Alternative Analysis Report

Queen City Landing Site
975 & 1005 Fuhrmann Boulevard
Buffalo, New York
BCP Site No. C915304

May 2018 0424-017-001

Prepared For:

QUEEN CITY LANDING LLC

Prepared By:

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
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ALTERNATIVES ANALYSIS REPORT

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BUFFALO, NEW YORK
BCP SITE NO. C915304

May 2018 0424-017-001

Prepared for:

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CERTIFICATION

I, Thomas H. Forbes, certify that I am currently a NYS registered professional engineer and that this Alternative Analysis Report (AAR) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10). Data and information from the Remedial Investigation (RI), which was completed under the guidance of a Qualified Environmental Professional as defined by 6 NYCRR Part 375 (Daniel E. Riker, P.G.) affiliated with C&S Engineers, was used to develop this ARR. Although the RI references work done prior to this certifying engineer's involvement, I certify that I have reviewed the Remedial Investigation Work Plan ("RIWP"), have compared the work, data, and information referenced in the RI Report and approved addenda thereto, (and the Data Usability Summary Reports certifying the data gathered) resulting from implementation of the Department-approved Remedial Investigation Work Plan, and have found that the RI completed in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and the Department-approved RIWP.

Date: 5/31/18

Seal:

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1.0 INTRODUCTION

Queen City Landing, LLC (QCL) entered into a Brownfield Cleanup Agreement (BCA) with New York State Department of Environmental Conservation (NYSDEC) on June 29, 2016 (BCA Index No. C915304-06-16) for the Queen City Landing project (BCP Site No. C915304) located at 975 and 1005 Fuhrmann Boulevard in the City of Buffalo, New York (Site; see Figures 1 and 2) to remediate and redevelop the Site.

This Alternative Analysis Report (AAR) was prepared, on behalf of QCL, by Benchmark Environmental Engineering and Science, PLLC (Benchmark) to provide remedial alternative evaluations. Previously, a draft Remedial Investigation, Alternative Analysis Report, and Remedial Work Plan Report (RI/AAR/RWP; Ref. 1) was prepared and submitted to New York State Department of Environmental Conservation (NYSDEC) for review and comment by C&S Engineers, Inc. (C&S) on behalf of QCL. In May 2017, Benchmark was substituted for C&S to complete the remainder of the Brownfield Cleanup Program (BCP) Site project, which includes preparation of this AAR. We request the previously submitted AAR be disregarded.

The Site is proposed to be redeveloped with a mixed residential/commercial use structure. While the Site is now vacant, it was previously occupied by a large manufacturing building, a small office building, two connected parking lots, and a former water treatment facility. The approximately 7.72-acre parcel has a significant amount of fill present that was historically placed into the Outer Harbor to facilitate shipping access. Therefore, the majority of the Site is surrounded by Lake Erie (Buffalo Outer Harbor) and comprised of made-land consisting of construction/structural and urban fill materials. The Site generally slopes to the south-southwest, although certain minor variations in elevation are present.

Demolition of the existing structures occurred to facilitate the performance of the RI under the building and redevelopment of the Site. Redevelopment will include the construction of a new multi-story apartment building; covered parking area for residents, surface parking for visitors, roadway, and bike path providing public waterfront access. The building will house a mix of one- and two-bedroom luxury apartments. Commercial use (restaurants) are also planned for construction within the building.

1.1 Background

In February 2008, WSP Environmental Services conducted a Phase II Environmental Site Assessment (ESA), which identified semi-volatile organic compound (SVOC) and metal contamination in the fill at the Site. In 2015, AMD Environmental conducted a Phase II ESA to characterize subsurface soil, water in the facility basement, construction and demolition materials, and the former water treatment area. SVOC and metal contamination was detected in the soil/fill, and petroleum contamination was encountered proximate to a diesel fuel underground storage tanks (USTs).

In March 2016, C&S conducted a limited supplemental sampling program involving groundwater monitoring well installation, which was conducted to further characterize soil and groundwater conditions. SVOCs and metals were detected at concentrations above the NYSDEC's soil cleanup objectives (SCOs) and Technical and Operational Guidance Series (TOGS). The NYSDEC relied on these results to approve the Site's eligibility for the BCP.

In December 2016, C&S prepared a Remedial Investigation/Interim Remedial Measures/Alternative Analysis (RI/IRM/AA) Work Plan (Ref. 2) to describe the proposed approach to more thoroughly assess site contaminant conditions and address the petroleum contamination identified in the northwestern portion of the Site. The January/February 2017 RI included the performance of a geophysical survey and the sampling of surface soil/fill, subsurface fill material and native soil, groundwater, and outdoor air.

From August 2017 through October 2017, the IRM activities were completed to remove the USTs present in the northwestern portion of the Site and associated petroleum contamination. The IRM activities were documented in the Benchmark IRM report (Ref. 3).

In September 2017 and December 2017, additional investigation activities were completed at the request of NYSDEC to address validation issues associated with VOC data generated from the initial investigation completed by others and to delineate areas where elevated SVOCs and metals were present, respectively. The delineation work was done under an NYSDEC-approved Additional Hotspot Sampling & Soil Disposal Work Plan (Additional Sampling Work Plan, Ref. 4). The September and December 2017 activities were documented in Benchmark's Remedial Investigation Submittal (RI Submittal, Ref. 5).

1.2 Purpose

This AAR has been prepared on behalf of Queen City Landing, LLC to identify and evaluate effective and implementable remedial alternatives for the Site; and to develop a recommended final remedial approach that is protective of human health and the environment. Information and data generated by C&S, Benchmark, and others during the RI and previous investigations has been used and relied upon to prepare the AAR. Benchmark has reviewed the RI/IRM/AA Work Plan, information referenced in the RI resulting from implementation of the RI/IRM/AA Work Plan, and the Data Usability Summary Report (DUSR) describing the reliability of the data gathered)[1], and have found that the RI was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10, Ref. 6) and the Department-approved work plan. The AAR provides sufficient detail to support the decision making process relative to remedial actions for the Site.

1.3 Report Organization

This AAR contains the following sections.

- Section 1.0 presents the Site background.
- Section 2.0 presents a summary of the RI findings, describes contaminant fate and transport; and provides a qualitative human health exposure assessment, and fish and wildlife resources impact assessment.
- Section 3.0 develops remedial action objectives; evaluates the future use of the Site; provides an estimate of contaminant volume; develops and screens remedial alternatives; evaluates the remedial alternatives; and presents the preferred remedial alternative for the Site.
- Section 4.0 describes the post-remedial requirements that will be implemented as a component of the Site remedy.
- Section 5.0 presents cited references.

[1] Certain issues raised in the DUSR concerning the reliability of volatile organic compound (VOC) data were addressed through supplemental confirmatory investigation as discussed herein.

2.0 REMEDIAL INVESTIGATION FINDINGS

This section summarizes Benchmark's review of the RI presented in the draft RI/AAR/RWP Report prepared by C&S, Benchmark's response to NYSDEC comments (letter dated May 19, 2017) on the draft RI/AA/RWP, and the additional investigation activities which were completed by Benchmark which were all included in the Benchmark RI Submittal (Ref. 5).

2.1 Soil/Fill

2.1.1 Geophysical Survey

A geophysical survey was conducted across the Site to investigate the possible presence of buried metal materials and debris. No significant anomalies were identified that suggested additional underground storage tanks or other metal anomalies exist on the Site.

2.1.2 Site Geology

The following general material types were encountered at the Site:

- Urban Fill: The heterogeneous urban fill is present at the Site at depths ranging from 8 to 17 feet below ground surface (fbgs). The urban fill material at the Site contains crushed rock, sand, silt, clay, plastics, construction debris, lumber, ash/cinders, ceramics, bricks, and metal.
- Construction Fill: The construction fill placed in Lake Erie to create the majority of the Site consists of fine to coarse sand. The construction fill was found in alternating intervals with urban fill and clay layers throughout the Site, but was typically the last layer before native soil was encountered. However, the construction fill was not encountered in every boring. Generally, the construction fill was encountered at greater depths on the western-most portion of the Site and shallower depths on the eastern portion. In the area the main structure was historically located, sand was encountered at depths of 4 to 9.5 fbgs until refusal or the end of the borings.

