITE
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

PREPARED FOR

LB-UBS 2007 - C6 - SOUTHSIDE STATION LLC c/o KAZMAREK MOWREY CLOUD LASETER LLP

JOB NO.: 0505-019-001

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FIGURE 7

APPENDIX A

PREVIOUS ASSESSMENTS AND INVESTIGATIONS

Table 1
Soil Analytical Results

Southside Plaza
704-744 Foote Avenue
Jamestown, New York

Soil Sample ID	SB-01	SB-02	SB-03	SB-04	SB-5	SB-6	SB-7	Unrestricted Use Soil Cleanup Objectives
Sampling Date	**8/18/2008**	**8/18/2008**	**8/18/2008**	**8/18/2008**	**3/31/2010**	**3/31/2010**	**3/31/2010**	
Sample Interval	**12-14 feet**	**1-2 feet**	**10-12 feet**	**8-10 feet**	**4-8 feet**	**8-12 feet**	**12-16 feet**	
Volatile Organic Compounds (µg/kg)								
Benzene	<10	<10	<10	<10	NA	NA	NA	60
Toluene	<10	<10	<10	<10	NA	NA	NA	700
Ethylbenzene	<10	<10	<10	<10	NA	NA	NA	1,000
Xylenes (total)	<10	<10	<10	<10	NA	NA	NA	1,600
Methyl Tertiary Butyl Ether	<10	<10	<10	<10	NA	NA	NA	930
1,1-Dichloroethene	<10	<10	<10	<10	<12	<12	<12	330
1,1,1-Trichloroethane	<10	<10	<10	<10	<12	<12	<12	680
cis-1,2-Dichloroethylene	<10	<10	<10	<10	<12	<12	<12	250
trans-1,2-Dichloroethylene	<10	<10	<10	<10	<12	<12	<12	190
Methylene chloride	<10	<10	<10	<10	**19 J,B**	**18 J,B**	**18 J,B**	50
Tetrachloroethylene	<10	<10	<10	<10	<12	<12	<12	1,300
Trichloroethylene	<10	<10	<10	<10	<12	<12	<12	470
Vinyl Chloride	<10	<10	<10	<10	<12	<12	<12	20

Soil Sample ID	SB-8	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	Unrestricted Use Soil Cleanup Objectives
Sampling Date	**3/31/2010**	**5/25/2010**	**5/25/2010**	**5/25/2010**	**5/25/2010**	**5/25/2010**	**2/1/2011**	
Sample Interval	**4-8 feet**	**8-10 feet**	**6-8 feet**	**8-10 feet**	**6-8 feet**	**4-6 feet**	**14-16 feet**	
VOCs (µg/kg)								
1,1-Dichloroethene	<12	<12	<12	<12	<12	<12	<11	330
1,1,1-Trichloroethane	<12	<12	<12	<12	<12	<12	<11	680
cis-1,2-Dichloroethylene	<12	<12	<12	<12	<12	<12	<11	250
trans-1,2-Dichloroethylene	<12	<12	<12	<12	<12	<12	<11	190
Methylene chloride	**17 J,B**	**28 B**	**28 B**	**28 B**	**26 B**	**24 B**	**19 J,B**	50
Tetrachloroethylene	**3.5 J**	<12	<12	**37**	<12	<12	<11	1,300
Trichloroethylene	<12	<12	<12	**4 J**	<12	<12	<11	470
Vinyl Chloride	<12	<12	<12	<12	<12	<12	<11	20

Soil Sample ID	MW-7	MW-8		MW-9	MW-10A		MW-11	Unrestricted Use Soil Cleanup Objectives
Sampling Date	**2/1/2011**	**12/6/2011**	**12/6/2011**	**12/6/2011**	**12/7/2011**	**12/7/2011**	**12/7/2011**	
Sample Interval	**12-14 feet**	**4-6 feet**	**10-12 feet**	**10-12 feet**	**6-8 feet**	**8-10 feet**	**6-8 feet**	
VOCs (µg/kg)								
1,1-Dichloroethene	<11	<5.7	<5.7	<5.9	<5.6	<5.4	<5.6	330
1,1,1-Trichloroethane	<11	<5.7	<5.7	<5.9	<5.6	<5.4	<5.6	680
cis-1,2-Dichloroethylene	<11	<5.7	<5.7	<5.9	<5.6	<5.4	<5.6	250
trans-1,2-Dichloroethylene	<11	<5.7	<5.7	<5.9	<5.6	<5.4	<5.6	190
Methylene chloride	**20 J,B**	<22.6	<22.8	<23.6	<22.6	<21.7	<22.3	50
Tetrachloroethylene	**110**	<5.7	**9.7**	<5.9	<5.6	<5.4	<5.6	1,300
Trichloroethylene	<11	<5.7	<5.7	<5.9	<5.6	<5.4	<5.6	470
Vinyl Chloride	<11	<5.7	<5.7	<5.9	<5.6	<5.4	<5.6	20

Soil Sample ID	SB-9		SB-10		SB-12		Unrestricted Use Soil Cleanup Objectives
Sampling Date	**4/16/2015**	**4/16/2015**	**4/16/2015**	**4/16/2015**	**4/15/2015**	**4/15/2015**	
Sample Interval	**0-2 feet**	**6-8 feet**	**6-8 feet**	**10-12 feet**	**4-8 feet**	**8-11 feet**	
VOCs (µg/kg)							
1,1-Dichloroethene	<6.7	<6.4	<5.8	<5.9	<5.8	<6.2	330
1,1,1-Trichloroethane	<6.7	<6.4	<5.8	<5.9	<5.8	<6.2	680
cis-1,2-Dichloroethylene	<6.7	<6.4	<5.8	<5.9	<5.8	<6.2	250
trans-1,2-Dichloroethylene	<6.7	<6.4	<5.8	<5.9	<5.8	<6.2	190
Methylene chloride	<33	<32	<29	<30	<29	<31	50
Tetrachloroethylene	<6.7	<6.4	**950**	**1,100**	**1,300**	**300**	1,300
Trichloroethylene	<6.7	<6.4	<5.8	<5.9	<5.8	<6.2	470
Vinyl Chloride	<6.7	<6.4	<5.8	<5.9	<5.8	<6.2	20

Table 1
Soil Analytical Results

Southside Plaza
704-744 Foote Avenue
Jamestown, New York

Soil Sample ID	SB-13		SB-14		Unrestricted Use Soil Cleanup Objectives
Sampling Date	4/15/2015	4/15/2015	4/16/2015	4/16/2015	
Sample Interval	6-10 feet	10-13.5 feet	2-4 feet	8-12 feet	
VOCs (µg/kg)					
1,1-Dichloroethene	<6	<5.7	<6.6	<5.8	330
1,1,1-Trichloroethane	<6	<5.7	<6.6	<5.8	680
cis-1,2-Dichloroethylene	**58**	<5.7	<6.6	<5.8	250
trans-1,2-Dichloroethylene	<6	<5.7	<6.6	<5.8	190
Methylene chloride	<30	<28	**41**	<29	50
Tetrachloroethylene	**14,000**	**840**	<6.6	<5.8	1,300
Trichloroethylene	**21**	<5.7	<6.6	<5.8	470
Vinyl Chloride	<6	<5.7	<6.6	<5.8	20

Notes :

Bold - Values exceed laboratory detection limits.
J - Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration.
B - Analyte is found in the associated analysis batch blank.
NA - Parameter not analyzed.
Unrestricted Use Soil Cleanup Objectives Table 375-6.8(a). NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives. December 14, 2006.

Table 1
Historical Soil-Gas, Sub-Slab Vapor, and Indoor Air Analytical Results

Southside Plaza
704-780 Foote Avenue
Jamestown, New York

Sample Type	Southside Station, Inc. Property								NYSDOH Guidance Action* (µg/m3)		
	Soil-Gas		Sub-Slab Vapor			Indoor Air					
Sample Date	8/18/2008	8/18/2008	8/18/2008	8/18/2008	3/31/2010	3/31/2010	3/31/2010	3/31/2010			
Analyte Concentration ($\mu g/m^3$)	SV-01	SV-02	SS-01	SS-02	SS-UPS	IA-QM1	IA-QM2	IA-UPS	NFA**	Monitor	Mitigate
1,1-dichloroethene	<7.42	<1.48	<1.43	<14.5	<3.5	<93	<4.1	<760	< 100	100 to < 1,000	≥ 1,000
1,1,1-trichloroethane	<10.2	<2.03	***161***	< 19.8	<4.9	<130	<5.7	***630***	< 100	100 to < 1,000	≥ 1,000
carbon tetrachloride	<11.7	<2.34	< 2.25	< 22.9	<5.6	<150	<6.5	<1,200	< 50	50 to < 250	≥ 250
cis-1,2-dichloroethene	***137***	<1.48	<1.43	<14.5	<3.5	<93	<4.1	<760	< 100	100 to < 1,000	≥ 1,000
tetrachloroethylene	**1,310**	34.5	***152***	***104***	6.7	<160	<7	<1,300	< 100	100 to < 1,000	≥ 1,000
trichloroethylene	***224***	7.65	16.9	<19.5	<4.8	<130	<5.6	<1,000	< 50	50 to < 250	≥ 250
vinyl chloride	<4.76	<0.952	<0.915	<9.29	<2.3	<60	<2.7	<490	< 50	50 to < 250	≥ 250

Notes :
Bold/Italics - Result detected above NYSDOH Monitor Guidance Action Concentrations.
Bold/Underlined - Result detected above NYSDOH Mitigate Guidance Action Concentrations.
* New York State Department of Health Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006 and June 25, 2007.
** NFA = No Further Action

Table 2
Sub-Slab Vapor Analytical Results

Southside Plaza
704-780 Foote Avenue
Jamestown, New York

Sample Type	Sub-Slab Vapor									NYSDOH Guidance Action* (µg/m^3)		
	Southside Station Inc. Property					Southside Foote Avenue Plaza Property						
Sample Date	**3/21/2012**	**3/21/2012**	**3/21/2012**	**3/21/2012**	**3/21/2012**	**7/3/2012**	**7/3/2012**	**7/3/2012**	**7/3/2012**			
Analyte Concentration (µg/m^3)	**SS-1**	**SS-2**	**SS-3**	**SS-4**	**SS-5**	**SS-6**	**SS-7**	**SS-8**	**SS-9**	**NFA****	**Monitor**	**Mitigate**
1,1-dichloroethene	<0.68	<0.65	<0.68	<62	<700	<760	<17	<0.75	<0.74	< 100	100 to < 1,000	≥ 1,000
1,1,1-Trichloroethane	<0.93	<0.88	<0.92	<84	<950	<1000	<24	<1	<1	< 100	100 to < 1,000	≥ 1,000
carbon tetrachloride	0.42	0.48	0.40	<9.8	<110	<120	<2.8	0.52	0.51	< 50	50 to < 250	≥ 250
cis-1,2-dichloroethene	<0.68	<0.65	<0.68	<62	**4,300**	<760	<17	<0.75	<0.74	< 100	100 to < 1,000	≥ 1,000
tetrachloroethylene	2.8	18	22	**7,000**	**65,000**	**88,000**	**2,100**	17	***140***	< 100	100 to < 1,000	≥ 1,000
trichloroethylene	<0.093	0.32	0.15	***240***	**1,100**	**1,200**	6.7	0.16	0.18	< 50	50 to < 250	≥ 250
vinyl chloride	<0.093	<0.088	0.11	<8.4	<95	<100	<2.4	<0.10	<0.10	< 50	50 to < 250	≥ 250

Notes :
Bold/Italics - Result detected above NYSDOH Monitor Guidance Action Concentrations
Bold/Underlined - Result detected above NYSDOH Mitigate Guidance Action Concentrations
* New York State Department of Health Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006 and June 25, 2007.
** NFA = No Further Action

Table 2
Indoor and Outdoor Air Analytical Results

Southside Plaza
704-744 Foote Avenue
Jamestown, New York

Sample Type	**Indoor and Outdoor Air Samples Concentrations (µg/m3)**					**NYSDOH Guidance Action* (µg/m^3)**		
Sample Date	**4/2/2013**	**4/2/2013**	**4/2/2013**	**4/2/2013**	**4/2/2013**			
Analyte	**IA-1**	**IA-2**	**IA-3**	**IA-4**	**OA-1**	**NFA****	**Monitor**	**Mitigate**
1,1-dichloroethene	<0.66	<0.79	<3.1	<0.64	<0.61	< 100	100 to < 1,000	≥ 1,000
1,1,1-Trichloroethane	<0.90	<1.1	<4.2	<0.87	<0.83	< 100	100 to < 1,000	≥ 1,000
carbon tetrachloride	0.71	0.67	0.58	0.52	0.56	< 50	50 to < 250	≥ 250
cis-1,2-dichloroethene	<0.66	<0.79	<3.1	<0.64	<0.61	< 100	100 to < 1,000	≥ 1,000
tetrachloroethylene	1.3	1.3	18	0.45	<0.11	< 100	100 to < 1,000	≥ 1,000
trichloroethylene	<0.090	<0.11	<0.42	<0.087	<0.083	< 50	50 to < 250	≥ 250
vinyl chloride	<0.090	<0.11	<0.42	<0.087	<0.083	< 50	50 to < 250	≥ 250

Notes :
Bold - Results detected above laboratory detection limits.
* New York State Department of Health Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006 and
** NFA = No Further Action

TABLE 4
SUB-SLAB DEPRESSURIZATION SYSTEM VACUUM READINGS BENEATH CONCRETE SLAB OF TOPS MARKET
MAY 2, 2019

SOUTHSIDE PLAZA
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

Soil Vapor Monitoring Point	Measured Vacuum (inches water column)
SV-01	0.10
SV-02	0.20
SV-03	0.00

Table 2
Groundwater Analytical Results

Southside Plaza
704-744 Foote Avenue
Jamestown, New York

Temporary Monitoring Well ID	SB-01	SB-02	SB-03	GW-5	GW-6	GW-7	GW-8	GW-9	NYSDEC TOGS111 Groundwater Standard *
Sampling Date	**8/18/2008**	**8/18/2008**	**8/18/2008**	**3/31/2010**	**3/31/2010**	**3/31/2013**	**3/31/2013**	**3/31/2013**	
Volatile Organic Compounds (µg/L)									
Benzene	<5	<5	<5	NA	NA	NA	NA	NA	1
Toluene	<5	<5	<5	NA	NA	NA	NA	NA	5
Ethylbenzene	<5	<5	<5	NA	NA	NA	NA	NA	5
Xylene	<5	<5	<5	NA	NA	NA	NA	NA	5
Methyl Tertiary Butyl Ether	<5	<5	<5	NA	NA	NA	NA	NA	NS
1,1-Dichloroethene	<5	<5	<5	<5	<5	<5	<5	<5	5
1,1,1-Trichloroethane	<5	<5	<5	<5	<5	<5	<5	<5	5
cis-1,2-Dichloroethylene	<5	<5	<5	<5	<5	<5	<5	<5	5
trans-1,2-Dichloroethylene	<5	<5	<5	<5	<5	<5	<5	<5	5
Methylene chloride	<5	<5	<5	3.5 J,B	3.9 J,B	3.8 J,B	3.9 J,B	3.8 J,B	5
Tetrachloroethylene	**62**	<5	<5	**50**	**53**	<5	**22**	**31**	5
Trichloroethylene	<5	<5	<5	1 J	2.2 J	<5	<5	2.3	5
Vinyl Chloride	<5	<5	<5	<5	<5	<5	<5	<5	2

Monitoring Well ID	MW-1	MW-2	MW-3	MW-3 Duplicate	MW-4	MW-5	MW-6	NYSDEC TOGS111 Groundwater Standard *
Sampling Date	**6/1/2010**	**6/1/2010**	**6/1/2010**	**6/1/2010**	**6/1/2010**	**6/1/2010**	**4/14/2011**	
Volatile Organic Compounds (µg/L)								
1,1-Dichloroethene	<5	<5	<5	<5	<5	<5	<5	5
1,1,1-Trichloroethane	<5	<5	<5	<5	<5	<5	<5	5
cis-1,2-Dichloroethylene	3.2 J	2.8 J	1.8 J	1.8 J	<5	<5	**63**	5
trans-1,2-Dichloroethylene	<5	<5	<5	<5	<5	<5	3.6 J	5
Methylene chloride	5.0 J,B	4.2 J,B	3.5 J,B	4.4 J,B	3.0 J,B	2.6 J,B	**5.3 J,B**	5
Tetrachloroethylene	**210**	**2,300**	**190**	**200**	<5	**110**	**1,200**	5
Trichloroethylene	**9.4**	**39**	4.2 J	3.7 J	<5	**6.4**	**28**	5
Vinyl Chloride	**2.9 J**	<5	<5	<5	<5	<5	**2.8 J**	2

Monitoring Well ID	MW-7	MW-7 Duplicate	MW-8	MW-8 Duplicate	MW-9	MW-10A	MW-11	NYSDEC TOGS111 Groundwater Standard *
Sampling Date	**4/14/2011**	**4/14/2011**	**12/13/2011**	**12/13/2011**	**12/13/2011**	**12/13/2011**	**12/13/2011**	
Volatile Organic Compounds (µg/L)								
1,1-Dichloroethene	<5	<5	<1	<1	<1	<1	<1	5
1,1,1-Trichloroethane	<5	<5	<1	<1	<1	<1	<1	5
cis-1,2-Dichloroethylene	<5	<5	<1	<1	<1	<1	<1	5
trans-1,2-Dichloroethylene	<5	<5	<4	<4	<4	<4	<4	5
Methylene chloride	4.7 J,B	4.9 J,B	<4	<4	<4	<4	<4	5
Tetrachloroethylene	1.0 J	<5	**31.6**	**31.8**	<1	<1	**11.5**	5
Trichloroethylene	<5	<5	<1	<1	<1	<1	<1	5
Vinyl Chloride	<5	<5	<0.4	<0.4	<0.4	<0.4	<0.4	2

Monitoring Well ID	MW-12	MW-13	MW-13D	MW-14	NYSDEC TOGS111 Groundwater Standard *
Sampling Date	**4/17/2015**	**4/17/2015**	**4/17/2015**	**4/17/2015**	
Volatile Organic Compounds (µg/L)					
1,1-Dichloroethene	<1	**5.8**	**5.7**	<1	5
1,1,1-Trichloroethane	3	**26**	**26**	<1	5
cis-1,2-Dichloroethylene	1.7	**530**	**490**	<1	5
trans-1,2-Dichloroethylene	<1	**7.2**	**6.9**	<1	5
Methylene chloride	<5	<5	<5	<5	5
Tetrachloroethylene	**4,200**	**32,000**	**30,000**	**51**	5
Trichloroethylene	**6.8**	**180**	**180**	<1	5
Vinyl Chloride	<1	14	14	<1	2

Notes :

Bold/Underlined - Values exceed NYSDEC TOGS111 Groundwater Standard.

J - Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration.

B - Analyte is found in the associated analysis batch blank.

NA - Parameter not analyzed.

NS - No standard or guidance value for groundwater is available for this substance.

* NYSDEC Class GA Ambient Water Quality Standards and Guidance Values, NYSDEC Division of Water Quality and Operational Guidance Series (1.1.1) - Ambient Water Quality and Guidance Values and Effluent Limitations Reissued June 1998.

TABLE 1
DEPTH TO GROUNDWATER AND RELATIVE GROUNDWATER ELEVATIONS
APRIL 17 and 18, 2019

SOUTHSIDE PLAZA
704-744 FOOTE AVENUE
JAMESTOWN, NEW YORK

WELL LOCATION	Depth to Water (feet)	Top of Casing Elevation ** (feet)	Groundwater Elevation (feet0
MW - 1	6.87	98.52	91.65
MW - 2	4.78	99.14	94.36
MW - 4	5.10	105.72	100.62
MW - 6	3.83	100.01	96.18
MW - 7	4.66	99.69	95.03
MW - 9	3.30	103.97	100.67
MW - 10A	3.52	100.98	97.46
MW - 12	2.91	--	NA
MW - 13	4.17	--	NA
MW -14	5.12	--	NA

** Top of casing elevations obtained from *Offsite Investigation Report* , prepared by APEX, dated January 20, 2012 (Elevations measued in reference to an arbitrary elevation of 100 feet above meas sea level)

TABLE 2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS (VOCs) AND 1,4-DIOXANE MEASURED IN COLLECTED GROUNDWATER SAMPLES
April 17 and 18, 2019

SOUTHSIDE PLAZA
704 FOOTE AVENUE
JAMESTOWN, NEW YORK

Sample ID	NY TOGS Class GA Standards	MW - 1	MW - 2	MW - 4	MW-DUP (MW - 4)	MW - 6	MW - 7	MW - 9	MW - 10A
Lab Sample Number		**JC86738-1**	**JC86738-2**	**JC86738-3**	**JC86738-11**	**JC86738-4**	**JC86738-5**	**JC86738-6**	**JC86738-7**
Sampling Date		**4/17/2019**	**4/18/2019**	**4/17/2019**	**4/17/2019**	**4/18/2019**	**4/17/2019**	**4/17/2019**	**4/17/2019**
Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Volatile Organic Compounds (VOCs)									
Bromodichloromethane	NS	ND (4.8)	ND (1.9)	ND (0.48)	ND (0.58)	ND (1.9)	ND (0.48)	ND (0.48)	ND (0.48)
Chloroform	7	ND (5.0)	ND (2.0)	ND (0.50)	ND (0.50)	ND (2.0)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,2-Dichloroethene	5	**25**	**4.4**	ND (0.51)	ND (0.51)	**56.3**	ND (0.51)	ND (0.51)	ND (0.51)
trans-1,2-Dichloroethene	5	ND (5.4)	ND (2.1)	ND (0.54)	ND (0.54)	**5.3**	ND (0.54)	ND (0.54)	ND (0.54)
Tetrachloroethene	5	**3050**	**1420**	ND (0.90)	ND (0.90)	**1620**	**15.6**	ND (0.90)	ND (0.90)
Trichloroethene	5	**102**	**56.9**	ND (0.53)	ND (0.53)	**24.4**	ND (0.53)	ND (0.53)	ND (0.53)
Vinyl chloride	2	ND (7.9)	ND (3.1)	ND (0.79)	ND (0.79)	ND (3.1)	ND (0.79)	ND (0.79)	ND (0.79)
Semi-Volatile Organic Compounds (SVOCs)									
1,4-Dioxane	NS	**0.126** [b]	ND (0.048)	NA	NA	NA	NA	ND (0.049) [b]	NA

Qualifiers

NS - No Standard NA - Not Analyzed

µg/L - micrograms per liter

ND - The compound was not detected at the indicated concentration.

* - New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series 1.1.1 (TOGS) Ambient Water Quality Standard and Guidance Value, June 1998 with April 2000 and June 2004 Addendums

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than MDL. The concentration given is an approximate value.

(b) - This compound is outside the control limits biased low in the associated blank spike. Results confirmed by reextrtaction outside holding time.

Bold = Concentration detected above the method detection limit

Shading = Concentration exceeds NYSDEC TOGS Ambient Water Quality Standard and Guidance Values (WQSGV)

TABLE 2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS (VOCs) AND 1,4-DIOXANE MEASURED IN COLLECTED GROUNDWATER SAMPLES
April 17 and 18, 2019

SOUTHSIDE PLAZA
704 FOOTE AVENUE
JAMESTOWN, NEW YORK

Sample ID	NY TOGS Class GA Standards	MW - 12	MW - 13	MW - 14	FIELD BLANK	TRIP BLANK
Lab Sample Number		**JC86738-8**	**JC86738-9**	**JC86738-10**	**JC86738-12**	**JC86738-13**
Sampling Date		**1/16/1900**	**4/18/2019**	**4/18/2019**	**4/17/2019**	**4/17/2019**
Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Volatile Organic Compounds (VOCs)						
Bromodichloromethane	NS	ND (0.58)	ND (29)	ND (0.58)	**1**	ND (0.58)
Chloroform	7	ND (0.50)	ND (25)	ND (0.50)	**4.9**	ND (0.50)
cis-1,2-Dichloroethene	5	**0.58 J**	**140**	ND (0.51)	ND (0.51)	ND (0.51)
trans-1,2-Dichloroethene	5	ND (0.54)	ND (27)	ND (0.54)	ND (0.54)	ND (0.54)
Tetrachloroethene	5	**621**	**27100**	ND (0.90)	ND (0.90)	ND (0.90)
Trichloroethene	5	**1.0**	**88.7**	ND (0.53)	ND (0.53)	ND (0.53)
Vinyl chloride	2	ND (0.79)	ND (39)	ND (0.79)	ND (0.79)	ND (0.79)
Semi-Volatile Organic Compounds (SVOCs)						
1,4-Dioxane	NS	NA	NA	NA	NA	NA

Qualifiers

NS - No Standard NA - Not Analyzed

µg/L - micrograms per liter

ND - The compound was not detected at the indicated concentration.

* - New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series 1.1.1 (TOGS) Ambient Water Quality Standard and Guidance Value, June 1998 with April 2000 and June 2004 Addendums

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than MDL. The concentration given is an approximate value.

(b) - This compound is outside the control limits biased low in the associated blank spike. Results confirmed by reextrtaction outside holding time.

Bold = Concentration detected above the method detection limit

Shading = Concentration exceeds NYSDEC TOGS Ambient Water Quality Standard and Guidance Values (WQSGV)

TABLE 3
PER- AND POLYFLUOROALKYL SUBSTANCES DETECTED IN COLLECTED GROUNDWATER SAMPLES
April 17 and 18, 2019

SOUTHSIDE PLAZA
704 FOOTE AVENUE
JAMESTOWN, NEW YORK

Sample ID	PFAS Family	MW - 1	MW - 2	MW - 9
Lab Sample Number		FA63499-1	FA63499-2	FA63499-3
Sampling Date		4/17/2019	4/18/2019	4/17/2019
Units		ng/L	ng/L	ng/L
Semi-Volatile Organic Compounds (SVOCs)				
Perfluorobutanoic acid	Perfluoroalkyl Carboxylates	**8.77 B**	**10.0 B**	**5.90 JB**
Perfluoropentanoic acid		**15.1**	**11.6**	ND (1.8)
Perfluorohexanoic acid		**7.85**	**8**	ND (1.2)
Perfluoroheptanoic acid		**3.77**	**4.76**	ND (1.2)
Perfluorooctanoic acid		**5.43**	**9.53**	**3.06**
Perfluorononanoic acid		ND (1.0)	ND (1.0)	ND (1.2)
Perfluorodecanoic acid		ND (1.0)	ND (1.0)	ND (1.2)
Perfluoroundecanoic acid		ND (1.0)	ND (1.0)	ND (1.2)
Perfluorododecanoic acid		ND (1.5)	ND (1.5)	ND (1.8)
Perfluorotridecanoic acid		ND (1.0)	ND (1.0)	ND (1.2)
Perfluorotetradecanoic acid		ND (1.0)	ND (1.0)	ND (1.2)
Perfluorobutanesulfonic acid	Perfluoroalkyl Sufonates	**1.74 J**	**1.51 J**	**1.31 J**
Perfluorohexanesulfonic acid		**2.12**	**2.08**	ND (1.2)
Perfluoroheptanesulfonic acid		ND (1.0)	ND (1.0)	ND (1.2)
Perfluorooctanesulfonic acid		ND (1.5)	**5.97**	**2.39 J**
Perfluorodecanesulfonic acid		ND (1.0)	ND (1.0)	ND (1.2)
PFOSA	Perfluoroctane-sulfonamides	ND (1.0)	ND (1.0)	ND (1.2)
MeFOSAA	Perfluoroctane-sulfonamidoacetic acids	ND (4.0)	ND (4.0)	ND (4.8)
EtFOSAA		ND (4.0)	ND (4.0)	ND (4.8)
6:2 Fluorotelomer sulfonate	Fluroinated Telomer Sulfonates	ND (2.0)	ND (2.0)	**6.18 J**
8:2 Fluorotelomer sulfonate		ND (2.0)	ND (2.0)	ND (2.4)

Qualifiers

ng/L - nanograms per liter

ND - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than MDL. The concentration given is an approximate value.

B - Analyte found in associated method blank

Bold = Concentration detected above the method detection limit

APPENDIX B

PROJECT PHOTOGRAPHIC LOG

SITE PHOTOGRAPHS

Photo 1:

Photo 2:

Photo 3:

Photo 4:

Photo 1: Soil vapor advancement (4/16/2020)

Photo 2-4: Soil vapor sampling: summa canister placement

SITE PHOTOGRAPHS

Photo 5:

Photo 6:

Photo 7:

Photo 8:

Photos 5 and 6: MW-15 installation (4/16/2020)

Photos 7 and 8: MW-15 split spoon (4/16/2020)

SITE PHOTOGRAPHS

Photo 9:

Photo 10:

Photo:11

Photo 12:

Photos 9 and 10: MW-16 installation (4/16/2020)

Photos 11 and 12: MW-16 split spoon (4/16/2020)

SITE PHOTOGRAPHS

Photo 13:

Photo 14:

Photo 15:

Photo 16:

Photo 13: MW-1D installation (4/17/20)

Photo 14: MW-1D split spoon (18'-20')

Photo 15: MW-18 installation (4/20/20)

Photo 16: MW-18 split spoon (14'-16')

SITE PHOTOGRAPHS

Photo 17:

Photo 18:

Photo 19:

Photo 20:

Photo 17: MW-17 installation (4/20/20)

Photo 18: MW-17 split spoon (4'-6')

Photo 19: MW-19 installation (4/20/20)

Photo 20: MW-19 split spoon (14'-16')

SITE PHOTOGRAPHS

Photo 21:

Photo 22:

Photo 23:

Photo 24:

Photo 21: Soil boring advancement (Salon location)

Photo 22: Soil boring SB-30 (Salon location)

Photo 23: Soil boring advancement (inside TOPS)

Photo 24: Soil boring SB-28 (inside TOPS)

SITE PHOTOGRAPHS

Photo 25:

Photo 26:

Photo 27:

Photo 28:

Photo 25: Soil boring SB-23 advancement (4/22/20)

Photo 26: Soil boring SB-23 (12'-14') (4/22/20)

Photo 27: Soil boring SB-25 advancement (4/22/20)

Photo 28: Soil boring SB-25 (2'-4') (4/22/20)

SITE PHOTOGRAPHS

Photo 29:

Photo 30:

Photo: 31

Photo 32:

Photo 29: Soil boring SB-15 advancement (4/23/20)

Photo 30: Soil boring SB-15 (12'-14') (4/23/20)

Photo 31: Soil boring SB-21 advancement (4/23/20)

Photo 32: Soil boring SB-21 (4'-6') (4/23/20)

SITE PHOTOGRAPHS

Photo 33:

Photo 34:

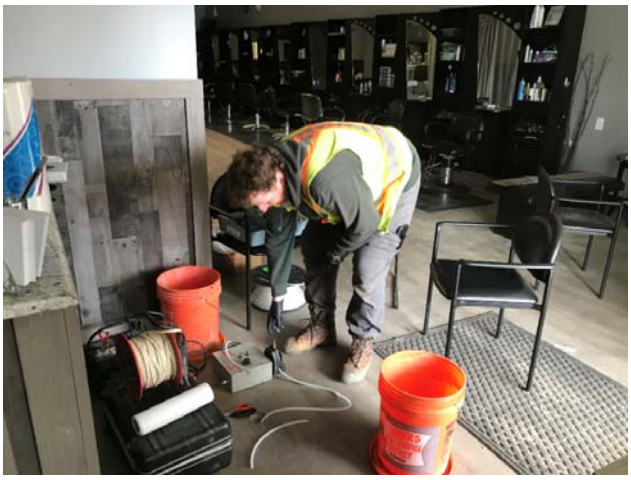

Photo 35:

Photo 36:

Photo 33: Well repair (4/24/20)

Photo 34: Well MW-20 development in Salon (4/24/20)

Photo 35: Well MW-21 completion in Salon (4/25/20)

Photo 36: Groundwater sampling (MW-15)

APPENDIX C

SOIL BORING AND MONITORING WELL LOGS

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside Plaza	Log of Boring No.: MW-1D
BORING LOCATION:	ELEVATION AND DATUM: Was not converted into a well
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/17/20 — DATE FINISHED: 4/20/20
DRILLING METHOD: 7751 4¼ Augers	TOTAL DEPTH: 20.5 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Continuous 5ft Spoon	DEPTH TO WATER: FIRST: 7.0 COMPL.: — CASING:
SAMPLING METHOD: 2' Continuous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
	1		33 20 13	53	1.2'	0.7	asphalt 0.4' Thick 0-0.7 Brown, mostly FS, some NPF, Dense 0.7-1.2 Dark gray, moist mostly LPF, Some FS Trace Brick & gravel	
2	2		4 4 4 4	8	1.3	0.2	0-2 Sandy lean clay gray moist mostly MPF, some FS Trace FG	
4	3		4 7 7 13	14	1.5	0.5	0-2 As Above Iron staing Rock Frugments In shoe	
6	4		3 4 4 5	8	1.6	2.3	0-2 As Above, wet 7.0' Trace FG Stiff.	
8	5		5 7 8 8	15	0.9	0.0	Sand & Gravel (Till) 0-2 Brown, wet, mostly FS, little NPF, Few sub round FG,	grout
10	6		3 14 8 14	22	1.2	2.7	0-2 As Above	
12	7		4 18 18 21	36	1.2	7.8	As Above	
14	8		20 27 40 100/4	67	1.3	6.5	As Above, moist shale In shoe	
16	9		25 37 54 57	91	1.5	0.5	As Above shale Frugments	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside Plaza	Log of Boring No.: MW-1D cont
BORING LOCATION:	ELEVATION AND DATUM: Was not converted into a well
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/17/20 / DATE FINISHED: 4/17/20
DRILLING METHOD: HSA 4 1/4 Augers	TOTAL DEPTH: 20.5 / SCREEN INTERVAL:
DRILLING EQUIPMENT: D-120	DEPTH TO WATER: FIRST: 7.0 COMPL.: / CASING:
SAMPLING METHOD: 2' Continuous Split Spoon	LOGGED BY:
HAMMER WEIGHT: / DROP:	RESPONSIBLE PROFESSIONAL: / REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
			17				0 - 0.7 As Above	
19	10		32	89	1.2	1.0	0.7 - 1.2 Reddish Brown, Dry, Hard, moist NPF, Breaks with Hand Pressure Weathered TOR? Basal Till?!	grout
			57					
20			99					
			100/5					
	11				0.5	1.2	Weathered TOR. Spoon Refusal Spoon Refusal EOB 20.5'	
22								
24								
26								
28								
30								
32								
34								
36								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South side plaza	Log of Boring No.: SB-15
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/28/20 — DATE FINISHED: 9/23
DRILLING METHOD: 2¼" HSA	TOTAL DEPTH: 15.0 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Dietrich D-120	DEPTH TO WATER: FIRST: 6.0 COMPL.: — CASING:
SAMPLING METHOD: Continuous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
	1		36 20 18	38	0.7	0.0	0-0.6" Asphalt 0-0.7 Pebbly Subbase Grey + Brown sand mixed w gravel	
2	2		21 10 5 4	15	1.5	0.1	2-3 Fill sand + gravel mix 3-4 grey sandy lean clay, moist mostly MPF, some FS, stiff	
4	3		4 2 2 2	4	0.8	0.2	As Above 3-4 BROWN	
6	4		40 14 11 10	30	1.2	0.5	Silty sand Brown, wet (6), mostly FS with some MPF Rock Dieletory	
8	5		2 2 2 3	4	0.7	0.3	As Above, Trace FG	
10	6		5 28 22 22	50	0.6	6.1	Till wet Brown, mostly, FS w/ little FG.	
12	7		32 28 34 18	62	0.5	0.0	Till , moist, mostly LPF some FS, little FG Very stiff	
14	8		11 45 100/4		0.9	0.0	weathered Top of Rock, silty w/ Clay, mixed with Interbedded shale layers	
16							chips to 12.0'	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza	**Log of Boring No.:** SB-16
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/24/20 — DATE FINISHED: 4/24/20
DRILLING METHOD: 2 1/4 HSA	TOTAL DEPTH: 15.4 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Dietrich D-120	DEPTH TO WATER: FIRST: 7.0 — COMPL.: — CASING:
SAMPLING METHOD: 2.0" Continuous SS	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
	1		23 14 15	42	0.8	0.2	0-6" Asphalt R. Lot Sub-base Brown, mostly FS, little FG,	
2	2		6 6 7 9	13	1.2	0.0	Sandy lean clay, gray, moist, mostly MPF, some FS, stiff Iron staining	
4	3		5 5 6 8	11	1.4	0.0	As Above Brown,	
6	4		4 9 8 6	17	1.3	0.4	Till Brown wet 7.0', mostly MPF, Some FS, little FG.	
8	5		11 10 14 17	32	1.6	0.7	As Above,	
10	6		26 27 23 24	50	1.4	2.2	As Above, Moist	
12	7		13 21 45 53	66	1.6	1.8	Fill Brown, DRY, mostly Fine Sand, Few MPF, 13 to 13.5 shale Bedding	
14	8		13 47 10/4		1.0	0.6	As Above	
16							EOB 15.4' spoon Refusal dup to 12.0	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside Plaza	Log of Boring No.: SB-17
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/24/20 — DATE FINISHED: 4/24/20
DRILLING METHOD: 2 1/4" HSA	TOTAL DEPTH: 17.0 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: 9.0 COMPL.: — CASING:
SAMPLING METHOD: 2' Continous Split Spoons	LOGGED BY: TMB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
	1		21 31 22	53	1.1	0.0	0-0.6 Asphalt 0-0.5 Light subbase, clay 0.5-0.9 Asphalt 0.9-1.1 Silty sand with trace gravel Brown FS, Silty.	
2	2		17 16 10 9	26	0.9	0.0	Reworked Sand + gravel Fill Mostly FS, little FG, Trace NPF	
4	3		2 6 5 6	11	0.6	0.0	As Above	
6	4		1 1 3 3	4	0.9	0.0	Sandy lean clay, grey, moist, mostly NPF, Some FS, Trace FG; stiff	
8	5		1 2 2 3	4	1.2	0.0	As Above wet 9.0	
10	6		1 2 5 6	7	1.3	0.0	10-11 As Above, Black Discoloring Sandy silt, Brown, wet, mostly FS, Some NPF, w/ Some Black Discoloring	
12	7		4 8 16 19	24	0.8	0.0	12-13 As Above 13-14 Sand + gravel, Brown wet Mostly MS, little FG, Few NPF	
14	8		23 33 28 32	61	1.3	63	Till Brown, wet, mostly FS, little NPF, Few FG.	
16	9		19 10 5		0.9	6.0	As Above, Dry Spoon Refusal at 17.0' 1605-17 Top of weathered Rock Chipped to 17.5'	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South side plaza	Log of Boring No.: SB-18
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/27/20 — DATE FINISHED: 4/28/20
DRILLING METHOD: 2¼ HSA	TOTAL DEPTH: 13.7 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: 7.0 COMPL.: — CASING:
SAMPLING METHOD: 2' Continuous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
	1		5 7 9	12	0.6	0.8	0-0.7 Asphalt Fill Dark grey / Black, moist, w/ wood True FG.	
2	2		5 8 10 15	22	1.5	0.4	Sandy lean clay Brown / grey, moist, mostly LPF, Some FS, True FG, stiff	
4	3		7 9 11	31	1.9	1.7	As Above	
6	4		5 4 5 7	9	1.1	1.2	Brown, Wet (7.0'), mostly FS, Some NPF True FG, Silty Sand	
8	5		2 4 19 18	24	0.7	0.6	Till Brown, moist, Mostly, MPF, Some FS, Few FG. Stiff.	
10	6		4 7 9 16	16	1.0	0.9	As above, Dry, Reddish Brown	
12	7		15 38 57 100/½	95	0.8	0.3	Weathered TOR, Dry, Grey, mostly LPS	
14							TOR 13.7' Spoon Refusal	
16							Chips to 12.0	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