- Native Soil: Native soil was encountered in borings in the eastern portion of the Site beneath the construction fill. The native soil consisted of silty clay-organic clays of medium to high plasticity and variable silt content with a grey appearance. Native soils were only encountered on the far eastern side of the Site at depths of 9.6 to 13.2 fbgs.

2.1.3 Surface Soil/Fill

A total of 11 surface soil/fill samples and one duplicate were collected during the RI.

VOCs were detected in six (6) surface soil/fill samples. Three (3) sample locations contained multiple compounds and three (3) samples contained a single VOC. Two (2) samples contained acetone at concentrations 0.614 mg/kg (D1-SS) and 0.199 mg/kg (F5-SS) that exceeded their respective Unrestricted Use SCOs (USCOs) but were below their respective RRSCOs. There were no RRSCO exceedances for VOCs in the surface soil/fill samples collected.

SVOCs were detected in ten (10) of the surface soil/fill samples. Samples generally contained multiple compound detections, primarily polycyclic aromatic hydrocarbons (PAHs). RRSCOs exceedances are identified on Figure 3.

- Benzo(a)anthracene was detected in six (6) samples at concentrations above its respective RRSCO (1 mg/kg) with one (1) location above its Industrial SCO (ISCO, 11 mg/kg), A7-SS (31 mg/kg).
- Benzo(a)pyrene was detected in five (5) samples at concentrations above its respective ISCO (1.1 mg/kg).
- Benzo(b)fluoranthene was detected in five (5) samples at concentrations above its respective RRSCO (1 mg/kg) with one location above its ISCO (11 mg/kg), A7-SS (38.1 mg/kg).
- Benzo(k)fluoranthene was detected in two (2) samples at concentrations above its respective RRSCO (3.9 mg/kg): A7-SS (31.4 mg/kg) and F6-SS (4.55 mg/kg).
- Chrysene was detected in two (2) samples at concentrations above its respective RRSCO (3.9 mg/kg): A7-SS (42.7 mg/kg) and F6-SS (5.59 mg/kg).

- Dibenz(a,h)anthracene was detected in four (4) sample locations at concentrations above its respective RRSCO (0.33 mg/kg) and two (2) of those locations exceed their respective ISCO (1.1 mg/kg) A7-SS (10.9 mg/kg) and F6-SS (1.66 mg/kg).
- Indeno(1,2,3-cd)pyrene was detected in six (6) samples at concentrations above its respective RRSCO (0.5 mg/kg) with one (1) location above its ISCO (11 mg/kg), A7-SS (19.8 mg/kg).

PCBs were detected in one (1) sample, F5-SS (0.0307 mg/kg) below its respective USCO (0.1 mg/kg) and RRSCO (1 mg/kg).

Pesticides were detected in ten (10) surface soil samples. Six analytes (4,4'-DDE, 4,4'-DDT, aldrin, and dieldrin) were detected at concentrations exceeding their USCOs but below the RRSCOs.

Metal analytes were detected in the eleven (11) samples. RRSCO exceedances were limited to total chromium at F6-SS (712 mg/kg) and manganese (2,000 mg/kg) at F2-SS (2,460 mg/kg), and F3-SS (2,360 mg/kg) [Hexavalent chromium analysis completed on the surface soil/fill samples were non-detect.]. Manganese was also detected above its respective ISCO (10,000 mg/kg) at F6-SS (11,600 mg/kg). RRSCOs exceedances are identified on Figure 4.

NYSDEC requested additional sampling in the area of F6-SS to further assess the elevated chromium and manganese concentrations detected. QCL agreed to additional work in this area as outlined in the Additional Sampling Work Plan. The area of the Site where F6-SS was located was graded by the site contractor to prepare the northern property boundary to be keyed into the cover system proposed to be installed. The grading cut the former ground surface in the vicinity of former F6-SS by approximately 2 feet. The soil/fill that was graded, is now stockpiled and slated for off-site landfill disposal in early 2018 when the winter weather conditions improve. Once the stockpile is removed, a composite surface soil/fill sample will be collected in the vicinity of the former F6-SS (designated F6-SSR Comp) because the soil/fill associated with F6-SS is contained within the stockpile. This sample will be analyzed for chromium and manganese as outlined in the Additional Hotspot Work Plan. This area and estimated volume of material to be disposed (240-280 tons) has been included in Section 3.4 of this AAR. Based on the analytical results of F6-SSR Comp, it will be determined if additional remedial action is necessary beyond stockpile disposal.

Boundary Surface Soil/Fill Samples

Four (4) surface soil/fill samples were collected at the eastern and western Site boundaries with two (2) samples collected from each boundary.

SVOCs were detected in the four (4) boundary surface soil/fill samples. Samples generally contained multiple compound detections, primarily polycyclic aromatic hydrocarbons (PAHs). The RRSCOs exceedances are identified on Figure 3.

- Benzo(a)anthracene was detected in three (3) samples at concentrations above its respective RRSCO with one (1) location above its ISCO, Boundary SS-2 (33.3 mg/kg).
- Benzo(a)pyrene was detected in three (3) samples at concentrations above its respective ISCO.
- Benzo(b)fluoranthene was detected in three (3) samples at concentrations above its respective RRSCO with one (1) location above its ISCO, Boundary SS-2 (52.3 mg/kg).
- Benzo(k)fluoranthene was detected in one (1) sample at a concentration above its respective RRSCO: Boundary SS-2 (32.3 mg/kg).
- Chrysene was detected in one (1) sample at a concentration above its respective RRSCO: Boundary SS-2 (51 mg/kg).
- Dibenz(a,h)anthracene was detected in three (3) sample locations at concentrations above its respective RRSCO of which one exceed its respective ISCO (Boundary SS-2, 8.72 mg/kg).
- Fluoranthene was detected in one (1) sample location above its respective RRSCO (100 mg/kg), Boundary SS-2 at a concentration of 117 mg/kg.
- Indeno(1,2,3-cd)pyrene was detected in three (3) samples at concentrations above its respective RRSCO with one (1) location above its ISCO, Boundary SS-2 (41 mg/kg).

Due to the elevated total SVOC concentrations (greater than 500 mg/kg) detected at Boundary SS-2, NYSDEC request additional soil/fill sampling be completed off-site between the eastern property boundary and the bike path along Fuhrmann Boulevard (see Figure 9) as outlined in the Additional Hotspot Work Plan. Two (2) surface soil/fill

samples, SS-2 (0-2") North and SS-2 (0-2") South, and two (2) subsurface soil/fill samples, SS-2 North (2"-12") and SS-2 South (2"-12") were collected and analyzed for SVOCs and metals.

In the two (2) off-site surface soil/fill samples collected from 0 to 2-inches below grade, four (4) SVOCs were detected above their respective RRSCOs of which one (1) SVOC (benzo(a) pyrene) was detected slightly above its respective ISCO (see Table 2).

In the two (2) soil/fill samples collected from 2-inch to 12-inch below grade, no SVOCs or metal analytes were detected above their respective USCOs in sample SS-2 North (2"-12"); but two (2) SVOCs were detected slightly above their respective RRSCOs (benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene); no metal analytes were detected above their respective USCOs (see Table 2). Total SVOCs detected at the sample locations were as follows.

SS-2 (0-2") North:	19.7 ppm
SS-2 North (2"-12"):	9 ppm
SS-2 (0-2") South:	19.4 ppm
SS-2 South (2"-12"):	12 ppm

Based on the results of the additional sampling completed, the elevated PAHs identified at Boundary SS-2 do not appear to extend off-site, but those present in the vicinity of Boundary-SS2 will require remedial action. This area and estimated volume of material to be disposed (less than 5 cubic yards) has been included in Section 3.4 of this AAR as requiring remedial action.

PCBs were not detected above method detection limits.

Pesticides were detected in the four (4) boundary surface soil samples but at concentrations below their RRSCOs.

Metal analytes were detected in the four (4) boundary samples but at concentrations below their respective RRSCOs. Metals analytes were also detected in off-site soil/fill samples collected from 0 to-2 inches and 2-inches to 12-inches but at concentrations below their respective RRSCOs.