499-0956

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza		Log of Boring No.: SB-19	
BORING LOCATION:		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: Earth Dimensions		DATE STARTED: 4/23/20	DATE FINISHED: 4/23/20
DRILLING METHOD: 2 1/4" HSA		TOTAL DEPTH: 18.9	SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120		DEPTH TO WATER: FIRST: 9.0 COMPL.:	CASING:
SAMPLING METHOD: 2" Continuous Split Spoon		LOGGED BY: TAB	
HAMMER WEIGHT:	DROP:	RESPONSIBLE PROFESSIONAL:	REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
							0-0.7 Asphalt	
	1		16 15 10	31	14	0.0	0-2 Fill Sub-base Brown, mostly FS, Few NPF, Little FG	
2			11				Fill 2-3, grey gravel mixt w/ clay	
	2		36 12 3	48	1.5	0.0	3-3.5 Brown FS 3.5-4.0 grey, Sandy lean clay moist mostly NPF, some FS, Trace	
4			3					
	3		4 4 5	9	0.7	0.0	As Above 3.5-4.0	
6			2					
	4		4 5 4	9	1.3	0.0	As Above	
8			3					
	5		3 6 6	9	1.6	0.0	As Above, Trace FG Silty Sand 9.0' wet 9.0' Brown moist mostly FS w/some NPF, Trace FG	
10			6					
	6		7 8 8	15	1.4	0.0	As Above	
12			5				Sandy lenday	
	7		4 5 6	9	1.5	0.0	Brown, wet, mostly NPF, some FS. St. CE	
14			3					
	8		11 16 16	29	1.5	0.0	As Above to 13.0' Silty + gravel Till 4.0' wet Brown, wet, mostly FS, little FG, Trace LPF	
16			13					
	9		35 100/5		1.5	0.0	As Above, shale Fragments	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza	**Log of Boring No.:** SB-19 Cont
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/23/20 — DATE FINISHED: 4/23/20
DRILLING METHOD: 2 1/4" HSA	TOTAL DEPTH: 16.9 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: 9.0 COMPL.: — CASING:
SAMPLING METHOD: 2' Continuous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
			47/10"/4		0.4		A: ABO"	
							TOR 18.9 chalk to 16.0'	
2							EOB	
4								
6								
8								
10								
12								
14								
16								
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South side plaza	**Log of Boring No.: SB-20**
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/27/20 — DATE FINISHED: 4/27/20
DRILLING METHOD: 2 1/4" HSA	TOTAL DEPTH: 15.5 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Dietrich D-120	DEPTH TO WATER: FIRST: 8.0 COMPL.: — CASING:
SAMPLING METHOD: 2' Continuous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
							0-0.7 Asphalt	
	1		18 22 27	49	0.5	0.0	0-0.4 Mostly Brown, FS, Few MPF Few FG, gravel stuck In shoe	
2							P.L of Sub-base	
	2		19 11 5 8	16	0.2	0.4	2-4 Sandy lean Clay, Brown, moist Mostly MPF, Some FS, stiff	
4			1 3 3 10 11					
	3			16	1.5	0.0	As ABove, Iron staining	
6			2 6 6 7					
	4			12	1.3	1.0	As Above Trace gravel	
8							Till	
	5		4 3 3 4 3	6	0.9	0.5	Brown, wet, mostly MPF, w/ FS, Few Fe gravel Wet 8.0'	
10								
	6		4 5 11	9	1.0	0.2	As ABove, Low plasticity Fines	
12								
	7		5 4 5 6	9	0.9	3.2	As ABove, Few MPF	
14							Till	
	8		3 7 10/5.5		0.8	0.4	Gray, Hard, Dry, mostly MPF, Some FS, Trace FG 15.5 TOB, Spoon Refusal	
16							Chips to 12.8'	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South side Plaza		**Log of Boring No.:** SB-21	
BORING LOCATION:		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: Earth Dimensions		DATE STARTED: 4/23/20	DATE FINISHED: 4/23/20
DRILLING METHOD: HSA 2¼ inch		TOTAL DEPTH: 18.3'	SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120		DEPTH TO WATER: FIRST: 8.0 COMPL.:	CASING:
SAMPLING METHOD: 2" Continuous Split Spoon		LOGGED BY: TAB	
HAMMER WEIGHT:	DROP:	RESPONSIBLE PROFESSIONAL:	REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
0	1		21 11 10	32	1.2	0.1	0-0.5 Asphalt Sand+gravel Pilot Subsam- Brown, moist mostly FS, Few NPF, Little FG, Concrete In Sleeve	
2	2		10 12 7 3	19	0.1	0.1	As Above, Concrete chips	
4	3		2 1 2 2	3	0.7	0.5	Sandy lean clay Brown, moist, mostly, MpF, Some FS STIFF	
6	4		1 3 3 3	6	1.1	0.0	As Above	
8	5		3 2 3 5	5	1.7	0.1	As Above Iron, staining wet 8.0'	
10	6		6 6 8 9	14	1.2	0.2	Silty Sandy grey, wet mostly FS, Some NPF Rapid Dilatency	
12	7		3 5 5 9	10	1.5	0.0	As Above 13.5' Sandy lean clay, grey moist, mostly mpf, Some FS stiff	
14	8		1 3 5 4	8	1.3	0.7	As Above	
16	9		9 19 23 25	51	1.1	0.1	- Till Sand+gravel, wet	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside plaza		Log of Boring No.: SB-21 Cont	
BORING LOCATION:		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: Earth Dimensions		DATE STARTED: 4/23/20	DATE FINISHED: 4/23/20
DRILLING METHOD: 2¼" HSA		TOTAL DEPTH: 19.3	SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120		DEPTH TO WATER: FIRST: 8.1 COMPL.:	CASING:
SAMPLING METHOD: 2' Continuous Split spoon		LOGGED BY: TAB	
HAMMER WEIGHT:	DROP:	RESPONSIBLE PROFESSIONAL:	REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
			20				Reddish Brown, Dry, Hard, Mostly, NPF. with shale Fragments	
	10		26		1¼			
			100/4				18.5 TOR Spoon Refusal	
20							EOB 19.3'	Chipped hole to 18.5'
4								
6								
8								
10								
12								
14								
16								
18								

Project No: | Benchmark Environmental Engineering & Science, PLLC | Figure

ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side plaza	Log of Boring No.: SB-22
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/27/20 / DATE FINISHED: 4/27/20
DRILLING METHOD: 2 1/4" HSA	TOTAL DEPTH: 10.5' / SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: 6.0 COMPL.: / CASING:
SAMPLING METHOD: 2" Continuous Split Spoon	LOGGED BY:
HAMMER WEIGHT: / DROP:	RESPONSIBLE PROFESSIONAL: / REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							SURFACE ELEVATION (FMSL):	
0	1		28 27 33	55	0.7	0.7	0-0.6 Asphalt P.Lt subcoarse, Brown, moist, mostly FS, with little NPF Trace FG.	
2	2		17 26 20 30	46	2.0	0.0	Fill, clay, Fill Mixed w/ Asphal Till Brown moist Mostly, LPF, Some FS, little FG.	
4	3		10 51 13 9	64	1.0	0.0	As Above	
6	4		6 25 22 13	47	1.2	0.3	Till with Inter Interstratified shale bedding, wet	
8	5		12 33 58 100/5	91	1.2	0.1	Reddish Brown, DRY, Mostly NPF with little FS. Intermit. Soft Shale beds	
10	6		45 100/5		1.0	0.0	Weathered TOR Spoon Refusal ROC 10-10.5	
12							Chips to 8.0	
14								
16								
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza		Log of Boring No.: SB-23	
BORING LOCATION:		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: Earth Dimension		DATE STARTED: 4/22/20	DATE FINISHED: 4/22/20
DRILLING METHOD: 2¼" HSA		TOTAL DEPTH: 19.0	SCREEN INTERVAL:
DRILLING EQUIPMENT: Diedrich D-120		DEPTH TO WATER: FIRST: 7.0 COMPL.:	CASING:
SAMPLING METHOD: Continous Split Spoon		LOGGED BY:	
HAMMER WEIGHT:	DROP:	RESPONSIBLE PROFESSIONAL:	REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
0	1		7 8 6	15	0.8	6.3	0-0.6 Asphalt Sandy lean clay w/ gravel Grey, mostly LPF, some FS, few FG	
2	2		12 6 8 8	14	1.0	0.7	Slag w/ Fill Grey, moist, mostly MPF, w/ FS wood + Brick	
4	3		14 6 5 7	11	0.9	0.5	0-0.2 As Above w/ concrete 0.2-0.4 Grey, moist, mostly MPF, some FS	
6	4		2 3 4 4	7	1.4	6.3	As Above 0.2-0.9 Transitioning wet 7.0	
8	5		2 1 3 3	4	1.2	1.0	As Above wet	
10	6		4 15 18 16	33	1.4	9.0	Till Brown wet, mostly FS, little MPF, little FG.	
12	7		8 19 28 61	47	1.1	4.1	Above, moist	
14	8		10 31 24 35	55	1.4	5.3	0-1.0 As Above 1.0-1.4 grey, shale	
16	9		9 41 23 22	4	0.8	7.6	0-0.6 Grey, moist, soft shale 0.6-0.8 Brown, moist mostly, Low plasticity Fines some FS	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

15-20 9/10/5

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza	Log of Boring No.: SB-23 cont
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/22/20 — DATE FINISHED: 4/22/20
DRILLING METHOD: 2¼ HSA	TOTAL DEPTH: 19.0 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Dicroch D-120	DEPTH TO WATER: FIRST: 7.0 COMPL.: — CASING: —
SAMPLING METHOD: 2' Continous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
	10		9 10 13		0.8	3.5	Spoon refusal, Weather TOP	Dried to 15.8
20								
4								
6								
8								
10								
12								
14								
16								
18								

Project No: | Benchmark Environmental Engineering & Science, PLLC | Figure

ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South S. Ln Plaza	**Log of Boring No.:** SB-24
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/2x/20 — DATE FINISHED: 4/2x/20
DRILLING METHOD: 2 1/4" HSA	TOTAL DEPTH: 7.0 — SCREEN INTERVAL: —
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: — COMPL.: — CASING:
SAMPLING METHOD: 2' Continuous Split Spoon	LOGGED BY:
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
			26				0-0.6 Asphalt	
	1		24	50	1.0	1.0	0.6-2 Reworked Sand - Stone with Asphalt	
2			24				Till	
			20				Brown moist medium dense SAND, some FS, Few FG, very silty	
	2		16	30	1.3	1.8		
			14					
4			17					
			37				0-0.2 DRY, FG, Brown UP Pile of Gravel	
	3		24	102	0.4	1.9	0.2-0.4 Water TOR 5.5'	
			88					
6			10¾				Weathered TOR	
			35					
	4		10¾		1.0	1.0	7.0 EOB Spoon Refusal	
8								
10								
12								
14								
16								
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK
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SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside Plaza	Log of Boring No.: SB-25
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/22/20 — DATE FINISHED: 4/22/20
DRILLING METHOD: HSA 2¼ Augers	TOTAL DEPTH: 16.0 — SCREEN INTERVAL: —
DRILLING EQUIPMENT: Dietrich D-120	DEPTH TO WATER: FIRST: 4.0' COMPL.: — CASING: —
SAMPLING METHOD: Continuous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: DROP:	RESPONSIBLE PROFESSIONAL: REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
							0.4 Asphalt	
	1		7 8 8	16	1.0	0.1	0-1.0 Sand & gravel Brown, moist, mostly some FS, little FG	
2			19					
	2		7 5 4	12	0.9	0.0	As Above	
4			2					
	3		4 2 2	6	0.6	0.1	As Above wet	
6			1					
	4		4 3 2	7	0.1	0.2	clay mixed w/ gravel	
8			5					
	5		4 5 6	9	0.7	0.6	Brown, wet, Sandy Lean clay, mostly med. w/ FS	
10			3					
	6		4 3 2	6	1.3	0.3	As Above Trace Gravel	
12			4					
	7		5 22 18	40	1.0	0.2	-Till Brown, wet, mostly LPF, some FS, Few FG	
14			16					
	8		8 28 56 31	84	1.5	1.3	As Above EOB 16.0	
16								
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza	Log of Boring No.: SB-26
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/28/20 — DATE FINISHED: 4/28/20
DRILLING METHOD: 2¼" HSA	TOTAL DEPTH: 9.4' — SCREEN INTERVAL:
DRILLING EQUIPMENT: Dic Rich D-120	DEPTH TO WATER: FIRST: 3.0' COMPL.: — CASING:
SAMPLING METHOD: 2' Continous Split Spoon	LOGGED BY:
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							SURFACE ELEVATION (FMSL):	
0							0-0.5 Asphalt — Silty sand	
	1		5 10 9	19	1.0	0.0	0-2 Brown, moist mostly FS, some NPF	
2							Reworked sand + gravel w/ Asphalt 2-3	
	2		14 7 12 19	19	1.5	1.9	3-3.5 Brown, wet silty sand 3.5-4.0 gravelly Till	
4							Till	
	3		38 16 4	46	1.3	0.5	Brown, wet, mostly LPF, some FS, little FG (shale Bed) moist to Dry In shoe	
6								
	4		12 20 33	42	1.6	0.9	Brown, Dry, mostly LPF, Few FS	
8								
	5		37 93 10"/4		1.2	0.2	0.-0.6 As Above 0.6-1.2 Weathered Top	
10							Spoon Refusal 9.4'	
12								
14								
16								
18								

Project No: — Benchmark Environmental Engineering & Science, PLLC — Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Towns Plaza Jamestown, NY	Log of Boring No.: SB-27
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Mec Env	DATE STARTED: 2/21/20 — DATE FINISHED: 2/21/20
DRILLING METHOD: Direct Push	TOTAL DEPTH: 12' — SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe	DEPTH TO WATER: FIRST: 8 COMPL.: — CASING:
SAMPLING METHOD: 4' Core Samples	LOGGED BY: RLD
HAMMER WEIGHT: — DROP: —	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
					1.5'	0	FILL, DRY - Gray SILT / CLAY w/ GRAVEL.	Sampled Interval 4-8'
2								
					1.5	0	As Above	
4								
							Brown Fine SAND w/ Fine GRAVEL Medium Density Wet at 8.5'	
6					3	0.2		
8							8-10' Wet SAND & GRAVEL Saturated	
					2/10	0	10-11' Fine SAND w/ ~~Increasing~~ Increasing CLAY / SILT	
10							11-12' Dense HARD CLAY / SILT - DRY.	
12							Equip Refusal @ 12'	
14								
16								
18								

Project No: | Benchmark Environmental Engineering & Science, PLLC | Figure

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside PARA - Jamestown, NY	**Log of Boring No.:** SB-28
BORING LOCATION: Inside TOPS Store	ELEVATION AND DATUM:
DRILLING CONTRACTOR: TREC ENV	DATE STARTED: 4/21/20 — DATE FINISHED: 4/21/20
DRILLING METHOD: Direct Push	TOTAL DEPTH: — SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe	DEPTH TO WATER: FIRST: 8 — COMPL.: — CASING:
SAMPLING METHOD: 4' core Sampler	LOGGED BY:
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
					1.5'	0	FILL. Dry, grey SILT / CLAY w/ GRAVEL	Spaced 4-8' Interval
2					2'	0	As ABOVE	
4							+/- 6' AS ABOVE	
6					2'	0.2 ppm	6-8' Grey Fine SAND / GRAVEL mix @ 8'.	
8							8-11' Fine SAND w/ Fine GRAVEL Brown ~~Grey~~, wet / Saturated	
10					3'	0		
12							11-12' Grey CLAY/SILT - Dense Slightly moist Equipment REFUSAL @ 12'	
14								
16								
18								

Project No: — Benchmark Environmental Engineering & Science, PLLC — Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South ~~Sales~~ PLAZA SITE - Johnstown, NY	**Log of Boring No.: SB-29**
BORING LOCATION: Indoor SALON	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Tnec Env	DATE STARTED: 4/21/20 — DATE FINISHED: 4/21/20
DRILLING METHOD: Direct Push	TOTAL DEPTH: 11' — SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe	DEPTH TO WATER: FIRST: 8' COMPL.: — CASING:
SAMPLING METHOD: 4' core	LOGGED BY: RLD
HAMMER WEIGHT: / DROP: /	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
					1.5'	0	FILL - Brown clay / sand gravel loose dry	Samples 8-11' Interval
2					2'	0'	As above dry - loose	
4					4/0.3		Brown Fine sand soft w/ Fine Angular gravel moist to wet	
6								
8					4'		8-10' wet/saturated Fine Brown sand w/ Fine Angular gravel	
10							10-11' med sand w/ Fine gravel Increasing Dense Grey clay/silt @ 11' Equipment Refusal @ 11'	
12							PID readings (ppm) -3.9 @ 11' 1.3 @ 9' 1.4 @ 8'	
14								
16								
18								

SURFACE ELEVATION (FMSL):

SAMPLE DESCRIPTION (ASTM D 2488)

USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza	Log of Boring No.: SB-30
BORING LOCATION: Indoor Salon	ELEVATION AND DATUM:
DRILLING CONTRACTOR: TREC Env	DATE STARTED: 4/21/20 — DATE FINISHED: 4/21/20
DRILLING METHOD: Direct Push	TOTAL DEPTH: 16 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Geo probe	DEPTH TO WATER: FIRST: 9' COMPL.: — CASING:
SAMPLING METHOD: Core Samples	LOGGED BY: RLD
HAMMER WEIGHT: — DROP: —	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
0			X	X	1.5'	0	Loose concrete piece) FILL - Course GRAVEL - Brown - DRY	Collect Soil Sample 12-16' Interval
2							AS ABOVE DRY	
4						0	1 FT Recovery - DRY loose (SAND) - Fine w/ course (SAND) GRAVEL	
6						0		
8							3 FT Recovery 8-9' AIR wet	
10				3		0.7	9-12 Fine Brown SAND w/ Fine GRAVEL SOFT, ~~Brown~~ wet/ Saturated)	
12							12-13' Saturated Fine Brown SAND w/ medium GRAVEL - loose	
14				4'	1 Foot Sample	1.1	13-14' - medium SAND w/ Angular GRAVEL - Brown wet	
16							14-16' Increasing silt/clay - Dense - HARD @ 15-16' - DRY	
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza	**Log of Boring No.: MW-15**
BORING LOCATION: MW-15	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/16/20 — DATE FINISHED: 4/16/20
DRILLING METHOD: Continuous Split Spoon	TOTAL DEPTH: 13.0' — SCREEN INTERVAL: 13 – 4.0
DRILLING EQUIPMENT: D-120	DEPTH TO WATER: FIRST: 6.0' COMPL.: — CASING: PVC
SAMPLING METHOD: 2" Split Spoon	LOGGED BY: TAS
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							SURFACE ELEVATION (FMSL):	
0							0-0.9 Asphalt	
1	1		15 21		0.8	0.0	Brown, mostly FS, Few Fine Gravel med Dense	1.0 chips 3 gallons hydro
2	2		7 4 7 9	11	1.4	0.0	Gray, moist, mostly mpF, Som FS Iron staining, Medium Dense	3.0 sand
4	3		7 7 8 6	15	1.6	0.0	As Above Trace FG	4.0
6	4		2 2 3 4	5	0.8	0.0	silty sand Brown, wet, mostly silt, with FS med Dense	
8	5		3 1 3 4	4	0.8	0.0	As ABove	
10	6		10 53 35 23	88	1.2	0.0	Till Brown, wet, mostly FS wi little silt F FG shale Fragments	
12	7		16 16 34 43	50	1.2	0.0	As Above Brown, DRY, mostly NPF, with shale weather TOP? EOB 14.0'	13.0
14							Sampled 4-6	
16								
18								

Project No: — Benchmark Environmental Engineering & Science, PLLC — Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside Plaza	Log of Boring No.: MW-16
BORING LOCATION: MW-16	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/16/20 — DATE FINISHED: 4/17/20
DRILLING METHOD: HSA	TOTAL DEPTH: 16.0 — SCREEN INTERVAL: 16 - 6'
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: 13.0 — COMPL.: — CASING:
SAMPLING METHOD: 2" split spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
0	1		13 16 10		1.2	0.0	0-0.4 Asphalt 0.4-1.0 gravel Subbase 1.0-1.2 Brown, moist, mostly mpF, with some Fs	1.0 Chips
2	2		6 6 5 5	11	1.7	0.0	0-2, Brown, moist, mostly mpF & some Fs, stiff	3 gallon to hydrate
4	3		6 8 8 9	16	1.6	0.0	0-2 As Above Trace sub-rounded gravel	4
6	4		10 11 13 17	24	2.0	1.2	6-8 Grayish Brown to olive Brown SSiG with 5-15% gravel, little sand and clay, stiff 3, (mL-cL)	6
8	5		9 13 13 18	26	2.0	1.7	8-10 Same as 6'-8'	
10	6		51 100/3"		0.2	1.6	10-10.7 Same as 6-8 with occasional cobbles	
12	7		31 24 31 17	55	1.8	5.8	13.0' Brown wet ~~FSG~~, mostly Fs w NPF Few Subrounded FG	
14	8		22 44 40 35	84	1.4	11.0	As Above, Moist	
16							EOB. 16.0' Sampled 14-16 Full list Water @ 8.8' on 4/17/20	16
18								

Project No: — Benchmark Environmental Engineering & Science, PLLC — Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside plaza	Log of Boring No.: MW-17
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/21/20 — DATE FINISHED: 4/21/20
DRILLING METHOD: HSA 4 1/4" Augers	TOTAL DEPTH: 16.0 — SCREEN INTERVAL: 16-6
DRILLING EQUIPMENT: Diedrich D.120	DEPTH TO WATER: FIRST: 7.0 COMPL.: — CASING:
SAMPLING METHOD: Continuous Split Spoon	LOGGED BY:
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
0	1		7 10 9	19	1.0	n.d.	Asphalt 0-0.6 0-0.5 Parking lot sub Base 0.5-1.0 Sandy Lean Clay, Brown mod. wet, some FS	Chips — 1.0
2	2		5 2 3 4	5	0.8	0.5	As Above	
4	3		2 3 3 4	6	1.3	0.3	As Above Trace FG	Sand — 4.0
6	4		3 3 5 5	8	1.6	0.0	As Above Wet @ 7.0'	— 6
8	5		wh 2 5 7	7	1.4	0.5	As Above Trace Shards	
10	6		5 6 6 7	12	1.9	0.0	As Above Brown	
12	7		2 4 11 10	15	1.9	0.1	0-0.5 As Above 0.5-1.9 Till, Brown mod. wet, LPF, some FS, few FG. wet	
14	8		10 20 32 55	52	1.5	0.0	As Above 0.5-1.9	
16							Sample 8-10 BD#1	— 16
18								

Project No: — Benchmark Environmental Engineering & Science, PLLC — Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: Southside Plaza	Log of Boring No.: MW-18X
BORING LOCATION:	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/20/20 — DATE FINISHED: 4/20/20
DRILLING METHOD: 4¼ HSA	TOTAL DEPTH: 17.5 — SCREEN INTERVAL: 16-6
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: 6.0 COMPL.: — CASING:
SAMPLING METHOD: 2" Continuous Split Spoon	LOGGED BY:
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
	1		8 1 16 17	33	0.9	1.4	0-0.6 Asphalt 0-0.9 Brown, moist, mostly MPF, some FS, Trace FG P. Lot Sand Base w/ clay	1.0 Clay
2	2		3 4 24 7	28	1.4	1.5	0-1.1 grey moist, mostly MPF, Some FS Iron mottling 1.1-1.4 concrete rock	
4	3		2 4 5 6	9	1.7	0.8	0-1.7 grey, moist mostly Medium plasticity Fines, some FS, Trace FG.	4.0 Sand
6	4		3 3 3 4	6	1.8	3.5	As Above, Wet	6'
8	5		3 10 8 17	18	1.4	1.0	Till Brown wet, moist MPF, Some FS Few FG.	
10	6		7 9 9 17	14	1.6	1.8	Till Brown, wet, moist MPF, Some FS Few FG, Angular + Subrounded	
12	7		12 16 16 24	32	0.7	0.4	0-0.7 Till as Above 0.7-1.4 weathered TOR	
14	8		19 25 53 73	78	1.2	7.0	0-1.2 Till, Reddish Brown moist, mostly LPF, Some FS Few FG	
16	9		35 97 100/5		1.5	2.7	0-1.0 As Above, DRY 1.0-1.5 grey Shale weathered TOR EOB 17.5 Spoon Refusal Sample (16-16) Full Liner	16
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza	Log of Boring No.: MW-19
BORING LOCATION: MW-19	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Earth Dimensions	DATE STARTED: 4/21/20 — DATE FINISHED: 4/21/20
DRILLING METHOD: 4¼ HSA	TOTAL DEPTH: 16.0 — SCREEN INTERVAL: 16-6
DRILLING EQUIPMENT: Diedrich D-120	DEPTH TO WATER: FIRST: 6.0 COMPL.: — CASING:
SAMPLING METHOD: 2' Continuous Split Spoon	LOGGED BY: TAB
HAMMER WEIGHT: — DROP:	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
							USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 5-10% Few, 15-25% Little, 30-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive), Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	
							SURFACE ELEVATION (FMSL):	
0	1		10 5 4	15	0.5	0.0	0 - 0.4 Asphalt Brown, Moist, mostly LPF, some FS, with FG, Poorly Sub-base	1.0 — chips
2	2		3 3 4 5	7	1.3	0.0	Sandy lean clay, grey moist mostly MPF some FS, Peat, Brown, moist mostly LPF, with some FS and Organics	4.0 — sand
4	3		3 3 6 5	8	1.2	0.1	0-0.6 peat / Topsoil 0.6-1.2 Sandy lean clay as Above	
6	4		3 2 2 3	14	1.1	0.0	grey, wet, mostly, MPF, Some FS Iron staining	6.0
8	5		1 1 2 4	3	1.2	0.5	As Above	
10	6		16 11 17 31	28	1.3	2.1	Fill Brown, Mostly LPF, Some FS, Few FG Angular - sub	
12	7		26 15 18 42	33	1.3	3.1	As Above	
14	8		32 31 31 33	62	1.4	2.9	As Above	
16							EOB 16.0'	16
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: ~~South~~ South Fork PH21 - Smoothie	**Log of Boring No.:** MW-20
BORING LOCATION: Indoor Salon	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Thew Env	DATE STARTED: 4/21/20 — DATE FINISHED: 4/21/20
DRILLING METHOD: Direct Push	TOTAL DEPTH: 14 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe	DEPTH TO WATER: FIRST: 8' — COMPL.: — CASING:
SAMPLING METHOD: 4 FT. Core Samples	LOGGED BY: RWD
HAMMER WEIGHT: — DROP: —	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
0					2'	0	FILL - Brown clay/ Red GRAVEL dry, med Dense slightly moist @ 2'	Sample 8-12' Interval
2					2'	0	As Above	
4					4	0	~~Brown clay w/ TRACE Fine GRAVEL slightly moist~~ Brown Sandy clay/silt w/ Fine GRAVEL Low Dense moist from 6-8'	
8					4	0.2 ppm	Fine Sandy/clay Saturated w/ Fine Angular GRAVEL SOFT Grey/Brown.	
10							Equipment Refusal @ 13.2'	
12							Set 1" dia monitoring well w/ 10' screen.	
14								
16								
18								

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: South Side Plaza - Jamestown, NY	Log of Boring No.: MW-21
BORING LOCATION: Inside Salon	ELEVATION AND DATUM:
DRILLING CONTRACTOR: TREC ENV	DATE STARTED: 4/21/20 — DATE FINISHED: 4/21/20
DRILLING METHOD: Direct Push	TOTAL DEPTH: 12 — SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe	DEPTH TO WATER: FIRST: 6 — COMPL.: — CASING:
SAMPLING METHOD: 4' Single cores	LOGGED BY:
HAMMER WEIGHT: / — DROP: /	RESPONSIBLE PROFESSIONAL: — REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (ASTM D 2488)	REMARKS
					1.5'	0	FILL- Brown CLAY/SAND & GRAVEL loose DRY	Sample 8-12' Interval
2					1.5'	0	As ABOVE	
4					4'	0.2 @ 6'	4-6' Fine SAND- Brown w/ Fine GRAVEL soft moist to wet @ 6'	
6							6-8' Fine SAND wet w/ Fine GRAVEL Increasing CLAY/SILT @ 8'	
8						0.3	8-11. med SAND & GRAVEL ~~SAND~~, wet,	
10							11-12 SOFT CLAY/SILT - moist	
							Equipment REFUSAL @ 12'	
12							Installed 1" dia monitoring well w/ 8' Screen	
14								
16								
18								

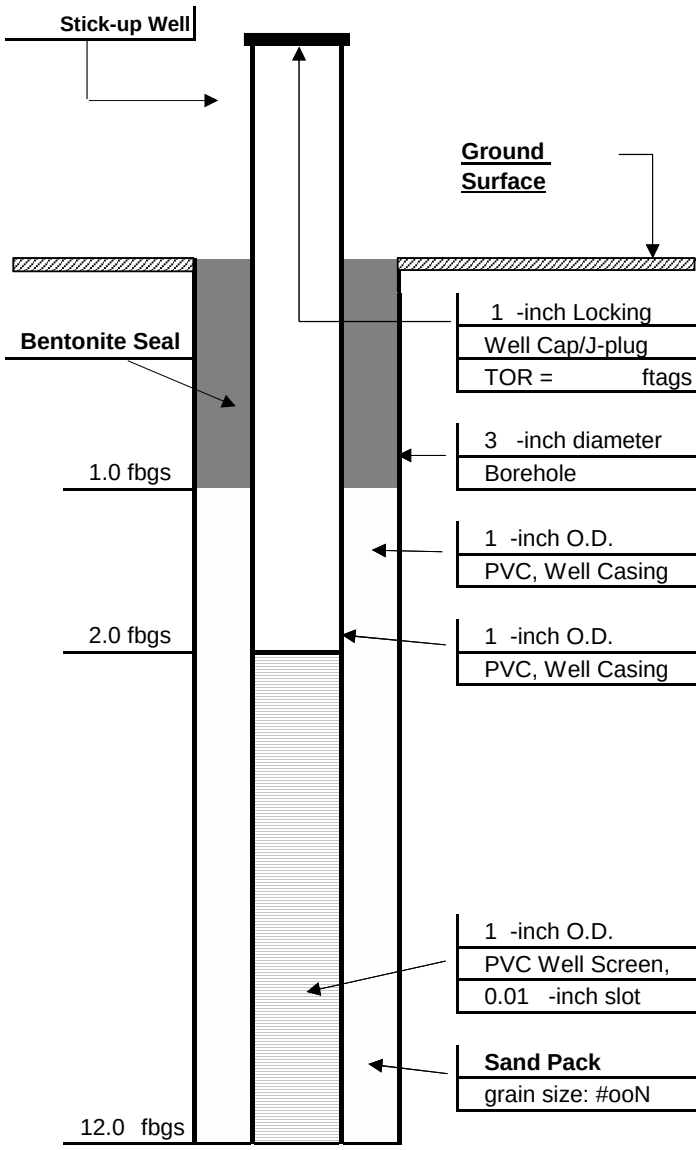
SURFACE ELEVATION (FMSL):

Project No:	Benchmark Environmental Engineering & Science, PLLC	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

STICK-UP MONITORING WELL COMPLETION DETAIL

Project Name:	**Southside Plaza RI**	WELL NUMBER:	**TW-1**
Client:	**Kazmarek Mowrey Cloud Laseter, LLP**	Date Installed:	**04/21/20**
Location:	**Jamestown NY**	Project Number:	**B0505-019-001**



Driller Information

Company:	Trec Environmental
Driller:	Jim A.
Helper:	NA
Drill Rig Type:	Geoprobe 54LT

Well Information

Land Surface Elevation:			fmsl (approximate)
Drilling Method:	Direct Push		
Soil Sample Collection Method:	NA		
Drilling Fluid:	NA		
Fluid Loss During Drilling:	NA		gallons (approximate)

Material of Well Construction

Casing:	PVC
Screen:	PVC
Sump:	none
Sand Pack:	#oon
Annular Seal:	bentonite crumbles

Groundwater Quality

Water Level:	10.15	1 Volume:	0.10 gallons
Bottom Depth:	12.83	Purged:	0.50 gallons
Ph:	7		
Temp	6.5	Sample Time:	###
Cond:	###	Analysis:	TCL+TICS VOC 8260
Turb:	<1000		
DO:	3.3		
ORP:	-41		
Apperance:	brown sed		
odor:	no odor		

Comments: saturated thickness: SWL - stickup = -0.83 fbgs

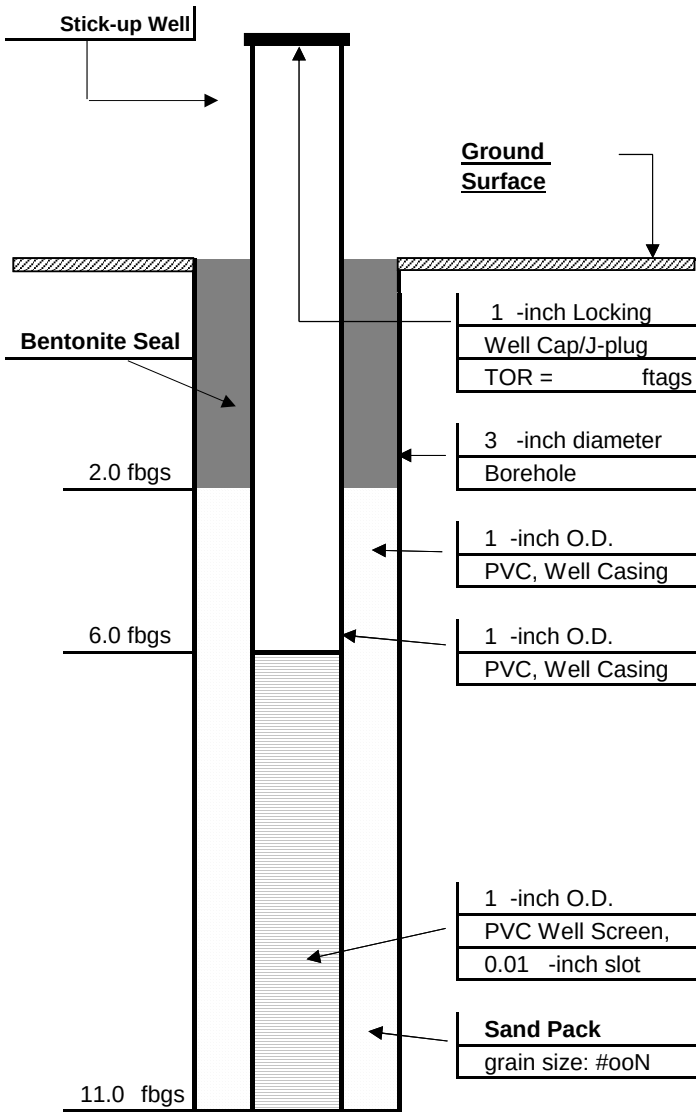
Total Depth =	12.83	fbTOR	Total Depth - SWL =	12.83	feet
stick-up =	0.83	feet			
Total Depth =	12.00	fbgs			

PREPARED BY: TAB DATE: 04/21/20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

STICK-UP MONITORING WELL COMPLETION DETAIL

Project Name:	**Southside Plaza RI**	WELL NUMBER:	**TW-2**
Client:	**Kazmarek Mowrey Cloud Laseter, LLP**	Date Installed:	**04/21/20**
Location:	**Jamestown NY**	Project Number:	**B0505-019-001**



Driller Information

Company:	Trec Environmental
Driller:	Jim A.
Helper:	NA
Drill Rig Type:	Geoprobe 54LT

Well Information

Land Surface Elevation:			fmsl (approximate)
Drilling Method:	Direct Push		
Soil Sample Collection Method:	NA		
Drilling Fluid:	NA		
Fluid Loss During Drilling:	NA		gallons (approximate)

Material of Well Construction

Casing:	PVC
Screen:	PVC
Sump:	none
Sand Pack:	#oon
Annular Seal:	medium bentonite chips

Groundwater Quality

Water Level:	6.71	1 Volume:	0.23	gallons
Bottom Depth:	11.98	Purged:	0.75	gallons
Ph:	7.7			
Cond:	###	Sample Time:	###	
Turb:	<1000	Analysis:	TCL+ TICS VOC 8260	
DO:	3			
ORP:	-47			
Apperance:	Brown Sed			
odor:	none			

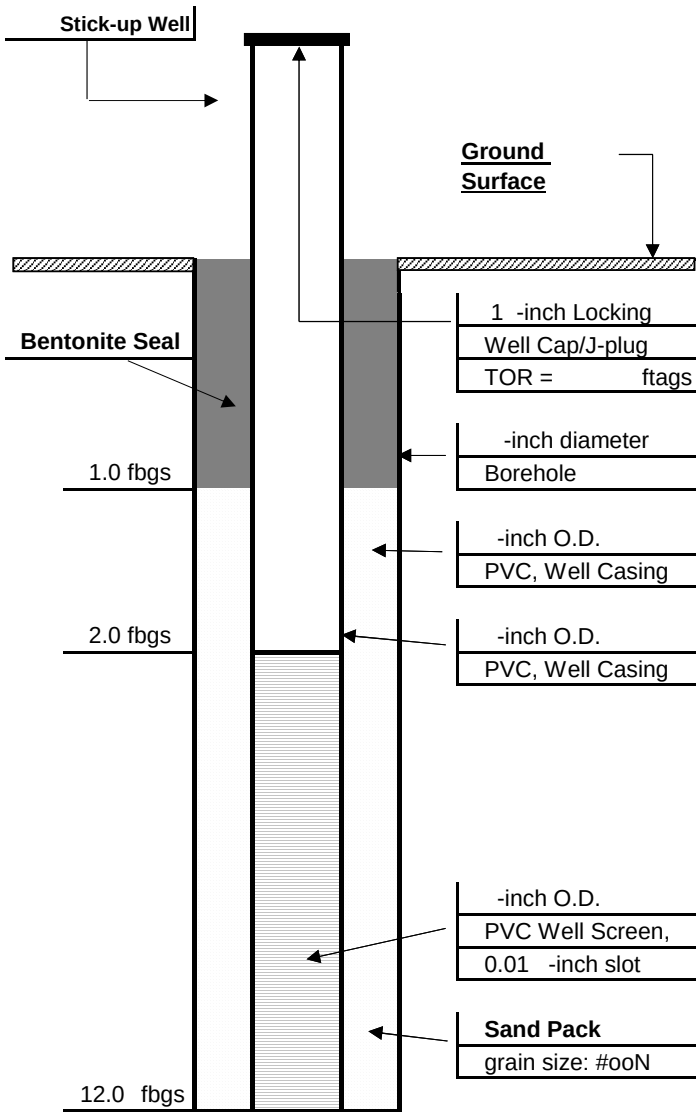
Comments:			saturated thickness:	SWL - stickup =	-0.98 fbgs
Total Depth =	11.98	fbTOR		Total Depth - SWL =	11.98 feet
stick-up =	0.98	feet			
Total Depth =	11.00	fbgs			

PREPARED BY: TAB DATE: 04/21/20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

STICK-UP MONITORING WELL COMPLETION DETAIL

Project Name:	**Southside Plaza RI**	WELL NUMBER:	**TW-3**
Client:	**Kazmarek Mowrey Cloud Laseter, LLP**	Date Installed:	**04/21/20**
Location:	**Jamestown NY**	Project Number:	**B0505-019-001**



Driller Information

Company:	Trec Environmental
Driller:	Jim A.
Helper:	NA
Drill Rig Type:	Geoprobe 54LT

Well Information

Land Surface Elevation:			fmsl (approximate)
Drilling Method:	Direct Push		
Soil Sample Collection Method:	NA		
Drilling Fluid:	NA		
Fluid Loss During Drilling:	NA		gallons (approximate)

Material of Well Construction

Casing:	PVC
Screen:	PVC
Sump:	none
Sand Pack:	#oon
Annular Seal:	medium bentonite chips

Groundwater Quality

Water Level:	8.95	1 Volume:	0.17 gallons
Bottom Depth:	13.13	Purged:	0.5 gallons
Ph:	7.6		
Cond:	###	Sample Time:	###
Turb:	<1000	Analysis:	TCL+ TICS VOC 8260
DO:	7.9		
ORP:	-16		
Apperance:	Brown Sed		
odor:	none		

Comments: saturated thickness: SWL - stickup = -1.30 fbgs

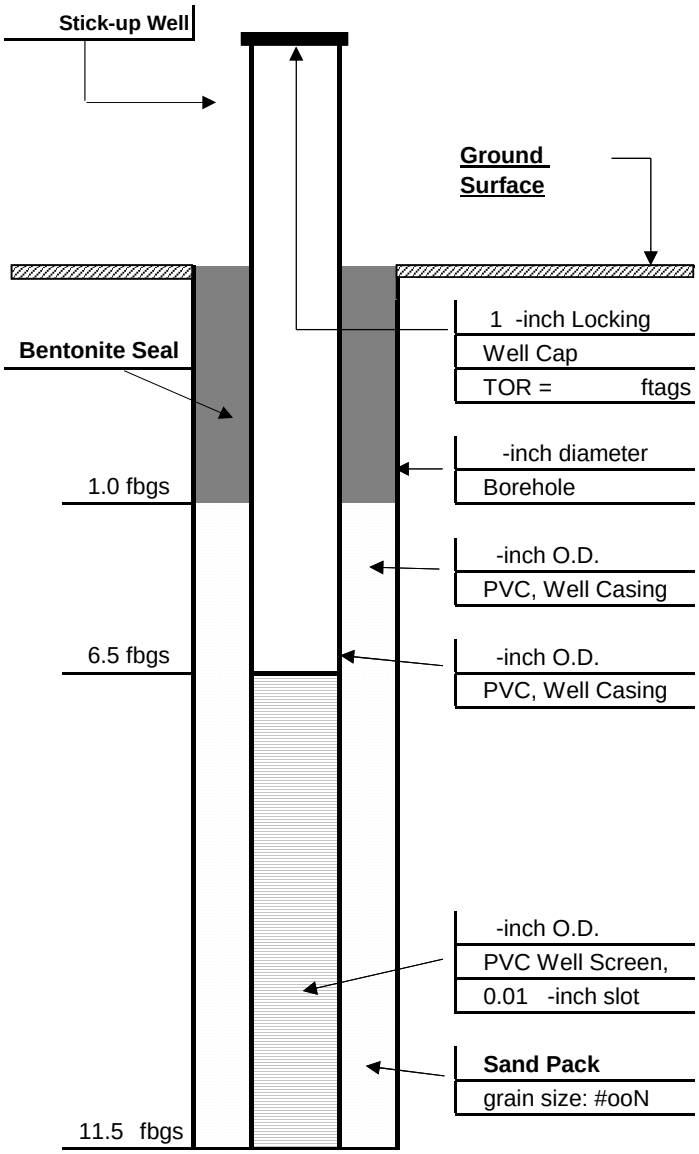
Total Depth =	12.00	fbTOR	Total Depth - SWL =	12.00	feet
stick-up =	1.3	feet			
Total Depth =	10.70	fbgs			

PREPARED BY: TAB DATE: 04/21/20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

STICK-UP MONITORING WELL COMPLETION DETAIL

Project Name:	**Southside Plaza RI**	WELL NUMBER:	**TW-4**
Client:	**Kazmarek Mowrey Cloud Laseter, LLP**	Date Installed:	**06/05/20**
Location:	**Jamestown NY**	Project Number:	**B0505-019-001**



Driller Information

Company:	Trec Environmental
Driller:	Chris
Helper:	NA
Drill Rig Type:	Geoprobe 66DT

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	Direct Push	
Soil Sample Collection Method:	NA	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	PVC
Screen:	PVC
Sump:	none
Sand Pack:	#oon
Annular Seal:	medium bentonite chips

Groundwater Quality

Water Level:	8.21	1 Volume:	0.13	gallons
Bottom Depth:	11.48	Purged:	0.26	gallons
Ph:	7.81			
Cond:	1733	Sample Time:	1239	
Turb:	<1000	Analysis:	TCL+ TICS VOC 8260	
DO:	5.45			
ORP:	40			
Apperance:	Brown Sed			
odor:	none			

Notes: Well purged dry after 0.26 gallons.