In general, the surface soil/fill samples contained SVOCs, specifically PAHs, and two metals (chromium and manganese) at concentrations above the 6NYCRR Part 375 RRSCOs. Benzo(a)pyrene was detected at eight (8) surface soil/fill sample locations above its

respective ISCO, dibenz(a,h)anthracene was detected at three (3) surface soil sample locations above its respective ISCO, and the following compounds at two (2) surface soil sample locations above their respective ISCOs: benzo(a)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-cd))pyrene. Manganese was the only metal analyte detected at a concentration above its ISCO in one (1) surface soil sample, F6-SS and the soil/fill from this location has been stockpiled for disposal, as discussed above.

The concentrations of the detected compounds and analytes were consistent with the urban setting of the Site, the historical use of the Site for manufacturing purposes, and the presence of urban fill across the Site. However, due to the elevated PAHs detected at Boundary SS-2, remedial action will be required.

2.1.4 Subsurface Soil/Fill

A total of 71 urban and construction fill subsurface soil samples were collected by C&S and 15 subsurface soil samples by Benchmark during the RI.

No VOCs were detected above their respective RRSCOs at the Site.

SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs), were detected in the urban fill and construction fill materials at the Site. RRSCOs exceedances are identified on Figure 5 and discussed below.

- Benzo(a)anthracene was detected in 21 samples at concentrations above its respective RRSCO (1 mg/kg) with four (4) locations above its ISCO (11 mg/kg). The ISCO exceedances as follows: C5-11ft, 22.2 mg/kg; D7-10-11ft, 49.4 mg/kg; E2-7.5-8.5ft, 13.6 mg/kg; E5-3-4ft, 16.5 mg/kg.
- Benzo(a)pyrene was detected in 17 subsurface samples at concentrations above its respective RRSCO (1 mg/kg) with 13 exceeding its ISCO (1.1 mg/kg).
- Benzo(b)fluoranthene was detected in 18 samples at concentrations above its respective RRSCO (1 mg/kg) with two (2) locations above its ISCO (11 mg/kg), C5-11ft (15.8 mg/kg) and D7-10-11ft (30.2 mg/kg).
- Benzo(k)fluoranthene was detected in five (5) samples at concentrations above its respective RRSCO (3.9 mg/kg) and the exceedances ranged from 4.73 mg/kg (MW7-12-14ft) to 38.5 mg/kg (D7-10-11ft).
- Chrysene was detected in five (5) samples at concentrations above its respective RRSCO (3.9 mg/kg) and exceedances ranged in concentration from 6.83 mg/kg (MW7-12-14ft) to 43.6 mg/kg (D7-10-11ft).
- Dibenz(a,h)anthracene was detected in nine (9) sample locations at concentrations above its respective RRSCO (0.33 mg/kg) of which four (4) locations exceeds the

ISCO (1.1 mg/kg): C5-11ft (4.1 mg/kg), D7-10-11ft (11 mg/kg), E2-7.5-8.5ft (2.7 mg/kg), and E5-3-4ft (3.97 mg/kg).

- Fluoranthene was detected in one (1) sample location, D7-10-11ft (127 mg/kg) above its RRSCO (100 mg/kg).
- Indeno(1,2,3-cd)pyrene was detected in 21 samples at concentrations above its respective RRSCO (0.5 mg/kg) with one (1) location above its ISCO (11 mg/kg), D7-10-11ft (13.5 mg/kg).
- Naphthalene was detected in one (1) sample, D7-10-11ft, at 107 mg/kg which exceeds its RRSCO (100 mg/kg).
- Phenanthrene was detected in one (1) sample, D7-10-11ft, at 177 mg/kg which exceeds its RRSCO (100 mg/kg).

PCBs were detected in three (3) samples at concentrations below its respective USCO (0.1 mg/kg).

Pesticides were detected in the 43 samples but at concentrations below their respective RRSCOs.

Metal analytes were detected in the subsurface soil/fill samples. RRSCOs exceedances are identified on Figure 6 and discussed below.

- Arsenic was detected in five (5) samples at concentrations above its respective ISCO (16 mg/kg): MW6-4.5-7 (16.3 mg/kg), A9-7-8ft (16.2 mg/kg), C1-6-7ft (16.6 mg/kg), D8-5-8ft (24 mg/kg), and E8-7-8ft (18.9 mg/kg).
- Copper was detected in two (2) sample at concentrations above its respective CSCO (270 mg/kg): MW1-10-12ft (278 mg/kg) and E8-7-8ft (280 mg/kg).
- Lead was detected in four (4) samples at concentrations above its respective RRSCO (400 mg/kg): C1-6-7ft (423 mg/kg), D8-5-8ft (518 mg/kg), E8-7-8ft (480 mg/kg), and F3-3ft (417 mg/kg).
- Mercury was detected in six (6) samples at concentrations above its respective RRSCO (0.81 mg/kg).

The subsurface soil/fill samples contained SVOCs, specifically PAHs, and metals (arsenic, chromium, mercury, manganese, lead, and copper) at concentrations above their respective RRSCOs. The following compounds and analyte were detected above their respective ISCOs:

Benzo(a)anthracene – 4 locations
Benzo(a)pyrene – 12 locations
Benzo(b)fluoranthene – 2 locations
Dibenz(a,h)anthracene – 4 locations
Indeno(1,2,3-cd)pyrene – 1 location
Arsenic – 4 locations

The concentrations of the detected compounds and analytes are consistent with the urban setting, the historical use of the Site for manufacturing purposes, and the presence of urban fill across the Site. The highest contaminant concentrations were detected within the urban fill of which one location, D7-10-11 ft, had total SVOC concentrations greater than 500 mg/kg. NYSDEC requested additional sampling be complete around D7 to determine the extent of contamination as outlined in the Additional Hotspot Work plan. Six (6) test pits were completed by Benchmark in December 2017. Four (4) test pits (TP-D7-North-1, TP-D7-South-1, TP-D7-East-1, and TP-D7-West-1) were completed approximately 15 feet away from the initial D7 location in the four (4) cardinal directions.

Evidence of petroleum contamination (e.g., visual, olfactory, and elevated PID readings) was identified at TP-D7-South-1 and TP-D7-West-1 at depths starting at 5 to 6 feet below grade and extended to approximately 10 feet below grade. No samples were collected from the impacted areas as it will require remedial action. A sample was collected from TP-D7-South-1, 10-12 feet, as impacts significantly decreased and PID readings were less than 10 ppm. Acetone was detected above its respective USCO. No other VOCs or SVOCs were detected above their respective USCOs.

Two (2) additional step-back test pits were completed 15 feet south and west (TP-D7-South-2 and TP-D7-West-2, respectively). No evidence (visual, olfactory or PID readings) of impacts were noted at TP-D7-South-2. No samples were collected. Slight petroleum odors, staining and PID readings (10 to 20 ppm) were observed at TP-D7-West-2. Three (3) sample intervals were sampled: 3-5 feet (VOCs and SVOCs); 5 to 7 feet (VOCs); and 7 to 9 feet (SVOCs). No compounds were detected above their respective USCOs in the samples collected from TP-D7-West-2 (3-5 feet) or TP-D7-West-2 (5 to 7

feet). Four (4) SVOCs were detected above their respective RRSCOs in TP-D7-West-2 (7 to 9 feet). The total SVOCs detected in this sample were approximately 30 mg/kg. The results of the addition work in the vicinity of D7 are included on Table 3. This area and estimated volume of material to be disposed (300 cubic yards) has been included in Section 3.4 of this AAR as requiring remedial action.

2.1.4.1 Waste Characterization

Six (6) waste characterization samples were collected from the fill for disposal purposes by C&S as part of the RI. Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP SVOCs, TCLP pesticides/ herbicides, and polychlorinated biphenyls (PCBs) were not detected. One or more TCLP metals were detected in all six waste characterization samples. Barium and lead were detected at concentrations below the EPA Regulatory Limit. The samples did not exhibit the characteristics of corrosivity, ignitability or reactivity.

As part of the petroleum-impacted soil/fill IRM activities and Additional Hotspot Work Plan activities, Benchmark collected nine (9) waste characterization samples, six (6) for the IRM and three (3) for materials to be disposed as part of the remedial action in 2018 (petroleum impacts in the vicinity of D-7 and soil/fill stockpile in the vicinity of F6-SS).