Comments:			saturated thickness:	SWL - stickup =	-0.20 fbgs
Total Depth =	11.50	fbTOR		Total Depth - SWL =	11.50 feet
stick-up =	0.2	feet			
Total Depth =	11.30	fbgs			

PREPARED BY: TAB DATE: 06/05/20

APPENDIX D

GROUNDWATER FIELD LOGS AND SLUG TEST RESULTS

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE D-1

GROUNDWATER FIELD PARAMETERS

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
SOUTHSIDE PLAZA SITE
JAMESTOWN, NEW YORK

Well ID	Date Sampled	pH	Temp (deg C)	Specific Conductivity (uS)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	ORP (mV)
MW-1	5/6/2020	7.10	11.0	4,199	36.6	1.14	11
MW-2	5/6/2020	6.99	11.2	1,510	56.1	1.61	24
MW-3	5/7/2020	7.11	10.2	2,648	32.2	1.17	70
MW-4	5/4/2020	6.42	7.7	260.3	N/A	2.49	76
MW-5	5/5/2020	7.05	11.9	2,901	29.9	1.2	88
MW-6	5/6/2020	7.32	9.8	1,320	15.9	1.51	92
MW-7	5/5/2020	6.52	10.1	616.1	199	1.75	103
MW-8	5/6/2020	7.50	10.9	650	464	1.2	93
MW-9	5/4/2020	6.93	9.9	237	N/A	7.15	63
MW-10A	5/5/2020	7.20	9.0	1,190	136	1.8	93
MW-11	5/5/2020	7.48	10.6	549.8	406	2.7	79
MW-12	5/7/2020	7.32	14.8	618.2	326	2.85	56
MW-13	5/7/2020	7.50	16.5	882.4	170	2.28	60
MW-14	5/7/2020	7.00	17.7	620.8	311	3.2	84
MW-15	5/5/2020	7.21	10.9	801.2	618	2.47	82
MW-16	5/6/2020	7.06	12.2	5,642	<1,000	5.17	94
MW-17	5/5/2020	6.95	12.1	2,871	<1,000	1.69	3
MW-18	5/7/2020	7.19	11.0	3,201	<1,000	2.62	113
MW-19	5/6/2020	7.08	10.8	3,564	104	1.83	50
MW-20	5/4/2020	7.22	16.1	919.9	<1,000	1.56	59
MW-21	5/4/2020	7.66	15.8	1,219	<1,000	4.64	127

GROUNDWATER FIELD FORM

Project Name: South Side Plaza — Date: 4-23-20

Location: Jamestown, NY — Project No.: — Field Team: CFO

Well No. MW-5	Diameter (inches): 2"	Sample Date / Time: 1030 4-22
Product Depth (fbTOR): -	Water Column (ft): 10.07	DTW when sampled:
DTW (static) (fbTOR): 9.01	One Well Volume (gal): 1.6 gal	Purpose: ☒ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 19.08	Total Volume Purged (gal): 6.6 gal	Purge Method:

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1030	0	Initial	-	7.46	9.3	3810	81.1	10.49	169	Clearish - Mus
	1	9.15	1.7	7.09	9.5	3100	634	10.53	178	Grey Turbid, M
	2	9.27	3.5	7.08	9.6	3209	NA	3.14	191	Turbid, Cloudy - Light Pour
	3	9.30	5.0	7.09	9.7	3219	NA	3.80	192	Turbid, Light Musty Odor
	4	9.30	6.6	7.06	9.8	3275		2.53	185	"
	5	9.25	8.2	7.09	10.0	3337		5.16	187	Dark Brown, Turbid, No Odor
	6	9.12	10.0	7.09	10.0	3188		5.53	188	"
	7									
	8									
	9									
	10									

Sample Information:

	S1									
	S2									

Well No. MW-16	Diameter (inches): 2"	Sample Date / Time: 1230 4-22
Product Depth (fbTOR):	Water Column (ft): 7.51	DTW when sampled:
DTW (static) (fbTOR): 7.42	One Well Volume (gal): 1.22	Purpose: ☒ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 14.93	Total Volume Purged (gal): 12.3 gal	Purge Method:

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1230	0	Initial	-	7.15	10.3	5369	953	9.49	215	Dark Brown/Gr
1235	1	7.63	1.3	7.12	10.3	5237	NA	9.34	227	Thick Dark Brown - Chocolate
1240	2	7.60	2.6	7.10	10.3	5242		7.39	214	"
1245	3	8.20	3.8	7.09	10.4	5250		5.57	202	"
1250	4	8.91	5.0	7.05	10.5	5223		5.20	176	" No Odor
1255	5	9.34	6.3	7.14	10.8	5179		5.92	174	Very Thick Brown, Light Petro
1300	6	9.8	7.5	7.22	11.1	4896		6.22	172	"
1305	7	11.4	8.7	7.20	11.1	5259		6.69	154	"
1310	8	11.8	10.0	7.09	11.4	5459		2.91	135	"
1320	9	10.4	11.2	7.10	12.0	5739		4.61	159	
1330	10	10.9	12.3	7.10	12.1	5646		4.68	98	Very Brown, Slight Odor - Turbid

Sample Information:

	S1									
	S2									

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

GROUNDWATER FIELD FORM

Project Name: South Side Pizza
Location: Jamestown, NY
Project No.:
Date: 4-23-20
Field Team: CFD

Well No. MW-15			Diameter (inches): 2"			Sample Date / Time: 1400 4-23			
Product Depth (fbTOR): -			Water Column (ft): 5.83			DTW when sampled:			
DTW (static) (fbTOR): 6.4			One Well Volume (gal): 1.0			Purpose: ☒ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 12.23			Total Volume Purged (gal): 10.0			Purge Method: BAILER			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1400	0 Initial	-	7.06	10.1	813.2	579	3.16	246	CLOUDY, CLOUDY - NO ODOR
1405	1 6.27	1	7.24	10.2	886.7	NA	3.20	248	BROWN, NO ODOR
1410	2 6.5	2	7.24	10.4	919.8		3.23	253	THICK BROWN, LIGHT SULFUR ODOR
1415	3 6.5	3	7.25	10.5	927.3		4.02	257	"CHOCOLATE MILK"
1420	4 6.62	4	7.27	10.8	954.4		3.89	250	THICK BROWN, LIGHT ODOR
1425	5 6.60	5	7.33	11.1	920.9		3.62	249	〃
1430	6 6.58	6	7.33	11.2	895.4		3.49	262	
1435	7 6.55	7	7.34	10.8	870		3.07	278	
1440	8 6.6	8	7.34	10.8	869.4		3.37	270	
1445	9 6.67	9	7.34	10.2	867.5		3.49	251	
1450	10 6.58	10	7.34	9.9	879.6	↓	4.20	254	THICK BROWN, NO ODOR
Sample Information:									
	S1								
	S2								

Well No. MW-18			Diameter (inches): 2"			Sample Date / Time: 1515 4-23-20			
Product Depth (fbTOR): -			Water Column (ft): 8.16			DTW when sampled:			
DTW (static) (fbTOR): 5.19			One Well Volume (gal): 1.3			Purpose: ☒ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 13.35			Total Volume Purged (gal): 13.3 gal			Purge Method: Bailer			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1510	0 Initial	-	7.50	12.4	2573	NA	4.68	4	CLOUDY BROWN TURBID, SLIGHT ODOR
1515	1 6.4	1.3	7.53	10.7	2653		3.51	-144	BROWN TURBID, NO ODOR
1520	2 7.62	2.6	7.50	10.4	2845		3.20	-156	THICK - CHOC. MILK
1525	3 8.34	4.0	7.48	10.1	2921		3.08	-179	THICK BROWN, NO ODOR
1530	4 10.10	5.3	7.40	10.2	3120		2.88	-184	
1550	5 9.75	6.6	7.37	10.0	3450		2.76	-190	
1600	6 11.20	8.0	7.36	10.4	3514		2.80	-172	
1605	7	9.3	7.34	10.4	3572		2.83	-158	
	8	10.5	7.34	10.1	3588		2.81	-154	
	9	12.0	7.33	10.0	3614			-149	
	10	13.3	7.32	9.9	3622	↓	2.77	-148	THICK BROWN, SLIGHT ODOR
Sample Information:									
	S1								
	S2								

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

GROUNDWATER FIELD FORM

Project Name: SOUTH SIDE PLAZA — Date: 4-23-20

Location: JAMESTOWN, NY — Project No.: — Field Team: CFP

Well No. MW-17 | Diameter (inches): | Sample Date / Time: 1625 4-23

Product Depth (fbTOR): – | Water Column (ft): 8.4 | DTW when sampled:

DTW (static) (fbTOR): 6.73 | One Well Volume (gal): 1.3 | Purpose: ☒ Development ☐ Sample ☐ Purge & Sample

Total Depth (fbTOR): 15.13 | Total Volume Purged (gal): 13.0 | Purge Method: Bailer

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1625	0	Initial	–	7.29	11.7	1624	NA	3.51	75	DARK GREY/BROWN
	1	7.12	1.3	7.30	11.5	1714		3.77	51	LIGHT BROWN
	2	7.27	2.6	7.31	11.2	1872		4.16	87	THICK BROWN / NO ODOR
	3	7.49	3.9	7.30	11.2	1950		4.08	124	
	4	7.89	5.2	7.30	11.0	2300		3.92	157	
	5	8.27	6.5	7.29	11.1	2107		3.67	78	
	6	8.52	7.8	7.26	11.1	1903		3.51	41	
	7	8.77	9.1	7.30	11.0	1673		3.71	41	
	8	8.9	10.4	7.32	11.3	1544		3.95	40	
	9		11.7	7.36	11.2	1477		4.27	38	
1715	10		13.0	7.40	11.1	1401		4.84	37	THICK BROWN / NO ODOR

Sample Information:

S1	
S2	

Well No. MW-8 | Diameter (inches): 2" | Sample Date / Time: 4-24-20 0905

Product Depth (fbTOR): – | Water Column (ft): 12.5 | DTW when sampled:

DTW (static) (fbTOR): 4.02 | One Well Volume (gal): 2.0 | Purpose: ☒ Development ☐ Sample ☐ Purge & Sample

Total Depth (fbTOR): 16.52 | Total Volume Purged (gal): 8 gal | Purge Method: Bailer

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
0905	0	Initial	–	7.44	10.0	757.5	428	2.70	284	GRAY, CLOUDY TURBID / NO ODOR
0915	1	4.03	2	7.61	9.9	680.9	NA	4.65	277	GREY TURBID, MUSTY ODOR
0925	2	4.00	4	7.64	10.4	674.4		10.15	264	GREY TURBID
0935	3	4.05	6	7.63	11.0	743.9		3.37	260	
0945	4	4.01	8	7.57	11.1	7166		3.16	250	GREY TAN TURBID - NO ODOR
	5									
	6									
	7									
	8									
	9									
	10									

Sample Information:

S1	
S2	

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

GROUNDWATER FIELD FORM

Project Name: SOUTH SIDE PLAZA - JAMESTOWN Date: 4-24-20

Location: JAMESTOWN, NY Project No.: Field Team: CFD

Well No. MW-20	Diameter (inches): 1"	Sample Date / Time: 1030 4-24-20
Product Depth (fbTOR): -	Water Column (ft): 5.55	DTW when sampled:
DTW (static) (fbTOR): 4.9	One Well Volume (gal): 0.23	Purpose: ☒ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 10.45	Total Volume Purged (gal): 2.3	Purge Method: PARASTALTIC PUMP

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1030	0	Initial	-	7.47	11.1	1120	NA	8.39	-289	TAN TURBID
	1		0.23	7.31	11.4	1022		5.69	-207	NO ODOR
	2		0.46	7.19	14.3	904.7		6.84	-181	
	3		0.75	7.20	17.7	999.		5.34	-182	
	4		1.75	7.20	15.4	900.7		4.19	-188	
	5		1.75	7.21	15.6	901.4		3.61	-190	
	6		2.25	7.22	15.5	898.3		2.89	-187	
	7		2.4	7.21	16.0	903		2.49	-209	TAN BROWN TURBID
	8								-244	NO ODOR
	9									
	10									
Sample Information:										
	S1									
	S2									

Well No. MW-21	Diameter (inches): 1"	Sample Date / Time: 1135 4-24-20
Product Depth (fbTOR): -	Water Column (ft): 2.83	DTW when sampled:
DTW (static) (fbTOR): 3.6	One Well Volume (gal): 0.12	Purpose: ☒ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 6.43	Total Volume Purged (gal): 1.2	Purge Method: PARASTALTIC PUMP

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1135	0	Initial	-	7.79	16.1	1294	NA	5.69	-250	THICK BROWN - NO ODOR
1140	1		0.15	7.61	16.3	1381		8.74	-180	"CHOCOLATE" MILK
1145	2		0.30	7.67	16.3	1336		7.39	-211	BROWN TURBID - 'DIRT' ODOR
1150	3		0.45	7.68		1292		6.89	-184	
1155	4		0.55	7.74		1212		6.11	-217	SANDY
1200	5		0.70	7.80		1188		4.34	-266	
1210	6		0.85	7.93	16.4	1115		4.24	-142	
1215	7		1.00	7.67	16.5	1170		3.58	-97	TAN BROWN
1220	8		1.25	7.69	16.4	1166		5.46	-78	SANDY - 'DIRT' ODOR
	9									
	10									
Sample Information:										
	S1									
	S2									

REMARKS: * INSIDE SALON

MW 20 + MW 21 → BOTH BECAME TO GO DRY, BUT SLOWLY RECHARGED

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: CFD

GROUNDWATER FIELD FORM

Project Name: South Side Plaza
Location: Jamestown, NY
Project No.:
Date: 4-24-20
Field Team: CFD

Well No. MW-19	Diameter (inches): 2"	Sample Date / Time: 1440	4-24-20
Product Depth (fbTOR): –	Water Column (ft): 9.43"	DTW when sampled:	
DTW (static) (fbTOR): 5.72	One Well Volume (gal): 1.5 GAL	Purpose: ☒ Development ☐ Sample ☐ Purge & Sample	
Total Depth (fbTOR): 15.15	Total Volume Purged (gal): 15 GAL	Purge Method: Bailer	

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1440	0	Initial	–	7.28	10.6	2414	371	6.37	222	Clear - Light Cloudy
1445	1	5.75	1.5	7.25	12.0	2074	814	5.24	178	No odor
1450	2	5.84	3.0	7.22	11.8	3115	NA	4.34	154	Brown Turbid
1455	3	5.92	4.5	7.15	11.7	3369		5.00	154	No odor
1500	4	6.10	6.0	7.15	12.0	3369		5.25	155	
1520	5	6.25	7.5	7.16	11.5	3365		5.07	154	
1515	6	6.47	9.0	7.18	11.3	3361		4.38	155	
1520	7	6.49	10.5	7.20	11.0	3354		4.64	156	Dark Brown / Light Red
1540	8	5.74	12.0	7.03	11.1	3136		6.16	156	
1545	9	5.80	13.5	7.28	11.3	3233		6.06	176	
1550	10	6.15	15.0	7.32	11.1	3245		5.55	178	Grey Tan / No odor

Empty Bucket

Sample Information:

	S1									
	S2									

Well No. MW-6	Diameter (inches): 2"	Sample Date / Time: 4-24-20	1324
Product Depth (fbTOR): –	Water Column (ft): 11.73	DTW when sampled:	
DTW (static) (fbTOR): 3.85	One Well Volume (gal): 1.9	Purpose: ☐ Development ☐ Sample ☐ Purge & Sample	
Total Depth (fbTOR): 16.58	Total Volume Purged (gal): 8.0 GAL	Purge Method:	

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1325	0	Initial	–	7.39	11.6	1848	625	1.92	239	Cloudy Cloudy - No odor
1330	1	3.87	2.0	7.25	11.4	1842	778	2.36	256	Grey Turbid,
1340	2	3.95	4.0	7.36	11.2	1572	877	2.46	271	" Black Floaties
1350	3	3.99	6.0	7.37	11.1	1524	NA	1.90	281	Tan Cloudy Turbid
1400	4	4.0	8.0	7.38	11.2	1520		1.93	285	Brown Turbid
	5									Black Particulates
	6									No odor
	7									
	8									
	9									
	10									

Sample Information:

	S1									
	S2									

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: CFD

GROUNDWATER FIELD FORM

Project Name: South Side Plaza — Date: 4-27-20

Location: Jamestown, NY — Project No.: — Field Team: CFD

Well No. MW-3			Diameter (inches): 8"			Sample Date / Time: 4-24-20 1105			
Product Depth (fbTOR): -			Water Column (ft): 8.12 est			DTW when sampled:			
DTW (static) (fbTOR): 4.96			One Well Volume (gal): 1.3 est			Purpose: ☒ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 13.08			Total Volume Purged (gal): 6.5 est			Purge Method: Bailer			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1105	0 Initial	-	10.15	12.4	2338	348	1.36	-62	Clear, Light Cloudy
1115	1 5.10	1.3	8.69	12.2	2478	346	1.96	-91	Clear, Cloudy, Chem odor
1120	2 5.35	2.6	6.97	11.4	2457	268	1.76	-69	"
1130	3 5.47	4.0	6.98	10.4	2462	187	1.72	-70	"
1140	4 5.70	5.3	7.01	10.1	2471	269	1.64	-84	Cloudy, Chem odor
1150	5 5.77	6.5	7.03	10.0	2478	315	1.60	-94	"
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

Well No. MW-11			Diameter (inches): 2"			Sample Date / Time: 4-24-20 0930			
Product Depth (fbTOR): -			Water Column (ft): 7.2			DTW when sampled:			
DTW (static) (fbTOR): 3.10			One Well Volume (gal): 1.17			Purpose: ☒ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 10.30			Total Volume Purged (gal): 5.5			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
0930	0 Initial	-	7.09	12.0	620.9	880	3.53	276	Cloudy / Gray Turbid
0940	1 3.4	1.3	7.53	11.4	1050.5	NA	3.61	265	Tan Gray Turbid
0960	2 3.10	2.6	7.55	11.4	592.6	|	3.67	267	" Musty odor
1000	3 3.12	4.0	7.56	11.0	590.6	|	3.69	263	
1010	4 3.14	5.5	7.58	10.8	595.4	|	3.64	261	Brown Turbid Musty odor
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: CFD

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: South side plaza

Project No.: B0505-019 - 001

Client:

Date: 5/4/20

Instrument Source: ☒ BM ☐ Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
☒ pH meter	units	900	Myron L Company Ultra Meter 6P	6213516 ☐ 6243084 ☒ 6212375 ☐ 6243003 ☐ 6223973 ☐	TAB	4.00	3.96	4.0
						7.00	7.02	7.00
						10.01	9.97	10.0
☒ Turbidity meter	NTU	900	Hach 2100P or 2100Q Turbidimeter	06120C020523 (P) ☐ 13120C030432 (Q) ☐ 17110C062619 (Q) ☒	SAB	10 NTU verification	9.83	10.0
						< 0.4		
						20		
						100		
						800		
☒ Sp. Cond. meter	uS mS	900	Myron L Company Ultra Meter 6P	6213516 ☐ 6243084 ☒ 6212375 ☐ 6243003 ☐ 6223973 ☐	TAB	7.00 mS @ 25 °C	6,949	7.00
☐ PID	ppm		MinRAE 2000			open air zero		MIBK response factor = 1.0
						____ ppm Iso. Gas		
☒ Dissolved Oxygen	ppm	900	HACH Model HQ30d	080700023281 ☐ 100500041867 ☐ 140200100319 ☒	TAB	100% Satuartion	100% slope	101%
☐ Particulate meter	mg/m³					zero air		
☐ Radiation Meter	uR/H					background area		

ADDITIONAL REMARKS:

PREPARED BY: TAB **DATE:** 5/4/20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Scotts'd Plant 6 GWM Date: 5/4/20

Location: Johnstown NY Project No.: B0505-015-001 Field Team: TAB

Well No. MW-21			Diameter (inches): 1"			Sample Date / Time: 5/4/20 1204			
Product Depth (fbTOR): –			Water Column (ft): 3.33			DTW when sampled: –			
DTW (static) (fbTOR): 3.85			One Well Volume (gal): 0.13			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 7.18			Total Volume Purged (gal):			Purge Method: peristaltic			

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1129	0 Initial	30.25	7.43	14.6	1466	<1000	6.60	169	Brown silt No OL
1143	1 –	0.25	7.68	15.2	1333	<1000	5.62	141	"
1154	2 –	0.30	7.68	14.1	1337	<1000	4.08	137	"
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1204	S1 –	0.50	7.66	15.8	1219	<1000	4.64	127	
1214	S2	0.60	7.61	15.9	1210	<1000	4.24	123	

-0.18

Well No. MW-20			Diameter (inches): 1"			Sample Date / Time:			
Product Depth (fbTOR): –			Water Column (ft): 5.65			DTW when sampled:			
DTW (static) (fbTOR): 5.18			One Well Volume (gal): 0.23			Purpose: ☐ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 10.83			Total Volume Purged (gal):			Purge Method:			

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1300	0 Initial	>0.25	7.64	16.0	899.3	<1000	5.30	46	Turbid No OL
1302	1 –	0.50	7.37	16.0	938.0	<1000	3.33	41	"
1304	2 –	0.75	7.21	16.0	972.4	<1000	2.01	57	"
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1309	S1 –	1.25	7.22	16.1	919.9	<1000	1.56	59	"
1317	S2 –	1.50	7.23	16.0	913.7	<1000	1.87	55	"

-.20

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: THB

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: South side Plaza Date: 5/4/20

Location: James Town Project No.: B505-015-001 Field Team: JA3/Clt

Well No. MW-9			Diameter (inches): 2.00			Sample Date / Time: 5-4-20 / 1422			
Product Depth (fbTOR): —			Water Column (ft): 8.17			DTW when sampled: 4.81			
DTW (static) (fbTOR): 4.81			One Well Volume (gal): 1.33			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 12.38			Total Volume Purged (gal): 4.00			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1407	0 Initial	0.00	8.56	10.3	237.0	>1000	7.40	53	Turbid.
1409	1 4.65	0.50	7.70	10.1	234.4		7.25	50	SL Turbid
1411	2 4.65	0.75	7.43	10.0	247.9		7.05	51	SL Turbid
1415	3 4.70	1.00	7.16	10.1	252.8		7.05	55	" "
1417	4 4.71	1.75	7.00	10.1	240.4		7.01	57	" "
1419	5 4.75	2.50	6.98	10.0	237.0		7.21	59	Clear
1420	6 4.76	3.00	6.96	9.9	237.0		7.10	61	Clear
	7								
	8								
	9								
	10								
Sample Information:									
1422	S1 4.81	3.50	6.93	9.9	237.0		7.15	63	Clear
1424	S2 4.91	4.00	6.90	9.9	237.0		7.13	64	Clear

Well No. MW-4			Diameter (inches): 2			Sample Date / Time: 5-4-20 / 1510			
Product Depth (fbTOR):			Water Column (ft): 4.89			DTW when sampled: 6.34'			
DTW (static) (fbTOR): 5.78			One Well Volume (gal): 0.80			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 10.67			Total Volume Purged (gal): 3.75			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1456	0 Initial	0.00	6.83	8.4	251.9		2.91	57	SL Turbid
1457	1 6.11	0.25	6.81	7.6	240.7		3.20	56	Clear
1459	2 6.20	0.75	6.77	7.5	246.2		3.16	59	Clear
1501	3 6.25	1.25	6.73	7.5	250.2		3.19	64	Clear
1503	4 6.29	1.75	6.48	7.6	254.6		2.56	72	Clear
1504	5 6.31	2.25	6.45	7.6	255.7		2.41	75	Clear
1507	6 6.33	2.50	6.45	7.6	257.3		2.40	75	Clear
	7								
	8								
	9								
	10								
Sample Information:									
1510	S1 6.34	3.00	6.42	7.7	260.3		2.49	76	Clear
1521	S2 6.43	3.75	6.48	7.9	268.7		2.33	77	Clear

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: JA3

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:
Project Name: Southside Plaza Jamestown
Project No.: B0505-019-001
Client:

Date: 5/5/20

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	900	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [X] 6212375 [ ] 6243003 [ ] 6223973 [ ]		4.00	3.99	4.0
						7.00	7.02	7.0
						10.01	10.01	10.0
[X] [ ] Turbidity meter	NTU	900	Hach 2100P or 2100Q Turbidimeter	06120C020523 (P) [ ] 13120C030432 (Q) [X] 17110C062619 (Q) [ ]		10 NTU verification	16.4 NTU	11.0
						< 0.4		
						20		
						100		
						800		
[X] Sp. Cond. meter	uS mS	0900	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [X] 6212375 [ ] 6243003 [ ] 6223973 [ ]		7,000 mS @ 25 °C	7,004	2,000
[ ] PID	ppm		MinRAE 2000			open air zero		MIBK response factor = 1.0
						____ ppm Iso. Gas		
[X] Dissolved Oxygen	ppm	0900	HACH Model HQ30d	080700023281 [ ] 100500041867 [ ] 140200100319 [X]		100% Satuartion	100% 100% slope	
[ ] Particulate meter	mg/m^3					zero air		
[ ] Radiation Meter	uR/H					background area		

ADDITIONAL REMARKS:

PREPARED BY: TAS **DATE:** 5/5/20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: South Side Plaza Date: 5/5/20

Location: Jamestown NY Project No.: B0505-012-001 Field Team: TAB/CWL

Well No. MW-5			Diameter (inches): 2			Sample Date / Time: 5-5-20 / 1410			
Product Depth (fbTOR):			Water Column (ft): 10.31			DTW when sampled: 9.82			
DTW (static) (fbTOR): 9.26			One Well Volume (gal): 1.68			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 19.57			Total Volume Purged (gal):			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1355	0 Initial	0.00	7.20	13.3	2804	>1000	1.68	95	Turbid, no odor
1357	1 9.69	0.50	7.11	11.9	2863	391	0.91	90	Sl Turbid " "
1359	2 9.81	1.50	7.10	12.2	2881	140	1.40	90	" " " "
1402	3 9.80	2.25	7.08	11.5	2917	112	1.29	89	" " " "
1405	4 9.81	3.00	7.07	12.0	2907	52.7	1.22	89	Clear " "
1407	5 9.81	3.50	7.06	12.1	2906	42.2	0.95	88	" " "
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1410	S1 9.82	4.00	7.05	11.9	2901	29.9	1.20	88	Clear no odor
1419	S2 9.90	5.00	7.07	13.0	2881	15.9	1.21	87	" " "

Well No. MW-17			Diameter (inches): 2			Sample Date / Time: 5-5-20 / 1508			
Product Depth (fbTOR):			Water Column (ft): 8.13			DTW when sampled: 10.00			
DTW (static) (fbTOR): 7.49			One Well Volume (gal): 1.33			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 15.62			Total Volume Purged (gal): 5.00			Purge Method: Disposable Bailer			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1457	0 Initial	0.00	6.89	14.0	4938	>1000	1.18	-60	Turbid
1459	1 9.13	1.50	6.76	12.4	5849	>1000	2.17	-44	"
1502	2 10.40	3.00	6.80	12.3	5138	>1000	2.55	-29	"
1503	3 11.11	4.50	6.93	11.9	3425	>1000	1.97	-25	"
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1508	S1 10.00	4.50	6.95	12.1	2871	>1000	1.69	-3	Turbid
1510	S2 9.50	5.00	7.00	12.4	3272	>1000	1.33	-7	"

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Southside Plaza Date: 5/5/20

Location: Jamestown NY Project No.: B0505-05-0021 Field Team: JAB/CM

Well No. MW-7			Diameter (inches): 2			Sample Date / Time: 5-5/20 / 1152			
Product Depth (fbTOR):			Water Column (ft): 9.74			DTW when sampled: 4.75			
DTW (static) (fbTOR): 5.13			One Well Volume (gal): 1.59			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 14.87			Total Volume Purged (gal): 5.00			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1123	0 Initial	0.00	7.15	9.9	740.3	475	2.08	97	SL Turbid
1126	1 5.70	0.25	6.73	9.9	746.4	358	1.26	94	" "
1128	2 6.15	0.50	6.68	9.7	733.8	123	1.53	93	" "
1130	3 6.53	1.00	6.66	9.7	721.6	97	1.80	94	" "
1132	4 7.09	1.25	6.77	9.7	677.2	122	2.20	91	" "
1134	5 7.33	1.50	6.72	9.6	729.7	151	1.85	93	" "
1141	6 9.94	3.00	6.56	9.8	702.1	73.2	1.35	97	Clear
1156	7 10.87	4.50	6.50	10.1	616.4	171	1.53	102	SL Turbid
	8								
	9								
	10								
Sample Information:									
1152	S1 10.95	4.75	6.52	10.1	616.1	199	1.75	103	SL Turbid
1209	S2 13.09	5.00	6.56	11.1	689.2	276	2.27	107	" "

Well No. MW-15			Diameter (inches): 2			Sample Date / Time: 5-5-20 / 1310			
Product Depth (fbTOR):			Water Column (ft): 5.68			DTW when sampled: 7.55			
DTW (static) (fbTOR): 7.09			One Well Volume (gal): 0.93			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 12.77			Total Volume Purged (gal): 3.00			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1258	0 Initial	0.00	7.16	12.2	858.4	>1000	2.48	86	Turbid
1300	1 7.44	0.25	7.20	11.0	835.2	>1000	2.52	86	"
1302	2 7.55	0.75	7.20	10.8	834.8	>1000	2.50	85	"
1304	3 7.54	1.00	7.20	10.5	823.9	>1000	2.53	85	"
1306	4 7.55	1.50	7.20	10.7	817.3	977	2.49	83	"
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1310	S1 7.55	2.00	7.21	10.9	801.2	618	2.47	82	Turbid
1326	S2 7.56	3.00	7.20	11.5	783.3	124	2.54	81	SL Turbid

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: JAB

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Southside Plaza Date: 5/5/20

Location: Jamestown NY Project No.: BOS15-009-001 Field Team: TAB/CLT

Well No. MW-10A			Diameter (inches): 2			Sample Date / Time: 5-5-20 / 1008			
Product Depth (fbTOR): —			Water Column (ft): 9.35			DTW when sampled: 8.35			
DTW (static) (fbTOR): 2.44			One Well Volume (gal): 1.52			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 11.79			Total Volume Purged (gal): 5.00			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
0931	0 Initial	0.00	6.74	10.0	1178	>1000	2.28	130	Turbid
0935	1 3.37	0.25	7.09	9.7	1212	373	2.00	132	SL Turbid
0937	2 4.31	0.35	7.15	9.5	1213	183	1.85	131	" "
0939	3 5.05	0.50	7.15	9.3	1202	171	1.60	125	" "
0944	4 6.65	1.50	7.24	9.4	907.3	70.9	3.37	112	Clear
0952	5 7.81	3.00	7.03	9.1	1214	74.6	1.58	120	Clear
1006	6 8.20	4.50	7.11	9.5	1187	144	1.64	95	SL Turbid
	7								
	8								
	9								
	10								
Sample Information: MS/MSD short list									
1008	S1 8.35	4.75	7.20	9.0	1190	136	1.80	93	SL Turbid
~~1005~~ 1015	S2 9.48	5.00	7.32	9.0	1233	42.3	1.51	95	Clear

Well No. MW-11A			Diameter (inches): 2			Sample Date / Time: 5-5-20 / 1045			
Product Depth (fbTOR):			Water Column (ft): 7.61			DTW when sampled: 4.07			
DTW (static) (fbTOR): 3.21			One Well Volume (gal): 1.24			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 10.82			Total Volume Purged (gal): 5.00			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1030	0 Initial	0.00	7.55	10.4	505.7	>1000	3.68	79	Turbid
1035	1 3.95	0.75	7.62	10.7	533.9	>1000	2.85	74	Turbid
1037	2 4.00	1.25	7.57	10.7	543.7	>1000	2.68	76	Turbid
1039	3 4.00	2.00	7.53	10.7	545.4	658	2.84	79	Turbid
1040	4 4.05	2.50	7.51	10.7	549.4	322	2.85	80	SL Turbid
1043	5 4.05	3.25	7.48	10.6	550.9	205	2.71	79	" "
	6								
	7								
	8								
	9								
	10								
Sample Information: Blind Dup ☐ / Short list									
1045	S1 4.07	3.50	7.48	10.6	549.8	406	2.70	79	SL Turbid
1052	S2 4.07	5.00	7.45	10.6	548.5	95.4	2.51	77	Clear

REMARKS: 10A TOOK MS/MSD FOR Short list

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: Southside Plaza

Project No.: B0505-017-001

Client:

Date: 5-6-20

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	0856	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [X] 6212375 [ ] 6243003 [ ] 6223973 [ ]	CEH	4.00 7.00 10.01	4.04 7.09 10.01	4 7 10
[X] Turbidity meter	NTU	0850	Hach 2100P or 2100Q Turbidimeter	06120C020523 (P) [ ] 13120C030432 (Q) [X] 17110C062619 (Q) [ ]	CEH	10 NTU verification < 0.4 20 100 800	10.4	10
[X] Sp. Cond. meter	uS mS	0850	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [X] 6212375 [ ] 6243003 [ ] 6223973 [ ]	CEH	7000 mS @ 25 °C	7001	7,000
[ ] PID	ppm		MinRAE 2000			open air zero ____ ppm Iso. Gas		MIBK response factor = 1.0
[X] Dissolved Oxygen	ppm	0850	HACH Model HQ30d	080700023281 [ ] 100500041867 [ ] 140200100319 [X]	CEH	100% Satuartion	100% 103.0% slope	0% slope
[ ] Particulate meter	mg/m^3					zero air		
[ ] Radiation Meter	uR/H					background area		

ADDITIONAL REMARKS:

PREPARED BY: CHL **DATE:** 5-6-20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: South Side plaza
Location: Jamestown NY
Project No.: B0505-019-001
Date: 5/6/20
Field Team: CLeek/KTAB

Well No. MW-16			Diameter (inches): 2			Sample Date / Time: 5-6-20 / 1354			
Product Depth (fbTOR):			Water Column (ft): 7.96			DTW when sampled: 11.97			
DTW (static) (fbTOR): 8.04			One Well Volume (gal): 1.30			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 16.00			Total Volume Purged (gal): 4.50			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc Volume (gallons)	pH (units)	Temp (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1328	0 Initial	0.00	7.25	12.6	5152	>1000	7.34	85	Turbid, no odor
1330	1 8.45	0.25	7.16	11.5	5378	>1000	7.45	89	" " "
1332	2 8.73	0.50	7.15	11.4	5315	>1000	7.70	91	" " "
1333	3 8.85	0.75	7.14	11.9	5291	>1000	7.85	91	" " "
1334	4 9.15	1.00	7.09	11.5	5297	>1000	7.91	93	" " "
1343	5 11.40	2.75	7.02	11.8	5614	>1000	7.84	96	" " "
1352	6 11.95	4.00	7.06	12.0	5671	600	5.12	93	" " "
	7								
	8								
	9								
	10								
Sample Information:									
1354	S1 11.97	4.25	7.06	12.2	5642	>1000	5.17	94	Turbid, no odor
1405	S2 13.58	4.50	7.06	12.2	5642	>1000	3.22	92	" " "

Well No. MW-1			Diameter (inches): 2			Sample Date / Time: 5/6/20 1443			
Product Depth (fbTOR): -			Water Column (ft): 12.47			DTW when sampled: 1443			
DTW (static) (fbTOR): 7.40			One Well Volume (gal): 2.03			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 19.87			Total Volume Purged (gal):			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc Volume (gallons)	pH (units)	Temp (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1429	0 Initial	0.00	7.13	12.2	4048	>1000	1.20	99	Turbid, no odor
1431	1 8.05	0.75	7.08	11.6	4048	308	1.69	-14	" " "
1433	2 8.10	1.50	7.09	11.2	4077	194	1.48	-16	SL Turbid, no odor
1437	3 8.20	2.25	7.03	11.2	4165	136	1.12	-17	" " "
1439	4 8.23	3.00	7.03	11.2	4126	82.8	1.08	-14	clear, no odor
1441	5 8.20	4.00	7.05	11.2	4168	54.9	1.10	-12	" " "
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1443	S1 8.20	5.00	7.10	11.0	4199	36.6	1.14	-11	Clear, no odor
1446	S2 8.20	5.50	7.02	11.3	4230	27.4	1.33	-13	" " "

REMARKS:

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

Note: All water level measurements are in feet, distance from top of riser.

PREPARED BY: DAB

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: South Side Plaza
Location: Jamestown NY
Project No: B0505-009-001
Date: 5/6/20
Field Team: TAB Ickes

Well No. MW-8			Diameter (inches): 2			Sample Date / Time: 5-6-20 / 0927			
Product Depth (fbTOR):			Water Column (ft): 12.72			DTW when sampled: 5.82			
DTW (static) (fbTOR): 4.25			One Well Volume (gal): 2.07			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 16.97			Total Volume Purged (gal): 5.50			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
0915	0 Initial	0.00	7.13	11.1	623.3	>1000	1.54	78	Turbid, no odor
0918	1 5.73	0.50	7.40	10.9	655	>1000	1.37	84	" " "
0919	2 5.73	1.75	7.41	11.1	652.3	>1000	1.52	86	" " "
0921	3 5.80	2.50	7.45	11.1	644.3	>1000	1.50	89	" " "
0923	4 5.83	3.00	7.46	11.1	647.1	535	1.33	91	" " "
0924	5 5.83	3.50	7.49	10.9	646.6	452	1.27	93	" " "
	6								
	7								
	8								
	9								
	10								
Sample Information:									
0927	S1 5.82	4.00	7.50	10.9	650.0	464	1.20	93	Turbid, no odor
0931	S2 6.00	5.50	7.55	10.1	653.1	331	1.42	96	SL Turbid, " "

Well No. MW-6			Diameter (inches): 2			Sample Date / Time: 5-6-20 / 1010			
Product Depth (fbTOR):			Water Column (ft): 10.85			DTW when sampled: 4.74			
DTW (static) (fbTOR) 4.26			One Well Volume (gal): 1.77			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR) 15.11			Total Volume Purged (gal): 8.00			Purge Method Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
0945	0 Initial	0.00	7.12	9.2	1915	182	1.82	116	SL Turbid no odor
0948	1 4.75	0.25	7.08	9.2	1883	166	1.50	107	" " "
0951	2 4.75	1.00	7.10	9.7	1875	158	1.38	102	" " "
0953	3 4.75	1.25	7.16	9.8	1758	191	1.33	99	" " "
0956	4 4.74	1.50	7.23	9.6	1638	138	1.45	95	" " "
0958	5 4.74	2.00	7.24	9.8	1510	83.9	1.36	93	Clear, no odor
1001	6 4.74	2.75	7.29	9.9	1446	56.9	1.24	93	" " "
1003	7 4.74	3.25	7.29	9.9	1374	40.2	1.35	92	" " "
1005	8 4.74	3.75	7.31	9.8	1354	26.3	1.40	91	" " "
1006	9 4.74	4.25	7.35	9.7	1315	24.5	1.66	91	" " "
	10								
Sample Information: MS/MSD Full list collected									
1010	S1 4.74	5.00	7.32	9.8	1326	15.9	1.51	92	Clear, no odor
1040	S2 5.20	8.00	7.41	9.9	1167	4.11	1.54	91	

REMARKS:

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

Note: All water level measurements are in feet, distance from top of riser.