2.1.4.2 Petroleum Spill Area – Completed in 2017 as IRM

During the 2015 Phase II ESA (Ref. 7), an UST was discovered adjacent to a demolished building floor slab in the northwestern portion of the Site. It was reported that, visible petroleum contamination was observed during the test pit excavation around the floor slab. Soil samples collected from the test pits indicated that VOC and SVOC concentrations exceed RRSCOs, with one (1) soil sample containing benzo(a)pyrene at a concentration exceeding its ISCO. NYSDEC was contacted and Spill Number 1509303 was assigned to the Site. The Spill Number was closed in October 2016, without remedial action, after QCL entered into a BCA with NYSDEC to investigate and remediate the Site under the BCP.

Seven test pits were excavated around the known petroleum spill area by C&S to define the limits of excavation. Significant staining, petroleum-like odors, and elevated PID (i.e., 20-30 ppm) were noted in test pit TP-5. No visual or olfactory evidence of petroleum contamination was observed, and no elevated PID measurements were noted in the remaining test pits. Based on these observations, samples were collected from the six test

pits to confirm the lack of petroleum impacts and analyzed for VOCs, SVOCs, PCBs, pesticides, metals, mercury, total cyanide, and hexavalent chromium (in one of six samples). Several SVOCs were detected at concentrations above their respective RRSCOs at TP-6-5-6 ft and benzo(a)anthracene was also detected above its RRSCO at TP-4-4-6 ft. Mercury was detected above its RRSCO at TP-2-6-7 ft and TP-6-5-6 ft.

The petroleum spill area (USTs and petroleum contaminated soil/fill) was addressed by QCL between August and October 2017. The IRM activities identified three (3) 5,000 gallon USTs which were emptied, removed from the ground and disposed, in addition to 4,956 tons of petroleum impacted soil/fill. The IRM activities were documented in an IRM Report prepared by Benchmark and submitted to NYSDEC.

No VOCs were detected in the soil/fill confirmatory samples collected at concentrations above their respective RRSCOs. SVOCs were detected in the soil/fill confirmatory samples collected from the sidewalls and bottom of excavation, and individual SVOCs were detected above their respective RRSCOs. No evidence of visual, olfactory or elevated PID readings were noted at the locations when the samples were collected. Three (3) sample locations were excavated to remove additional soil/fill due to the elevated totals SVOCs detected (NW-4 (194 mg/kg), EW-4 (346 mg/kg), and WW-1 (88.9 mg/kg)) and were resampled. Results of the resampled location has substantially lower total SVOCs but still contained some RRSCO exceedances.

The total SVOCs detected in the confirmatory samples ranged from non-detect (3 sample locations) to 36.3 mg/kg (B-6) with an average total SVOC concentration of 9.4 mg/kg. Forty percent (40%) of the confirmatory samples from the final excavation limits had individual SVOCs above their respective RRSCO. These confirmatory sample results are consistent with the results of the urban fill, present throughout the BCP Site, sampled as part of the Remedial Investigation (RI). Of the 15 surface samples and 52 subsurface samples collected from material identified as urban fill, outside of the petroleum-impacted excavation, 10 of the surface samples and 21 of the subsurface samples had exceedances of their respective RRSCOs, or 67% and 40%, respectively. The detected concentrations of SVOCs in the confirmatory samples analyzed as part of the IRM activities can be attributed to the urban fill present throughout the Site which was likely placed during its development into the inner harbor. Evidence of petroleum impacts (visual, olfactory, PID readings) were not observed.

2.2 Groundwater

Groundwater is present at approximately 5 to 7 fbgs. Due to the presence of Lake Erie on three sides of the Site, the groundwater flow direction is generally from east to west with minor components of flow to the north (in the northern portion of the Site) and to the south (in the southern portions of the Site).

Site groundwater monitoring wells were sampled in March 2016 (prior to RI) and February 2017 (as part of RI) to characterize site-wide groundwater conditions and help determine groundwater flow. Eight (8) groundwater monitoring wells were sampled in the first event. After accidental demolition of five (5) wells (MW-2, MW-4, MW-6, MW-7, and MW-8), six (6) new wells were installed, five (5) in the original well locations and one (1) new location (MW-9). Nine (9) groundwater monitoring wells were sampled in the second event as part of the RI.

Significant groundwater contamination was absent and a limited number of analytes exceeded the NYSDEC Class GA groundwater quality standards and guidance values (GWQS/GVs, see Figure 7). Benzene (MW-1), methyl tert butyl ether (MW-7), naphthalene (MW-7), dichlorodifluoromethane (MW-9), and acetone (MW-9) were detected during one or both events, each detected at only one (1) discrete well location, at concentrations above GWQS/GVs. Three (3) SVOCs (PAHs: benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene) were detected in the nine wells at concentrations above their respective GWQS/GVs. During the first event, lead (2 samples) and manganese (4 samples) were detected at concentrations above GWQS/GVs. During the second event, iron (8 samples), magnesium (5 samples), manganese (3 samples), and sodium (8 samples) were detected at concentrations above GWQS/GVs. No PCBs or pesticides were detected in any groundwater samples.

Five (5) sites have been identified, within about 1-mile of the QCL Site which contain similar site conditions: Buffalo Outer Harbor Site (NYS Superfund Site 915026, Ref. 9); Tift Farms (NYS Superfund Site 915072, Ref. 10); Small Boat Harbor (NYS Superfund Site 915127, Ref. 11); 225 Fuhrmann Boulevard (Wilkeson Point Park, Ref. 12); Buffalo Harbor State Park (Gallagher Beach, Ref. 13 and 14) and are located north, east, and south of the QCL Site.

Soil/fill and groundwater conditions identified at these sites are similar to QCL. Significant amounts of urban fill materials are present; and VOC, SVOC, and metals have

been detected in the subsurface soil/fill and/or groundwater at concentrations exceeding SCOs and GWQSs.

Although low level groundwater contamination is present at the Site, the concentrations present (less than 70 micrograms per liter (ug/l) for total VOCs and less than 30 ug/l for total SVOCs) do not warrant remedial action due to the extensive amount of fill present at the Site and in the Outer Harbor area and groundwater contamination present at other sites surrounding QCL. The metal analytes present in the groundwater (iron, magnesium, manganese, and sodium) are commonly found in urban areas, particularly in areas where significant fill material is present.

Additionally, groundwater in the City of Buffalo is not used for potable purposes.

2.3 Outdoor Air

Three (3) outdoor air samples (one (1) upwind and two (2) downwind) were collected to characterize current Site conditions. The intent of the sampling was to determine if the Site impacts air quality in the downwind direction.

Seven (7) different VOCs were detected in the three (3) outdoor air samples collected. Of the seven (7) VOCs detected, three (3) compounds: carbon tetrachloride, dichlorodifluoromethane and chloromethane were detected in all three (3) air samples, including the upwind sample. The concentrations of these compounds detected in the two (2) downwind samples (DW-1 and DW-2) were consistent with the upwind/background concentrations detected in the upwind sample (UW-1) and can be attributed to a background condition. Trichlorofluoromethane (1.2 ug/m^3) was detected in the upwind sample only and can be attributed to a background condition.

Acetone was detected in the two (2) downwind samples at concentrations of 2.66 ug/m^3 and 3.04 ug/m^3. Isopropanol (1.42 ug/m^3) and toluene (1.25 ug/m^3) were detected in one (1) downwind sample, DW-1. New York State Department of Health (NYSDOH) does not have outdoor air standards for comparative purposes. The detected concentration of these compounds is not considered to be of concern.

2.4 Data Usability Summary Reports

In general, the analysis conducted on the RI samples were in compliance with the required analytical protocols. Most sample results are usable as reports or with minor qualification which were reflected in the analytical summary tables. A portion of the VOC data collected and analyzed was rejected by the validator due to laboratory handling procedures. Specifically, sample aliquots were removed from the sample jar for other analysis (SVOCs, metals, PCBs, etc.) creating a headspace in the sample jar, prior to removing the VOC sample aliquot and performing the VOC analysis.

NYSDEC was made aware of the VOC analysis issue and requested additional samples be collected and analyzed for VOCs from previous RI locations to provide additional site coverage, and supplement the existing VOC data that was deemed acceptable. Benchmark, with NYSDEC-approval, recollected eight (8) VOC samples from five (5) locations previous sampled. The following samples were recollected.

RI Sample	**Supplemental Sample**
B9-10-11ft	BM9-10.5ft
C5-11ft	BMC5-11ft
D1-3-4ft	BMD1-3.5ft
E5-3-4ft	BME5-3.5ft
E5-15-16ft	BME5-15.5ft
F3-3ft	BMF3-3ft
F3-6.5-8ft	BMF3-7ft
F3-15ft	BMF3-15ft

The supplemental VOC data was sent to the validator for review and preparation of the DUSR. The analyses were conducted in compliance with the required analytical protocols. The sample results were considered usable either as reported or with minor qualification/edit. The results for l,4-dioxane were rejected in the samples due to methodology limitations. l,4-dioxane was not detected in these samples nor others from the Site and the rejection is consistent with other similar projects that have utilize USEPA Method 8260.

The VOC results from the supplemental sample did not identify VOCs above their respective RRSCOs. Although, there were low-level VOCs detected in samples that were

rejected for laboratory handling procedures, the detected/rejected concentrations were well below the RRSCOs, which is intended cleanup objective for the Site.

In addition to the VOCs data, the validators also rejected the following data:

- Pesticide results in sample MW5-9-12ft;
- Lead results in sample B2-2.5-4ft and its duplicate sample (DUP E-012617);
- Hexavalent chromium result in sample F3-3ft;
- Zinc results in 13 samples; and
- Mercury in nine (9) samples.

The rejected data are shown on the data tables with a red "R" qualifier and strikeout of the concentration.

It is Benchmark's opinion that the data generated as part of the RI conducted by C&S and the supplemental VOC data described above is sufficient in quantity and quality to assess the Site conditions, evaluate remedial alternatives and provide a proposed remedial strategy that will be protective to human health and the environment.

2.5 Contaminant Fate and Transport

The BCP Site is approximately 7.72 acres and being redeveloped for a mixed residential and commercial use. The contaminant fate and transport was evaluated based on the properties of the contaminant present and potential pathways for contaminants to migrate. The majority of the Site is asphalt, concrete and exposed fill material with some vegetative cover along the northern and eastern property lines

The potential exposure pathways are as follows:

- Surface Soil/Fill: Persons working at or near the Site and/or persons trespassing on the Site could be exposed to contaminants in the surface soil/fill via inhalation of airborne particles, incidental ingestion of impacted surface soil/fill, or dermal contact with the impacted surface soil/fill. The development of a Health and Safety Plan (HASP) to include appropriate personal protective equipment (PPE), dust suppression techniques, personal/air monitoring requirements would minimize the risk of exposure during future redevelopment activities.
- Subsurface Soil/Fill:

Construction workers, persons working at or near the Site, persons trespassing on the Site and environmental receptors could be exposed to contaminants during excavation of subsurface soil/fill associated with site construction activities. Potential exposure routes for these receptors include inhalation of contaminated dust, incidental ingestion contaminated soil/fill, and/or dermal contact with the contaminated soil/fill. The development of a HASP to include appropriate PPE, dust suppression techniques, personal/air monitoring requirements would minimize the risk of exposure to subsurface contaminants during future redevelopment activities.

- Groundwater: The Site and surrounding areas are serviced by a municipal (supplied) potable water service (City of Buffalo). Additionally, there is a ban on groundwater use as a public drinking water supply in the City of Buffalo and groundwater in the vicinity of the Site cannot be used as a source of potable water. Therefore, no human exposure via ingestion of contaminated groundwater is likely.

2.6 Qualitative Human Health Exposure Assessment

2.6.1 On-Site Assessment

The Site has been used for manufacturing purposes and is proposed to be redeveloped for residential and commercial use. Therefore, persons working at or visiting the Site could have been exposed to contamination present in the surface soil/fill. Under current Site use conditions (i.e., remediation and redevelopment), receptors to contaminated media (soil/fill and groundwater) would include construction workers involved in the remediation and/or redevelopment of the Site, and trespassers who may traverse the property during intrusive activities. Construction workers will be comprised of adults, and trespassers would likely be limited to adolescents and adults. In both instances, exposure frequency is expected to be minimal (short-term). The use of groundwater is prohibited for use as drinking water so there is no exposure through ingestion.

During remedial actions and future Site use, these potential exposures can be readily mitigated through the use of personal protective equipment (PPE); proper soil/fill management during intrusive activities; adherence to the approved health and safety plant (HASP) and CAMP; and implementation of institutional controls (environmental easement and restrict site use) and engineering controls (cover system).

2.6.2 Off-Site Assessment

PAHs have been detected at three (3) of the four (4) boundary samples collected during the RI above the RRSCOs (cleanup objective selected for the QCL site). It is reasonably inferred that contaminant concentrations detected on a property boundary, particularly those associated with fill material, exist at similar levels at nearby off-site locations, therefore, contaminants exceeding the Residential SCOs at the three (3) boundary sample locations (Boundary-SS1, SS-2 and SS-4, see Figure 3) are likely present off-site as well. At location Boundary-SS4 (west side of QCL Site), the adjacent off-site property is landlocked by the QCL site and Outer Harbor/Lake Erie, is owned by the QCL Site owner, and access is restricted (security fence along Fuhrmann Blvd) to Site workers. The two (2) locations along the east side of QCL Site (Boundary SS-1 and SS-2) are outside of the Site security fence but are both vegetated. Samples were collected below the vegetative cover in these areas.

Two (2) off-site surface soil/fill samples, SS-2 (0-2") North and SS-2 (0-2") South, and two (2) off-site subsurface soil/fill samples, SS-2 North (2"-12") and SS-2 South (2"-12") were collected and analyzed for SVOCs and metals. These samples were collected approximately 15 feet northeast and 15 feet southeast of Boundary-SS2 between the eastern property boundary and bike path along Fuhrmann Boulevard.

In the two (2) off-site surface soil/fill samples collected from 0 to 2-inches below grade, four (4) SVOCs were detected above their respective RSCOs of which only one (1) SVOC (benzo(a) pyrene) was detected slightly above its respective ISCO (see Table 2).

The results of the two (2) off-site subsurface soil/fill samples collected from 2-inch to 12-inch below grade were also consistent and indicative of uniform material. No SVOCs or metal analytes were detected above their respective USCOs in sample SS-2 North (2"-12"), but four (4) SVOCs were detected slightly above their respective RSCOs in both SS-2 (0-2") North and SS-2 (0-2") South.

Total SVOCs detected at the off-site sample locations were as follows.

SS-2 (0-2") North:	19.7 ppm
SS-2 North (2"-12"):	9 ppm
SS-2 (0-2") South:	19.4 ppm
SS-2 South (2"-12"):	12 ppm

PAHs are primarily emitted via anthropogenic activities, have the tendency to absorb onto soil particles, not known to readily leach, and are ubiquitous in urban areas and in urban fill. The results are consistent with the area and fill material that was used to construct the Site and surrounding area (Buffalo Outer Harbor).

2.7 Fish and Wildlife Impact Assessment

Review of information available via the NYSDEC Environmental Resource Mapper indicated that rare plants or animals were identified on the Site. The southern boundary of the Site also abuts against Lake Erie.

The Site is located approximately ¼-mile northwest of Tift Nature Preserve, a 264-acre nature refuge dedicated to conservation and environmental education. Both state and federal wetlands were identified at Tift Nature Preserve, but not on the subject property. In addition, the Site is not located in or substantially contiguous to a Critical Environmental Area designated pursuant to Article 8 or the ECL and 6 NYCRR 617. Moreover, historic use of the Site has rendered it of little ecological value. The property is substantially man made and devoid of vegetation that would provide cover for habitat and foraging.

Based on this information no adverse impacts to fish and wildlife resource impacts are expected.