PREPARED BY:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: South Side Plaza
Location: Jamestown
Project No.: B0505-019-001
Date: 5/6/20
Field Team: TAB/cbl

Well No. MW-2			Diameter (inches): 2			Sample Date / Time: 5-6-20 / 1134			
Product Depth (fbTOR):			Water Column (ft): 9.95			DTW when sampled: 5.68			
DTW (static) (fbTOR): 5.21			One Well Volume (gal): 1.62			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 15.16			Total Volume Purged (gal): 4.50			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1114	0 Initial	0.00	6.87	11.0	2822	>1000	0.08	-57	Turbid, no odor
1116	1 5.98	1.00	6.85	10.9	2442	>1000	1.19	-46	" " "
1119	2 5.90	1.50	6.87	11.0	2080	273	0.98	-38	Turbid, " "
1121	3 5.85	1.75	6.92	11.0	1851	307	1.41	-32	" " "
1122	4 5.83	2.25	6.95	10.9	1779	126	1.97	-28	SL Turbid, no odor
1124	5 5.79	2.75	6.95	11.0	1705	106	2.10	-29	" " " "
1127	6 5.81	3.00	6.97	11.0	1631	123	1.87	-27	" " " "
1129	7 5.73	3.25	6.97	11.1	1583	475	1.66	-28	Turbid, no odor
1131	8 5.70	3.75	6.97	11.1	1555	74.3	1.55	-27	Clear, no odor
	9								
	10								
Sample Information:									
1134	S1 5.68	4.00	6.99	11.2	1510	56.1	1.61	-24	Clear, no odor
1140	S2 5.63	4.50	7.02	11.1	1500	29.9	1.33	-23	" " "

Well No. MW-19			Diameter (inches): 2			Sample Date / Time: 5-6-20 / 1227			
Product Depth (fbTOR):			Water Column (ft) 9.55			DTW when sampled: 7.70			
DTW (static) (fbTOR): 6.14			One Well Volume (gal): 1.56			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 15.69			Total Volume Purged (gal): 5.50			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1207	0 Initial	0.00	7.07	11.5	4580	>1000	1.63	4	Turbid, no odor
1209	1 6.79	0.25	7.04	11.0	4541	>1000	1.36	16	" " "
1211	2 6.75	0.50	7.04	11.0	4475	>1000	1.56	22	" " "
1212	3 6.75	1.00	7.05	11.0	4400	>1000	1.65	27	" " "
1213	4 7.09	1.25	7.07	10.8	4080	509	1.56	31	" " "
1215	5 7.09	1.50	7.07	10.8	4007	569	1.77	35	" " "
1220	6 7.33	2.75	7.08	10.9	3776	295	1.56	41	" " "
1223	7 7.50	3.25	7.08	10.9	3713	195	1.62	45	SL Turbid, " "
1225	8 7.63	4.50	7.06	11.0	3584	119	1.64	48	" " " "
	9								
	10								
Sample Information:									
1227	S1 7.70	5.00	7.08	10.8	3564	104	1.83	50	SL Turbid, no odor
1241	S2 7.70	5.50	7.09	11.0	3450	>1000	1.65	62	Turbid, no odor

REMARKS: Took BD-2 for MW-19

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

Note: All water level measurements are in feet, distance from top of riser.

PREPARED BY: TAB

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: South Side Plaza GWM

Project No.: B6505-019-001

Client:

Date: 5-7-20

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	1630	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [X] 6212375 [ ] 6243003 [ ] 6223973 [ ]	CEH	4.00 7.00 10.01	4.00 7.09 10.00	4 7 10
[X] Turbidity meter	NTU	1630	Hach 2100P or 2100Q Turbidimeter	06120C020523 (P) [ ] 13120C030432 (Q) [X] 17110C062619 (Q) [ ]	CEH	10 NTU verification < 0.4 20 100 800	10.4	10
[X] Sp. Cond. meter	uS mS	1630	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [X] 6212375 [ ] 6243003 [ ] 6223973 [ ]	CEH	7000 mS @ 25 °C	6993	7,000
[ ] PID	ppm		MinRAE 2000			open air zero _____ ppm Iso. Gas		MIBK response factor = 1.0
[X] Dissolved Oxygen	ppm	1630	HACH Model HQ30d	080700023281 [ ] 100500041867 [ ] 140200100319 [X]	CEH	100% Satuartion	100% 100.0% slope	
[ ] Particulate meter	mg/m^3					zero air		
[ ] Radiation Meter	uR/H					background area		

ADDITIONAL REMARKS:

PREPARED BY: TH3 **DATE:** 5-7-20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Southside Plaza
Location: Jamestown NY
Project No. B0505-019-001
Date: 5/7/20
Field Team: CLH/JMB

Well No. MW-12			Diameter (inches): 1			Sample Date / Time: 5-7-20 / 2112			
Product Depth (fbTOR): -			Water Column (ft): 6.67			DTW when sampled:			
DTW (static) (fbTOR): 3.51			One Well Volume (gal): 0.27			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 10.18			Total Volume Purged (gal): 0.85			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
2024	0 Initial	0.00	7.58	13.3	583	>1000	3.94	16	Turbid, no odor
2028	1	0.25	7.38	14.2	546.6	>1000	3.87	31	" " "
2036	2	0.50	7.32	14.8	604.8	534	3.52	53	" " "
2040	3	0.75	7.28	14.8	612.2	437	2.92	54	" " "
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
2042	S1	0.80	7.32	14.8	618.2	326	2.85	56	SL Turbid, no odor
2112	S2	0.85	7.31	14.8	647.0	147	2.78	56	" " "

Well No. MW-13			Diameter (inches): 1			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft): 5.8			DTW when sampled:			
DTW (static) (fbTOR): 4.67			One Well Volume (gal): 0.24			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 10.47			Total Volume Purged (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
2132	0 Initial	0.00	7.59	15.7	882.6	>1000	2.92	61	Turbid, no odor
2140	1	0.25	7.49	16.4	884.9	158	2.17	60	SL Turbid, no odor
0145	2	0.50	7.47	15.9	879.8	133	1.97	59	"
2148	3	0.75	7.48	15.4	879.0	278	2.29	60	"
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
2150	S1	0.80	7.50	16.5	882.4	170	2.28	60	SL Turbid, no odor
2212	S2	0.85	7.52	16.2	881.5	>1000	1.99	63	Turbid, no odor

REMARKS:

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

Note: All water level measurements are in feet, distance from top of riser.

PREPARED BY: JMB

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: South Side Plaza
Location: Jamestown NY
Project No.:
Date: 5/7/20
Field Team: CLC | TMB

Well No. MW-18			Diameter (inches): 2			Sample Date / Time: 5-7-20 / 1720			
Product Depth (fbTOR):			Water Column (ft): 8.07			DTW when sampled: 11.95			
DTW (static) (fbTOR): 6.45			One Well Volume (gal): 1.32			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 14.52			Total Volume Purged (gal): 3.25			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1705	0 Initial	0.00	6.79	11.8	3764	>1000	1.32	138	Turbid, no odor
1708	1 8.45	0.50	7.18	11.0	3167	>1000	2.67	124	" " "
1710	2 8.70	1.00	7.16	11.0	3169	>1000	2.87	125	" " "
1712	3 8.92	1.25	7.15	11.0	3177	>1000	2.92	128	" " "
1714	4 10.15	1.50	7.20	11.0	3166	>1000	2.59	123	" " "
1719	5 11.37	2.00	7.20	11.4	3179	>1000	2.77	115	" " "
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1720	S1 11.95	2.50	7.19	11.0	3201	>1000	2.62	113	Turbid, no odor
1751	S2 13.10	3.25	7.24	10.5	3768	>1000	N/A	107	" " "

Well No. MW-3			Diameter (inches): 2			Sample Date / Time: 5-7-20 / 1858			
Product Depth (fbTOR):			Water Column (ft): 8.22			DTW when sampled: 6.29			
DTW (static) (fbTOR): 5.35			One Well Volume (gal): 1.34			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 13.57			Total Volume Purged (gal): 3.00			Purge Method: Low Flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1843	0 Initial	0.00	7.14	10.4	2862	>1000	0.06	-92	Turbid, no odor
1846	1 5.90	0.50	7.10	10.2	2695	>1000	N/A	-81	" " "
1848	2 6.10	1.00	7.05	10.2	2669	90.9	↓	-84	Clear, no odor
1850	3 6.19	1.50	7.06	10.2	2661	54.6		-80	" " "
1852	4 6.19	1.75	7.08	10.3	2622	44.8		-76	" " "
1855	5 6.15	2.00	7.11	10.3	2644	23.7	0.79	-74	" " "
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1858	S1 6.29	2.50	7.11	10.2	2648	32.2	1.17	-70	Clear, no odor
1912	S2 6.40	3.00	7.13	10.0	2649	28.2	0.82	-69	" " "

REMARKS:

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

Note: All water level measurements are in feet, distance from top of riser.

PREPARED BY: TMB | CLC

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: South side Plaza
Location: James town NY
Project No.:
Date: 8/7/20
Field Team: dkt / TW3

Well No. MW-14			Diameter (inches): 1			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft): 6.52			DTW when sampled:			
DTW (static) (fbTOR): 5.97			One Well Volume (gal): 0.27			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 12.49			Total Volume Purged (gal)			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1033	0 Initial	6.00	7.11	16.7	848.8	>1000	4.85	74	Turbid, no odor
1035	1	0.25	7.00	17.3	757.2	>1000	4.46	77	" " "
1040	2	0.50	6.98	17.5	667.0	576	3.86	81	" " "
1047	3	0.75	7.00	18.2	628.3	Run 565	3.36	84	" " "
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1049	S1	0.85	7.00	17.7	620.8	311	3.20	84	Turbid, no odor
1131	S2	1.00	7.05	17.5	572.6	116	2.99	84	Slt turbid, " "

Well No.			Diameter (inches):			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			One Well Volume (gal):			Purpose: ☐ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR):			Total Volume Purged (gal)			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

REMARKS:

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

Note: All water level measurements are in feet, distance from top of riser.

PREPARED BY:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

BOUWER AND RICE
SLUG TEST ANALYSIS

PROJECT:	Southside Plaza Site	**Well No.:**
PROJECT NO.:	B0505-019-001	MW-4

= green indicates numbers to insert for analysis of Bouwer and Rice

= yellow indicates value will be automatically calculated

				Conversion	
Static Water Level	**W.L =**	**5.73**	feet	5.73	feet
Well casing radius	**r_c =**	**2**	inch	0.167	feet
Sand Pack Radius	**R =**	**9**	inches	0.750	feet
Screen Length (including sand pack)	**L_e =**	**8**	feet	8	feet
Well Depth (fbgs)		**10.68**	feet	10.68	feet
Depth to Impermeable Unit (fbgs)		**11.5**	feet	11.5	feet
Depth of Penetration (full or partial)	**partial**	**11.5**	feet	11.5	feet
Water table to impermeable laye	**h =**	**5.77**	feet	5.77	feet
Water table to bottom of well	**L_w =**	**4.95**	feet	4.95	feet
Time Duration of Test	**t =**	**6.8**	min	408	sec
Is Lw = h ?	NO				
Is Lw < h ?	YES				

FROM CHART:

1. Draw straight line through early time data using exponential trend line in
2. Use early time data collected during test for H_1 and t_1 and the equation of best fit line for late time H_2 and t_2.

Determine H_1 from random T_1:

ope of Best Fit Line (m):	0.1052	
constant e =	###########	
exponent quotient =	-0.0057	
T_1 (random value) =	**0**	seconds
exponent times T_1 =	0	
H_1 value =	**0.11**	feet

Determine H_2 from random T_2:

T_2 (random value) =	**50**	seconds
exponent times T_2 =	-0.285	
H_2 value =	**0.08**	feet

If L_w < h:

$$\ln(R_e/R) = \left[\frac{1.1}{\ln(L_w/R)} + \frac{A + B\,\ln[(h - L_w)/R]}{L_e/R}\right]^{-1}$$

L_e/R =	0.88
A =	**1.840**
B =	**0.292**
ln (L_w/R) =	1.89
ln[(h - L_w)/R]	0.0892
ln R_e/R =	0.37

If L_w = h:

$$\ln(R_e/R) = \left[\frac{1.1}{\ln(L_w/R)} + \frac{C}{L_e/R}\right]^{-1}$$

L_e/R =	0.88
C =	**1.211**
ln (L_w/R) =	1.89
ln R_e/R =	0.37

$$K = \frac{r_c^2 \times \ln(R_e/R)}{2L_e} \times \frac{1}{t} \times \ln\frac{H_t}{H_0}$$

	r_c^2 x ln(R_e/R) =	0.010
	2L_e =	16
(1/t) x ln (H_t/H_o) =	(1/(t_2 - t_1)) x ln (H_1/H_2) =	0.006

HYDRAULIC CONDUCTIVITY (K):

K = 3.66E-06 ft/sec

K = 1.12E-04 cm/sec

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

BOUWER AND RICE
SLUG TEST ANALYSIS

PROJECT:	Southside Plaza Site	**Well No.:**
PROJECT NO.:	B0505-019-001	MW-4

= green indicates numbers to insert for analysis of Bouwer and Rice

= yellow indicates value will be automatically calculated

				Conversion	
Static Water Level	**W.L =**	**4.65**	feet	4.6485	feet
Well casing radius	**r_c =**	**2**	inch	0.167	feet
Sand Pack Radius	**R =**	**9**	inches	0.750	feet
Screen Length (including sand pack)	**L_e =**	**8**	feet	8	feet
Well Depth (fbgs)		**10.68**	feet	10.68	feet
Depth to Impermeable Unit (fbgs)		**11.5**	feet	11.5	feet
Depth of Penetration (full or partial)	**partial**	**11.5**	feet	11.5	feet
Water table to impermeable laye	**h =**	**6.85**	feet	6.8515	feet
Water table to bottom of well	**L_w =**	**6.03**	feet	6.03	feet
Time Duration of Test	**t =**	**6.8**	min	408	sec
Is Lw = h ?	NO				
Is Lw < h ?	YES				

FROM CHART:

1. Draw straight line through early time data using exponential trend line in
2. Use early time data collected during test for H_1 and t_1 and the equation of best fit line for late time H_2 and t_2.

Determine H_1 from random T_1:

ope of Best Fit Line (m):	0.3264	
constant e =	###########	
exponent quotient =	-0.0151	
T_1 (random value) =	**0**	seconds
exponent times T_1 =	0	
H_1 value =	**0.33**	feet

Determine H_2 from random T_2:

T_2 (random value) =	**50**	seconds
exponent times T_2 =	-0.755	
H_2 value =	**0.15**	feet

If L_w < h:

$$\ln(R_e/R) = \left[\frac{1.1}{\ln(L_w/R)} + \frac{A + B\,\ln[(h - L_w)/R]}{L_e/R}\right]^{-1}$$

L_e/R =	0.88
A =	**1.840**
B =	**0.292**
ln (L_w/R) =	2.08
ln[(h - L_w)/R]	0.0892
ln R_e/R =	0.38

If L_w = h:

$$\ln(R_e/R) = \left[\frac{1.1}{\ln(L_w/R)} + \frac{C}{L_e/R}\right]^{-1}$$

L_e/R =	0.88
C =	**1.211**
ln (L_w/R) =	1.89
ln R_e/R =	0.37

$$K = \frac{r_c^2 \times \ln(R_e/R)}{2L_e} \times \frac{1}{t} \times \ln\frac{H_t}{H_0}$$

	r_c^2 x ln(R_e/R) =	0.010
	2L_e =	16
(1/t) x ln (H_t/H_o) =	(1/(t_2 - t_1)) x ln (H_1/H_2) =	0.015

HYDRAULIC CONDUCTIVITY (K):

K = 9.90E-06 ft/sec

K = 3.02E-04 cm/sec

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

BOUWER AND RICE
SLUG TEST ANALYSIS

PROJECT:	Southside Plaza Site	**Well No.:**
PROJECT NO.:	B0505-019-001	MW-9

= green indicates numbers to insert for analysis of Bouwer and Rice

= yellow indicates value will be automatically calculated

				Conversion	
Static Water Level	**W.L =**	**4.15**	feet	4.15	feet
Well casing radius	**r_c =**	**2**	inch	0.167	feet
Sand Pack Radius	**R =**	**9**	inches	0.750	feet
Screen Length (including sand pack)	**L_e =**	**12**	feet	12	feet
Well Depth (fbgs)		**12.33**	feet	12.33	feet
Depth to Impermeable Unit (fbgs)		**12.33**	feet	12.33	feet
Depth of Penetration (full or partial)	**full**	**12.33**	feet	12.33	feet
Water table to impermeable laye	**h =**	**8.18**	feet	8.18	feet
Water table to bottom of well	**L_w =**	**8.18**	feet	8.18	feet
Time Duration of Test	**t =**	**8.3**	min	498	sec
Is Lw = h ?	YES				
Is Lw < h ?	NO				

If L_w < h:

$$\ln(R_e/R) = \left[\frac{1.1}{\ln(L_w/R)} + \frac{A + B\,\ln[(h - L_w)/R]}{L_e/R}\right]^{-1}$$

L_e/R =	1.33
A =	**2.017**
B =	**0.319**
ln (L_w/R) =	0.90
ln[(h - L_w)/R]	0
ln R_e/R =	1.82

If L_w = h:

$$\ln(R_e/R) = \left[\frac{1.1}{\ln(L_w/R)} + \frac{C}{L_e/R}\right]^{-1}$$

L_e/R =	16.00
C =	**1.416**
ln (L_w/R) =	2.39
ln R_e/R =	1.82

FROM CHART:

1. Draw straight line through early time data using exponential trend line in
2. Use early time data collected during test for H_1 and t_1 and the equation o best fit line for late time H_2 and t_2.

Determine H_1 from random T_1:

ope of Best Fit Line (m):	0.0773	
constant e =	###########	
exponent quotient =	-0.002	
T_1 (random value) =	**0**	seconds
exponent times T_1 =	0	
H_1 value =	**0.08**	feet

Determine H_2 from random T_2:

T_2 (random value) =	**50**	seconds
exponent times T_2 =	-0.1	
H_2 value =	**0.07**	feet

$$K = \frac{r_c^2 \times \ln(R_e/R)}{2L_e} \times \frac{1}{t} \times \ln\frac{H_t}{H_0}$$

	r_c^2 x ln(R_e/R) =	0.051
	2L_e =	24
(1/t) x ln (H_t/H_o) =	(1/(t_2 - t_1)) x ln (H_1/H_2) =	0.002

HYDRAULIC CONDUCTIVITY (K):

K = 4.22E-06 ft/sec

K = 1.29E-04 cm/sec

APPENDIX E

LABORATORY ANALYTICAL DATA PACKAGES

APPENDIX F

DATA USABILITY SUMMARY REPORT

` Data Validation Services
120 Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone (518) 251-4429
harry@frontiernet.net

June 25, 2020

Angela Muir
Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike
Buffalo, NY 14218

RE: Validation of the Southside Plaza Site Analytical Laboratory Data
Data Usability Summary Report (DUSR)
Eurofins TestAmerica SDG Nos. 200-53449, 480-168789, 480-168791, 480-168873, 480-168915, 480-169000, 480-169003, 480-169085, 480-169102, 480-169174, 480-169243, 480-169464, 480-169534, 480-169687, 480-169763, 480-169765, and 480-170853

Dear Ms. Muir:

Review has been completed for the data packages generated by Eurofins that pertain to samples collected between 04/16/20 and 06/05/20 at the Southside Plaza site. Seven soil samples, eleven aqueous samples, and an aqueous field duplicate were processed for TCL and 6 NYCRR Part 375 CP-51 (CP-51) volatiles, TCL semivolatiles, TCL pesticides, TCL Herbicides, Aroclor PCBs, TCL TAL metals, and per- and polyfluorinated alkyl substances (PFAS). The aqueous samples were also processed for 1,4-dioxane by SIM, and the metals for the aqueous samples were processed for metals on the filtered fraction. Thirteen soil samples, ten aqueous samples, and field duplicates of each matrix were processed for TCL and CP-51 volatiles, TCL semivolatiles, and TAL metals; one of those samples was also processed for Total Organic Carbon (TOC). Fourteen other soil samples and two other field duplicates were processed for various combinations of those analytical fractions. One aqueous sample was processed for total and dissolved iron and manganese, dissolved gases, TOC, and seven other wet chemistry analytes. Nine 6 L summa canisters were processed for volatiles. The analytical methodologies are those of the USEPA SW846, USEPA method TO-15, and a modified USEPA method 537.