3.0 REMEDIAL ALTERNATIVES ANALYSIS

This section provides an analysis of the selected remedial approach by media using the Remedy Selection Evaluation Criteria identified in Section 4.2 of Guidance Document DER-10: Technical Guidance for Site Investigation and Remediation (Ref. 6). In accordance with DER-10 Section 4.4(d)2, remedial alternatives for soil/fill will be developed and comparatively assessed for the Site against the following NYSDEC defined cleanup tracks:

- Track 1, 6NYCRR Part 375-3.8(e)(1) allows the site to be used for any purpose without restriction (i.e., residential, commercial, and/or industrial use) provided site media meets 6NYCRR Part 375 SCOs. The soil cleanup must achieve the unrestricted use criteria at any depth above bedrock.
- Track 2, 6NYCRR Part 375-3.8(e)(2) soil cleanups may consider the current, intended, or reasonably anticipated future use in determining the appropriate cleanup levels for soil. This track requires that the remedial party implement a cleanup that achieves the SCOs in the tables in 6NYCRR 375-6.7(b) for the top 15 feet of soil (or bedrock if less than 15 feet). Institutional and engineering controls are allowed for soil (for the top 15 feet of soil or bedrock if less than 15 feet) for less than five (5) years (defined as short-term controls). Institutional and engineering controls that limit site use and the use of on-site groundwater can be used without regard to duration. Track 2 cleanups at restricted-residential, commercial, or industrial use sites require Site Management Plans to ensure that material removed from the site (post-remedial action) is managed appropriately and to ensure that any buffer zone protecting adjacent residential use sites or ecological resources is maintained.
- Track 4, 6NYCRR Part 375-3.8(e)(4) soil cleanups use site-specific information to identify site-specific SCOs (or site-specific action levels (SSALs)) that are protective of public health and the environment under a restricted use scenario. For Track 4 remedies, restrictions can be placed on the use of the property in the form of institutional and engineering controls if they can be realistically implemented and maintained in a reliable and enforceable manner. For restricted-residential use, the top two (2) feet of exposed surface soil/fill that is not otherwise covered by the components of the development of the site (e.g. buildings, pavement) shall not exceed the RRSCOs. Areas that exceed the SCOs must be covered by material meeting the requirements of the generic soil cleanup table contained in 6NYCRR Part 375-6.7(d) or hardscape (building slab, asphalt pavement, etc.).

3.1 Standards, Criteria and Guidance

According to DER-10 Section 1.3(b)71, Standards, Criteria, and Guidance (SCGs) mean 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" mean the SCOs and supplemental SCOs identified in 6NYCRR 375-6.8 and the Commissioner Policy CP-51 on Soil Cleanup Guidance (Ref. 8).

Additional discussions concerning the specific chemical-, action-, and location-specific SCGs that may be applicable, relevant, or appropriate to remedy selection at 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 are inherently considered in the regulatory and guidance evaluations. Table 1 summarizes the SCGs by media that may be applicable or relevant and appropriate to the Site.

3.1.1 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; the reasonably anticipated future site use; and the likelihood that exposure to site contaminants will occur.

Soil/fill samples collected during the RI were compared to the Part 375 SCOs (see Tables 2, 3, and 4). Groundwater samples collected during the RI were compared to NYSDEC Class GA GWQSs/GVs (Table 5).

One of the remedial alternatives to be assessed for the Site is a Track 4 cleanup for soil/fill; therefore, a site-specific action level (SSAL) for arsenic was developed for the Site. Arsenic is a ubiquitous metal with urban background soils in New York State frequently containing concentrations in excess of the RRSCO (16 mg/kg). Therefore, an arsenic SSAL of 24 mg/kg is proposed for the Track 4 cleanup alternative.

According to NYSDEC CP-51 Soil Cleanup Guidance (Ref. 8), NYSDEC may approve a remedial program that achieves a soil cleanup level of 500 mg/kg for total PAHs for all subsurface soil in lieu of achieving all the PAH-specific SCOs in 6 NYCRR 375-6. Therefore, this CP-51 soil guidance level is proposed for the Track 4 cleanup.

The proposed cleanup objective for lead under the Track 4 approach is the CSCO (1,000 mg/kg). This goal, which is consistent with those employed on other Track 4 BCP sites having residential end uses, is proposed on the basis that the CSCOs assume routine contact by adults and children, and therefore do not pose an acute threat to adult or child residents who may inadvertently come into contact with subgrade soils if post-remedial excavation activities are undertaken on the restricted-residential area of the Site.

3.1.2 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 human health and the environment.

3.1.3 Action-Specific SCGs

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

3.2 Remedial Action Objectives

The development of an appropriate remedial approach begins with definition of site-specific Remedial Action Objectives (RAOs) to address substantial public health and

ecological risk or other significant environmental issues identified during remedial investigations. In developing the RAOs, consideration is given to the reasonably anticipated future use of the Site (i.e., restricted-residential use) and the applicable SCGs. Accordingly, appropriate RAOs for the Site have been defined as:

3.2.1 Soil/Fill RAOs

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil/fill causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

3.2.2 Groundwater RAOs

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of groundwater contamination.

3.3 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.

3.3.1 Soil/Fill

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

- Institutional controls (e.g., Site Management Plan, Environmental Easement)
- Engineering controls (e.g., cover system)
- Treatment (e.g., in situ or ex situ)
- Excavation and off-site disposal

3.3.2 Groundwater

The GRAs available to address the RAOs for groundwater include:

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

3.4 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. The estimates are a function of the cleanup goal for the reasonably anticipated future use scenario. The volume and extent of media requiring cleanup under the unrestricted use (Track 1) and restricted-residential (Track 4) use scenarios are presented in the following sections. In all instances, these volume estimates (and associated cost estimates) are projected based on the data and observations collected during the RI/additional investigation activities; additional volume may be discovered during post-excavation confirmatory sampling, which will subsequently affect these estimates.

3.4.1 Comparison to Unrestricted SCOs (Track 1 Cleanup)

Exceedances of the Part 375 unrestricted use SCOs (USCOs) were noted in the majority of soil/fill samples collected across the Site, primarily for PAHs and select metals (primarily arsenic, cadmium, chromium, copper, lead, manganese, mercury, and zinc); and, to a lesser extent, pesticides. Due to the highly ubiquitous nature of the constituents observed

in Site soil/fill and the extent to which they exceeded the USCOs, it is likely that the entire 7.72-acre BCP Site defines the impacted soil/fill area. Assuming the USCOs are exceeded to 15 fbgs, the volume of impacted soil/fill requiring remediation under a Track 1 cleanup is approximately 187,000 cubic yards (est. 300,000 tons at 1.6 tons/cubic yard). Figure 8 presents the locations where soil/fill analytical results exceed the USCOs across the Site.

3.4.2 Comparison to Restricted Use SCOs (Track 4 Cleanup)

A Track 4 cleanup for restricted-residential use would require a 2-foot thick soil cover, an impervious (hardscape) cover system, or a combination of both to be protective of human health for the typical property user (i.e., building occupants and visitors). However, NYSDEC has requested remedial action at a few locations prior to cover system placement. Based on the waste characterization samples collected to date soil/fill discussed herein for excavation and removal from the Site will be disposed of as non-hazardous soil/fill (see Figure 9). As discussed in Section 2.1.4.2, the USTs and petroleum impacted soil/fill formerly present in the northwestern portion of the Site in the vicinity of the former building slab was addressed in 2017 as an IRM and is considered complete.

Three (3) locations at the Site need to be addressed by remedial action which will involve excavation and off-site disposal at a landfill facility. These locations are: Boundary-SS2 (PAHs in surface soil/fill); disposal of the soil/fill stockpile (manganese and chromium impacts) generated from grading activities in the vicinity F4 and F6 along the northern property boundary; and petroleum-contamination identified in the vicinity of D7.

The PAHs identified at Boundary-SS2 (greater than 500 mg/kg) will require excavation and off-site disposal (see Figure 9). Due to the elevated PAHs, it cannot be placed under the cover system. Soil/fill in the vicinity of Boundary-SS2 (estimated to be less than 5 cubic yards) will be excavated and transported off-Site for proper disposal. A composite sample will be collected from the area to confirm the soil/fill remaining is acceptable to remain (PAHs less than 500 mg/kg).

The soil/fill stockpile (240-280 tons) present in the vicinity of F6 (see Figure 9), will be loaded into trucks and transported to the landfill, as outlined in the Additional Hotspot Work Plan. This work was not previously completed due to the extremely cold winter weather that occurred in late 2017/early 2018. After the soil/fill stockpile is removed, a

composite sample will be collected from in the vicinity of F6-SS and analyzed for chromium and manganese.