The data packages submitted by the laboratory contain full deliverables for validation, and this usability report is generated from review of the QC summary form information, with full review of sample raw data and limited review of associated QC raw data. The reported QC summary forms and sample raw data have been reviewed for application of validation qualifiers, with guidance from the USEPA national and regional validation documents and the specific requirements of the analytical methodology. The following items were reviewed:

* Data Completeness
* Case Narrative
* Custody Documentation
* Holding Times
* Surrogate, Isotopic Dilution, and Internal Standard Recoveries
* Method/Preparation/Canister Blanks
* Matrix Spike Recoveries/Duplicate Correlations
* Blind Field Duplicate Correlations
* Laboratory Control Sample (LCS)

* Instrumental Tunes
* Initial and Continuing Calibration Standards
* Canister Pressures
* Serial Dilution Evaluation
* Method Compliance
* Sample Result Verification

Those items listed above which show deficiencies are discussed within the text of this narrative. All of the other items were determined to be acceptable for the DUSR level review, as discussed in NYS DER-10 Appendix B Section 2.0 (c). Documentation of the outlying parameters cited in this report can be found in the laboratory data package.

In summary, results for the samples are usable either as reported or with minor qualification. However, many of the soil pesticide analyses, and some of the soil semivolatile analyses were performed at dilution due to the sample matrix, resulting in significantly elevated reporting limits that may be above the project DQOs.

Data completeness, accuracy, representativeness, reproducibility, and comparability are acceptable. Sensitivity is affected by the aforementioned matrix effect on pesticide reporting limits.

The laboratory modifications to the USEPA method 537 are significant, including acceptance ranges, consistent in many respects to the advances in the available monitoring compounds. Validation actions are based on regulatory agency guidance and the laboratory procedures, in consideration that the laboratory undergoes NYS DOH certifications and NYS SOP review.

Validation qualified definitions and client sample identifications are attached to this text. Also included in this report are the client EDDs with recommended qualifiers/edits applied in red.

Chains-of-Custody/Sample Receipt

The down-arrow is missing from the collection date on the custody form for the soils reported in 480-168915. The initial release date and time are also missing from that custody form.

The time of release was missing from the initial relinquish entry of the custody form for samples reported in SDG 480-169174. The collection date was not present on the custody form for the samples reported in DG 480-169534; the laboratory login forms state that all entries were complete.

Blind Field Duplicate

The blind field duplicate evaluations were performed on MW-17(8-10'), SB-26(2-4'), NS-1(2-12'), MW-11, and MW-19. Correlations fall within laboratory guidelines, with the following exceptions, results for which are qualified in the indicated parent sample and its duplicate:

- Arsenic, calcium, and magnesium in MW-17(8-10').
- Tetrachloroethene in SB-26(2-4')

TCL Volatile Analyses by EPA 8260C

The matrix spikes of MW-19(12-14), SB-24(2-4), MW-6, and MW-10A show recoveries and duplicate correlations that are within validation guidelines, with the following exception, the result for which is qualified as estimated in the indicated parent sample: tetrachloroethene (228% and 465%) in MW-19(12-14).

The following detected results are considered external contamination and edited to reflect non-detection due to presence in the associated blanks:

- Methylene chloride in samples reported in SDG 480-169000, 480-169003, 480-169243
- Dichlorodifluoromethane in MW-5

Calibration standards showed acceptable responses, with the following exceptions, results for which are qualified as estimated in the indicated associated samples:

- Vinyl chloride (23%D) in MW-1D, (12-14), MW-15 (4-6), and MW-16 (14-16)
- Naphthalene (34%D) in MW-17 (8-10), Blind Dup #1, and MW-19 (12-14)
- Vinyl chloride and bromomethane (22%D and 24%D) in SB-23 (10-12), SB-25 (12-16), and in all samples reported with SDG 480169003-1

Holding times were met. Surrogate and internal standard recoveries are compliant.

TCL Semivolatile and 1,4-Dioxane Analyses by EPA8270D (Full Scan/SIM)

The matrix spikes of TCL SVOCs on MW-19(12-14), MW-18(14-16), MW-21(8-12), NS-2(2-12), MW-6, and MW-10A, and those for 1,4-dioxane on MW-6 show acceptable and recoveries within validation guidelines, with the following exception, the result for which is qualified as estimated in the indicated parent sample: n-nitrosodiphenylamine in MW-10A.

Calibration standards show responses within validation action levels, with the following exceptions, results for which are qualified as estimated in the indicated associated samples: pentachlorophenol (21%D to 53%D) MW-10A, MW-5, MW-7, and in all samples reported with SDG 480-169464-1, 480-169763-1, and 480-169765-1.

Holding times were met. Surrogate and internal standard recoveries are compliant. Blanks show no contamination of target analytes affecting sample reported results.

Some of the samples were processed only at dilution due to viscosity or extract color.

Tentatively Identified Compounds (TICs) that are acetone and aldol condensates were not identified as such by the laboratory. Those and other extraction artifacts were removed as sample TIC components from the EDD. TICs also detected in the associated method blanks (of which there were many) should have been flagged as "B". They have also been removed from consideration as sample components.

TCL Pesticide, TCL Herbicides and Aroclor PCBs by EPA 8081B, EPA8151, and 8082A

Many of the detected pesticide results exhibit elevated dual column quantitative correlations, and are qualified to reflect the uncertainty in identification and/or quantitation. The values have been either qualified as estimated ("J"), qualified as tentative in identification and estimated in value ("NJ"), or edited to non-detection ("U"), depending on the degree of variance. In some instances, the adjusted reporting limits are elevated over the original method reporting limits.

Numerous soil samples were processed at significant dilutions, including twentyfold and fiftyfold, due to "nature of the matrix". This results in proportionally elevated reporting limits.

The following low level detected results are considered external contamination and edited to reflect non-detection due to presence in the associated blanks:

- a-BHC in samples reported in SDG 480-168791

- methoxychlor in SB-18(0.5-2.0')
- g-BHC in NS1(2-12')
- a-BHC, g-BHC, dieldrin, 4,4'-DDT, and endrin aldehyde in samples reported in SDGs 480-169763 and 480-169765
- PFNA in MW-6, MW-14, and Blind Dup 2

The results for herbicides in MW-19 are qualified as estimated due to low recoveries (32% and 38%) of the surrogate standard.

Herbicide matrix spikes of MW-16(14-16), SB-25(12-16), and MW-6, pesticide matrix spikes of MW-6 and NS-2(2-12), and Aroclor 1016/1260 matrix spikes MW-18(14-16), NS-2(2-12), and MW-6 show recoveries and correlations within validation guidelines.

The pesticide matrix spikes of NS-2(2-12') could not be evaluated because they, like the parent sample, were processed at fiftyfold dilution.

The detected results for 4,4'-DDT in MW-7 and MW-15 were qualified as estimated, with a high bias, due to elevated recoveries (131% and 139%) in the associated LCS.

Holding times were met. Calibration standard responses are within validation guidelines.

TAL Metals and Iron/Manganese Analyses by EPA 6020B, 7470A, and 7471B

The results for the dissolved metals have been qualified as estimated, as the filtration and subsequent delayed preservation was performed in the laboratory.

Matrix spikes/duplicate evaluations were performed on MW-19(12-14), NS-2(2-12'), SB-24(2-4), SB-23(10-12), MW-6-Dissolved, and MW-10A-Dissolved. They show recoveries and correlations within validation guidelines, with the following exceptions, results for which are qualified as estimated in the indicated parent sample:

Parent Sample	Element	Outlying % Recoveries	Outlying % RPD's
MW-19 (12-14)	antimony	70,60	70,60
	barium	240	
	potassium	153,212	
NS-2 (2-12)	aluminum	368,314	
	antimony	74,70	
	barium	156,178	
	calcium	521,1118	47
	copper	66,63	
	lead	57,45	
	magnesium	235	42
	potassium	174,154	
SB-24 (2-4)	antimony	48,45	
	potassium	265,308	
MW-10A-Dissolved	barium	55,131	
	magnesium	53,135	
	silver	155	56

The following detected results are considered external contamination and edited to reflect non-detection due to presence in the associated blanks:

- Selenium in SB-15(2-4') and SB-17(10-12')
- Potassium, manganese, and zinc in samples flagged by the laboratory as "JB" in SDG 480-169454
- Potassium in MW-7
- Manganese in MW-11, BD, and MW-13-Dissolved
- Zinc in all samples reported in 480-169534

The ICP serial dilution evaluations of NS-2(2-12'), MW-10A-Dissolved, and MW-6-Dissolved show acceptable correlations, with the following exceptions, results for which are qualified as estimated in the indicated sample: barium (19%D) in NS-2(2-12').

Total and dissolved fractions correlate well.

PFAS by Modified EPA Method 537

PFAS compounds are identified by their common acronyms in this report. The EDDs reference both the technical names and the acronyms.

The detections of PFOS in MW-4 and MW-5 are qualified as being the Estimated Maximum Possible Concentration (EMPC) because the ion ratios fall outside the acceptable range.

The results for PFTeDA in SB-18(0.5-2.0) and PFUnA in MW-15 are qualified as estimated due to low recovery (46%) of the associated isotopic dilution standard.

The following low level detected results are considered external contamination and edited to reflect non-detection due to presence in the associated blanks:

- PFPeA, PFOA, and PFHxS in MW-16(14-16), MW-18(14-16), MW-25(12-16), MW-21 8-21', SB-27 4-8', and those within validation action range in samples reported in SDG 480-169243
- PFPeA, PFOA, PFBS, 6:2-FTS, and PFHxS in SB-19(2-4') and SB-18(0.5-2.0)
- PFNA in MW-7, MW-14, and MW-18
- PFPeA in MW-18
- PFBA in MW-3 and MW-18

Matrix spikes of MW-16(14-16), NS-2(2-12), and MW-6 show recoveries and correlations within validation guidelines.

The results for PFTriA in the samples reported in SDGs 480-169534, 480-169763, and 480-169765 are qualified as estimated, with a low bias, due to low recoveries (65% and 69%) in the associated LCSs.

Volatile Analyses by EPA TO-15

The following reported detections have been edited to non-detection due to poor mass spectral qualification:

- methyl t-butyl ether in SV-10
- chlorobenzene and methylene chloride in SV-09

Holding times were met, internal standard responses are compliant, and instrument tunes meet fragmentation requirements. LCS recoveries are acceptable.

Initial and continuing calibration standard (ICV and CCV) linearity and calibration verification responses are compliant.

Dissolved Gases and Wet Chemistry Analyses by EPA 8015

Review was conducted for method compliance, holding times, transcription, calculations, standard and blank acceptability, accuracy and precision, etc., as applicable to each procedure. All were found acceptable for the validated sample, unless noted specifically within this text.

Matrix spike and duplicate evaluations were not performed on these analytes. LCS recoveries are acceptable. Holding times were met, and blanks show no contamination affecting sample reported results.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Attachments: Validation Qualifier Definitions
Sample Identifications
Qualified Laboratory EQuIS EDDs

VALIDATION DATA QUALIFIER DEFINITIONS

U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low.
J+	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
UJ	The analyte was analyzed for, but was not detected. The associated reported quantitation limit is approximate and may be inaccurate or imprecise.
NJ	The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control limits. The analyte may or may not be present.
EMPC	The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample.

Sample Summaries

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 200-53449-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
200-53449-1	SV-01	Air	04/16/20 15:13	04/20/20 08:53	Air Canister (6-Liter) #1118
200-53449-2	SV-02	Air	04/16/20 16:43	04/20/20 08:53	Air Canister (6-Liter) #5156
200-53449-3	SV-03	Air	04/16/20 16:51	04/20/20 08:53	Air Canister (6-Liter) #3541
200-53449-4	SV-04	Air	04/16/20 16:28	04/20/20 08:53	Air Canister (6-Liter) #4008
200-53449-5	SV-05	Air	04/16/20 16:36	04/20/20 08:53	Air Canister (6-Liter) #3563
200-53449-6	SV-08	Air	04/16/20 15:43	04/20/20 08:53	Air Canister (6-Liter) #5165
200-53449-7	SV-09	Air	04/16/20 17:01	04/20/20 08:53	Air Canister (6-Liter) #5614
200-53449-8	SV-10	Air	04/16/20 16:37	04/20/20 08:53	Air Canister (6-Liter) #6019
200-53449-9	OUTDOOR AIR	Air	04/16/20 16:17	04/20/20 08:53	Air Canister (6-Liter) #4439

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-168789-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-168789-1	MW-1D (12-14)	Solid	04/17/20 13:08	04/17/20 16:52	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-168791-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-168791-1	MW-15 (4-6)	Solid	04/16/20 12:45	04/17/20 10:10	
480-168791-2	MW-16 (14-16)	Solid	04/16/20 15:54	04/17/20 10:10	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-168873-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-168873-1	MW-18 (14-16)	Solid	04/20/20 13:40	04/21/20 11:35	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-168915-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-168915-1	MW-17 (8-10)	Solid	04/21/20 11:35	04/22/20 12:00	
480-168915-2	Blind Dup #1	Solid	04/21/20 07:00	04/22/20 12:00	
480-168915-3	MW-19 (12-14)	Solid	04/21/20 11:35	04/22/20 12:00	
480-168915-4	TW-1	Water	04/21/20 17:07	04/22/20 12:00	
480-168915-5	TW-2	Water	04/21/20 18:19	04/22/20 12:00	
480-168915-6	TW-3	Water	04/21/20 18:46	04/22/20 12:00	
480-168915-7	Trip Blank	Water	04/21/20 00:00	04/22/20 12:00	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169000-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169000-1	SB-23 (10-12)	Solid	04/22/20 15:39	04/23/20 09:30	
480-169000-2	SB-25 (12-16)	Solid	04/22/20 15:28	04/23/20 09:30	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169003-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169003-1	MW-20 (8-12)	Solid	04/22/20 13:45	04/23/20 09:30	
480-169003-2	MW-21 (8-12)	Solid	04/22/20 13:05	04/23/20 09:30	
480-169003-3	SB-27 (4-8)	Solid	04/22/20 13:30	04/23/20 09:30	
480-169003-4	SB-28 (4-8)	Solid	04/22/20 14:00	04/23/20 09:30	
480-169003-5	SB-29 (8-11)	Solid	04/22/20 14:15	04/23/20 09:30	
480-169003-6	SB-30 (12-16)	Solid	04/22/20 12:30	04/23/20 09:30	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169085-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169085-1	SB-15 (12-14)	Solid	04/23/20 15:46	04/24/20 09:30	
480-169085-2	SB-19 (2-4)	Solid	04/23/20 15:37	04/24/20 09:30	
480-169085-3	SB-19 (16-18)	Solid	04/23/20 15:40	04/24/20 09:30	
480-169085-4	SB-21 (16-18)	Solid	04/23/20 15:50	04/24/20 09:30	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169102-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169102-1	SB-16 (10-12)	Solid	04/24/20 13:32	04/24/20 17:02	
480-169102-2	SB-17 (10-12)	Solid	04/24/20 13:49	04/24/20 17:02	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169174-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169174-1	SB-18 (0.5-2.0)	Solid	04/27/20 14:58	04/28/20 11:20	
480-169174-2	SB-18 (6-8)	Solid	04/27/20 14:55	04/28/20 11:20	
480-169174-3	SB-20 (8-10)	Solid	04/27/20 14:48	04/28/20 11:20	
480-169174-4	SB-22 (2-4)	Solid	04/27/20 15:09	04/28/20 11:20	
480-169174-5	SB-22 (6-8)	Solid	04/27/20 15:04	04/28/20 11:20	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169243-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169243-1	S-1 (0-2)	Solid	04/28/20 13:32	04/29/20 13:10	
480-169243-2	NS-1 (2-12)	Solid	04/28/20 13:21	04/29/20 13:10	
480-169243-3	Blind Dup 3	Solid	04/28/20 17:00	04/29/20 13:10	
480-169243-4	S-2 (0-2)	Solid	04/28/20 13:16	04/29/20 13:10	
480-169243-5	NS-2 (2-12)	Solid	04/28/20 13:05	04/29/20 13:10	
480-169243-6	SB-24 (2-4)	Solid	04/28/20 12:08	04/29/20 13:10	
480-169243-7	SB-26 (2-4)	Solid	04/28/20 11:52	04/29/20 13:10	
480-169243-8	Blind Dup 2	Solid	04/28/20 07:00	04/29/20 13:10	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169464-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169464-1	MW-4	Water	05/04/20 15:10	05/05/20 12:25	
480-169464-2	MW-9	Water	05/04/20 14:22	05/05/20 12:25	
480-169464-3	MW-20	Water	05/04/20 13:09	05/05/20 12:25	
480-169464-4	MW-21	Water	05/04/20 12:04	05/05/20 12:25	
480-169464-5	EQUIPMENT BLANK	Water	05/04/20 08:00	05/05/20 12:25	
480-169464-6	TRIP BLANK	Water	05/04/20 00:00	05/05/20 12:25	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169534-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169534-1	MW-5	Water	05/05/20 14:10	05/06/20 11:20	
480-169534-2	MW-7	Water	05/05/20 11:52	05/06/20 11:20	
480-169534-3	MW-10A	Water	05/05/20 10:08	05/06/20 11:20	
480-169534-4	MW-11	Water	05/05/20 10:45	05/06/20 11:20	
480-169534-5	BLIND DUP 1	Water	05/05/20 07:00	05/06/20 11:20	
480-169534-6	MW-15	Water	05/05/20 13:10	05/06/20 11:20	
480-169534-7	MW-17	Water	05/05/20 15:08	05/06/20 11:20	
480-169534-8	TRIP BLANK	Water	05/05/20 00:00	05/06/20 11:20	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169687-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169687-1	MW-13	Water	05/07/20 21:50	05/08/20 12:30	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169763-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169763-1	MW-1	Water	05/06/20 14:43	05/07/20 10:37	
480-169763-2	MW-2	Water	05/06/20 11:34	05/07/20 10:37	
480-169763-3	MW-6	Water	05/06/20 10:10	05/07/20 10:37	
480-169763-4	MW-8	Water	05/06/20 09:27	05/07/20 10:37	
480-169763-5	MW-16	Water	05/06/20 13:54	05/07/20 10:37	
480-169763-6	MW-19	Water	05/06/20 12:27	05/07/20 10:37	
480-169763-7	BLIND DUP #2	Water	05/06/20 07:00	05/07/20 10:37	
480-169763-8	TRIP BLANK	Water	05/06/20 00:00	05/07/20 10:37	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-169765-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-169765-1	MW-3	Water	05/07/20 18:58	05/08/20 10:37	
480-169765-2	MW-12	Water	05/07/20 20:42	05/08/20 10:37	
480-169765-3	MW-13	Water	05/07/20 20:50	05/08/20 10:37	
480-169765-4	MW-14	Water	05/07/20 10:49	05/08/20 10:37	
480-169765-5	MW-18	Water	05/07/20 17:20	05/08/20 10:37	
480-169765-6	TRIP BLANK	Water	05/07/20 00:00	05/08/20 10:37	

Sample Summary

Client: Benchmark Env. Eng. & Science, PLLC
Project/Site: Jamestown, NY BCP Site

Job ID: 480-170853-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-170853-1	TW-4	Water	06/05/20 12:39	06/05/20 15:30	
480-170853-2	TB	Water	06/05/20 00:00	06/05/20 15:30	

APPENDIX G

FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS

Appendix 3C Fish and Wildlife Resources Impact Analysis Decision Key		If YES Go to:	If NO Go to:
1.	Is the site or area of concern a discharge or spill event?	13	2
2.	Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas.	13	3
3.	Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?	4	9
4.	Does the site contain habitat of an endangered, threatened or special concern species?	Section 3.10.1	5
5.	Has the contamination gone off-site?	6	14
6.	Is there any discharge or erosion of contamination to surface water or the potential for discharge or erosion of contamination?	7	14
7.	Are the site contaminants PCBs, pesticides or other persistent, bioaccumulable substances?	Section 3.10.1	8
8.	Does contamination exist at concentrations that could exceed ecological impact SCGs or be toxic to aquatic life if discharged to surface water?	Section 3.10.1	14
9.	Does the site or any adjacent or downgradient property contain any of the following resources? i. Any endangered, threatened or special concern species or rare plants or their habitat ii. Any DEC designated significant habitats or rare NYS Ecological Communities iii. Tidal or freshwater wetlands iv. Stream, creek or river v. Pond, lake, lagoon vi. Drainage ditch or channel vii. Other surface water feature viii. Other marine or freshwater habitat ix. Forest x. Grassland or grassy field xi. Parkland or woodland xii. Shrubby area xiii. Urban wildlife habitat xiv. Other terrestrial habitat	11	10
10.	Is the lack of resources due to the contamination?	3.10.1	14
11.	Is the contamination a localized source which has not migrated and will not migrate from the source to impact any on-site or off-site resources?	14	12
12.	Does the site have widespread surface soil contamination that is not confined under and around buildings or paved areas?	Section 3.10.1	12
13.	Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource? (See #9 for list of potential resources. Contact DEC for information regarding endangered species.)	Section 3.10.1	14
14.	No Fish and Wildlife Resources Impact Analysis needed.		