Additional test pits were completed in the vicinity of D7 to further assess the elevated PAHs detected from 10-11 feet, which had total PAH concentrations (935.7 mg/kg) above the proposed cleanup objective for total PAHs (500 mg/kg). Additional test pits completed in December 2017 identified an approximate 40 foot by 40 foot area that contained petroleum impacts from depths of approximately 5 to 6 feet below grade to 10 feet below grade that will require removal and proper disposal (see Figure 9). Confirmatory soil/fill samples will be collected and analyzed for VOCs and SVOCs to confirm the petroleum contamination has been removed.

Therefore, the proposed Track 4 cleanup activities would include addressing the three (3) areas identified above (Boundary-SS2, soil/fill stockpile in the vicinity of F6, and petroleum impacts at D7), institutional controls (e.g., groundwater and land use restrictions, Site Management Plan and Environmental Easement), and engineering controls (e.g., cover systems) as components of the final remedy to reduce future potential exposure to impacted soil/fill and groundwater.

3.4.3 Groundwater

The inorganic compounds detected in groundwater monitoring wells at concentrations above GWQS/GVs (see Figure 7) were limited to iron, magnesium, manganese, and sodium, which are naturally occurring minerals and considered ubiquitous groundwater constituents for this area. Three (3) PAHs were detected in groundwater at concentrations slightly above GWQS/GVs. The following five (5) VOCs were detected at concentrations above GWQS/GVs:

- Acetone was detected in well MW-9 during one sampling event. Acetone is a common laboratory contaminant and no known sources were located on-site. Therefore, the presence of acetone in the groundwater from MW-9 is likely a laboratory artifact rather than present in the groundwater itself.
- Benzene was detected in well MW-1; however, all soil/fill concentrations were well below the USCO.
- Dichlorofluoromethane (aka. Freon) was detected in well MW-9; however, it was not detected in any other media on-site.

- Methyl tert butyl ether (MTBE) was detected in well MW-7; however, all detections in soil/fill were well below the USCO.
- Naphthalene was detected in both groundwater and soil/fill (above the USCO but below the RRSCO) at MW-7. This location is downgradient of the former petroleum-impacted soil/fill area addressed by the IRM and the groundwater quality is anticipated to improve as a result.

As discussed in Section 2.2, there are five (5) sites present to the north, east and south of the QCL Site which have similar conditions (extensive fill material) and low-levels of VOCs, SVOCs, and metals in the soil/fill and groundwater. The low-level groundwater contamination at the Site (less than 70 ug/l for total VOCs and less than 30 ug/l for total SVOCs) do not warrant remedial action due to the extensive amount of fill present at the Site and in the Outer Harbor area. The metal analytes present in the groundwater (iron, magnesium, manganese, and sodium) are commonly found in urban areas, particularly in areas where significant fill material is present, and has been documented to be present at other sites surrounding the QCL Site.

Therefore, groundwater remediation has not been included in any remedial alternatives beyond placing a restriction on groundwater use which meets the Site RAO for groundwater by preventing ingestion of groundwater containing contaminant levels exceeding drinking water standards. In addition, potable groundwater use is prohibited in the City of Buffalo.

3.5 Evaluation of Alternatives

NYSDEC's Brownfield Cleanup Program calls for remedy evaluation in accordance with DER-10 Technical Guidance for Site Investigation and Remediation (Ref. 6). In addition to achieving RAOs, the remedial alternatives are evaluated against the following criteria consistent with 6NYCRR Part 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 as described in Section 3.1.
- **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, or volume of Site contamination. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the wastes at the Site.
- **Short-Term Impacts and Effectiveness**. Short-term effectiveness 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. The estimated soil/fill areas and volumes presented are estimates of the maximum in-place extent of impacted soil/fill. The cost estimates developed for the remedial alternatives include contingencies for excavation inefficiencies as well as volume to weight assumptions.

- **Community Acceptance**. This criterion evaluates the public's comments, concerns, and overall perception of the remedy. The Community Acceptance criterion incorporates public concerns into the evaluation of the remedial alternatives. Therefore, Community Acceptance of the remedy will be evaluated after the public review of the remedy selection process as part of the final NYSDEC remedy selection/approval.
- **Land Use**. In addition to the above criteria, 6NYCRR Part 375-1 specifies that the criterion of Land Use (i.e., the current, intended, and reasonably anticipated future land uses of the Site and its surroundings) be considered in the selection of the remedy. The reasonably anticipated future use of the Site, as initially submitted to the NYSDEC via the BCP application, is in a restricted-residential capacity. Appendix A includes the discussion of land use factors presented in the BCP Application.

3.5.1 Identification of Remedial Alternatives

The following remedial alternatives have been developed in accordance with the RAOs, GRAs, and NYSDEC regulation and policy:

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

3.5.1.1 Alternative 1: No Action

The no action alternative is defined as performing no remedial actions on the Site. In addition, no engineering or institutional controls would be put in place under this alternative.

Overall Protectiveness of Public Health and the Environment – This alternative would not protect public health and the environment due to the presence of contamination remaining on-site above SCGs, the absence of engineering controls to prevent exposure to the contamination and absence of institutional controls to prevent more restrictive forms of future site use (e.g., restricted residential) or the export of Site soil/fill to uncontrolled off-site locations. This alternative would not satisfy the RAOs for the Site.

Compliance with SCGs – Under the current and reasonably anticipated future use scenario (restricted residential), the contamination detected in the soil/fill and groundwater does not comply with SCGs per 6NYCRR Part 375.

Long-Term Effectiveness and Permanence – This alternative involves no remedial activities, equipment, engineering/institutional controls and provides no long-term maintenance measures and, as such, provides no reliable long-term control against exposure to impacted surface and subsurface soil/fill.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment – The no action alternative would not reduce the toxicity, mobility, or volume of contaminants in soil/fill, is not protective of public health and does not satisfy the RAOs.

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

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

Cost-Effectiveness – There are no capital or long-term operation, maintenance, and monitoring (OM&M) costs associated with the no action alternative.

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 AA Report. However, since this alternative is not protective of public health and the environment, the community would not likely accept the no action alternative for the Site.

Land Use – This alternative is not consistent with the reasonably anticipated future use of the Site in a restricted-residential capacity as it is not protective of public health and the environment.

3.5.1.2 Alternative 2: Unrestricted Use (Track 1) Cleanup

Alternative 2 consists of excavation and off-site disposal of all soil/fill that contains chemical constituents at concentrations greater than 6NYCRR Part 375 USCOs and/or has evidence of gross contamination. Achieving these Track 1 remediation goals (Section 4 and Part 4.4 (d)(2) of DER-10) obviates the need for engineering and institutional controls. For

unrestricted use scenarios, excavation and off-site disposal of impacted soil/fill is generally regarded as the most applicable remedial measure because engineering controls cannot be used to supplement the remedy.

As discussed in Section 3.4.1, the entire 7.72-acre BCP Site defines the impacted soil/ fill area. Based on TCLP testing during the RI and IRM, the excavated soil/fill would be suitable for disposal as non-hazardous at a commercial solid waste disposal facility. Excavated materials would require handling and preparation for off-site transportation and disposal. Since groundwater was observed at 5-7 fbgs, a dewatering system would be installed to facilitate excavation activities. Water generated during the dewatering activities would be treated on-site via temporary water treatment system and discharged to the sanitary sewer under a temporary discharge permit. Excavated areas would be backfilled with material meeting the BCP criteria presented in DER-10 and 6NYCRR Part 375 to the pre-excavation elevations and grades, and all disturbed areas would be restored with acceptable backfill, topsoil and grass seeding, or hardscape if redevelopment activities have been approved.

Based on the removal of all impacted soil/fill, the already low groundwater concentrations would be expected to decrease over time. A restriction on groundwater use would likely be included as a component of the remedial program per 6NYCRR Part 375-3.8(e)(1)(iii).

Overall Protectiveness of Public Health and the Environment – Excavation and off-site disposal to achieve USCOs would be protective of public health under any reuse scenario. However, this alternative would permanently use and displace approximately 187,000 cubic yards of valuable landfill airspace, causing ancillary environmental issues due to reduced landfill capacity, and would require excavating, transporting, and placing 187,000 cubic yards of clean soil from an off-site borrow source to backfill the excavation, also contributing to significant detrimental off-site environmental issues. The unrestricted use alternative would achieve the corresponding Part 375 SCOs, which are designed to be protective of public health under any reuse scenario.

Compliance with SCGs – Excavation and off-site disposal would need to be performed in accordance with applicable, relevant, and appropriate SCGs. Soil excavation

activities would necessitate preparation of and adherence to a health and safety plan (HASP) and community air monitoring plan (CAMP) in accordance with Appendices 1A and 1B of DER-10.

Long-Term Effectiveness and Permanence – This alternative would remove all impacted soil/fill and therefore provide long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment – Through removal of all impacted soil/fill, this alternative would permanently and 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 would increase. Site workers would be at greater risk of injury due to 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 13,360 truckloads (at 14 cubic yards per truckload) 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 116,900 gallons (assuming 70 miles round trip to a local 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 2.6 million pounds of greenhouse gas.

This alternative represents a significant adverse effect in the short-term; however, the RAOs would be achieved once the soil/fill is removed from the Site and backfill soils are in place (est. 6 months).

Implementability – Significant technical and administrative implementability issues would be encountered in construction of this unrestricted use alternative. 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/ or discharge/disposal; and traffic coordination for trucks entering and exiting the Site. In addition, construction of buildings following deep excavation of native material will result in geotechnical and safety issues relating to structural integrity of building foundations. 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-Effectiveness – The remedial costs for implementation of Alternative 2 are estimated at $25.4 million. Table 6 provides a breakdown of these remedial 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.

However, since this alternative is protective of public health and the environment, the community would likely accept the unrestricted use alternative; although significant short-term disruption may result in complaints by neighbors.

Land Use – This alternative is consistent with the reasonably anticipated future use of the Site.

3.5.1.3 Alternative 3: Restricted Use (Track 4) Cleanup

A Track 4 restricted-residential cleanup approach would consist of removing the impacted soil/fill at the three (3) locations described in Section 3.4.2 followed by off-site

disposal and Site-wide cover system placement. As such, Alternative 3 would include the components listed below and shown on Figure 9:

- Removal of the PAH-impacted soil/fill present at Boundary-SS2 (less than 5 cubic yards), soil/fill stockpile present in the vicinity of F6 (240-280 tons) and the petroleum-impacted soil/fill present in the vicinity of D7 (300 cubic yards). The impacted soil/fill will be disposed off-site at a commercial sanitary landfill. Samples will be collected from these removal activities to confirm the remedial actions have meet the remedial objectives.
- Backfilling of the excavation with material that will meet the requirements of 6NYCRR Part 375-6.7(d) or otherwise NYSDEC-approved material (e.g., crushed concrete greater than ⅛-inch from processing of the former on-site building).
- In order to meet the final grades of the redevelopment plan, the Site grades will need to be raised across the majority of the Site. Existing grades in the central portion of the Site are about elevation 576 to 577 ft (assumed datum of NAVD88). A conceptual grading plan is included as Figure 11 for the soil cover system.

  The Site grades will be raised using existing on-site processed concrete (greater than ⅛-inch in size) and/or soil/fill material meeting the requirements of 6NYCRR Part 375-6.7(d) that will be imported. The cover system will be DER-10 compliant and consist of a 2-foot soil/fill cover system across most of the Site and a concrete walking path and sidewall stabilizing retaining wall (to stabilize fill remaining at depth and protect from erosion and/or sidewall collapse) along the southern portion. A demarcation layer (e.g., orange plastic netting) will be installed beneath the cover system that will be installed to meet the existing Site grades along the northern and eastern boundaries of the Site. The existing soil/fill in the northern and eastern areas will be excavated along the perimeter of the Site to create space for 2-feet of a compliant soil cover. The excavated material will be disposed off-site at a commercial sanitary landfill or used as on-site backfill underneath the 2-foot soil/fill with NYSDEC approval.
- Implementation of a Site Management Plan (SMP). For any BCP Site not remediated to meet NYSDEC Part 375 USCOs, preparation of an SMP that describes site-specific Institutional Controls and/or Engineering Controls (IC/EC) is a required component of the final remedy. The SMP will include the following components: IC/EC Plan; Operations and Maintenance (O&M) Plan; Excavation Work Plan; Site Monitoring Plan; and Environmental Easement.

Overall Protectiveness of Public Health and the Environment – This alternative meets 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 remedial activities to remove impacted soil/fill from the three (3) areas identified installation of a DER-10 compliant cover system across the Site (soil cover across most of the Site with a concrete walking path and retaining wall (to stabilize fill remaining at depth and protect from erosion and/or sidewall collapse) along the southern portion (see Figure 11)); and the use of IC/ECs to prevent potential future exposure and limit the future Site use to restricted-residential.

Compliance with SCGs – The remedial activities would be performed in accordance with applicable, relevant, and appropriate SCGs (see Table 1). Imported cover material would need to meet backfill quality criteria per DER-10 and 6NYCRR Part 375-6.7(d). Vegetative cover stripping, excavation, and cover placement will be performed under the BCP in accordance with a SWPPP and SPDES General Permit prepared in support of the overall Site redevelopment plan. Subgrade preparation activities would also adhere to a CAMP in accordance with Appendices 1A and 1B of DER-10. The planned remedial actions are fully protective of public health and the environment, and achieve all RAOs for the Site.

Long-Term Effectiveness and Permanence – Removal of the impacted soil/fill areas as well as construction of a cover system will prevent direct contact with soil/fill exceeding the RRSCOs. Periodic inspection and maintenance of the soil cover will be required to assure long-term cover integrity. The SMP will include an O&M Plan to confirm that engineering controls, including the cover systems, are operating and being maintained in accordance with the SMP; an Excavation Work Plan to address any impacted soil/fill encountered during post-development 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 Erie County, which will limit the future use of the Site to restricted-residential use, 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 – Removal of impacted soil/fill areas followed by placement of cover systems will permanently and significantly reduce the toxicity, mobility, and volume of the soil/fill

that could potentially be contacted or produce localized areas of environmental impact at the Site. Accordingly, this alternative satisfies this criterion.

Short-Term Effectiveness and Impacts – During impacted soil/fill excavations, 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 personal protection equipment; environmental monitoring; establishment of work zones and Site control; and appropriate decontamination procedures. Excavation of the impacted soil/fill areas would be completed within a few weeks thereby limiting short-term adverse effects. Remedial activities will be performed in accordance with an approved Remedial Action Work Plan, including Health and Safety Plan (HASP), CAMP, and soil erosion measures. All of the above-mentioned controls will be in place during cover system placement. This alternative achieves the RAOs for the Site.

Implementability – No significant technical or administrative implementability issues are associated with this alternative.

Cost-Effectiveness – The estimated capital cost for Alternative 3 is $2.65 million. This includes excavation and off-site disposal of impacted soil/fill areas; backfilling; construction of cover systems; and development of an FER and SMP. Annual OM&M costs for cover maintenance and annual certifications are estimated at $8,000. Therefore, the 30-year present worth of the remedial cost to implement Alternative 3 is estimated at $2.81 million. Table 7 provides a breakdown of these remedial costs.

Land Use – Based on the land use evaluation included as Appendix A, reuse of the Site in a restricted-residential capacity is consistent with proposed development and zoning on-site and within the vicinity of the Site, and does not pose additional environmental or public health risks.

Community Acceptance – 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.

3.5.2 Comparison of Remedial Alternatives

The previous sections describe and evaluate the remedial alternatives for the Site against the screening criteria. Table 8 provides a comparison of the alternatives to identify appropriate remedial measures that will achieve the RAOs for the Site.

3.5.3 Preferred Remedial Alternative

The proposed remedial approach for the Site is *Alternative 3; Restricted Residential Use (Track 4) Cleanup* because it is fully protective of public health and the environment; is significantly less disruptive to the community; is consistent with future land use; and represents a more cost-effective approach than Alternative 2 while fully satisfying the RAOs for the Site. Alternative 3 would constitute the final remedy for the Site.

In summary, Alternative 3 would involve:

- Excavating and disposing off-site the impacted soil/fill identified in the three (3) areas above the remedial action objectives.
- Performing post-excavation sampling of the excavation areas to confirm impacts have been removed.
- Site grades will need to be raised across the majority of the Site. The Site grades will be raised using existing on-site processed concrete (greater than ⅛-inch in size) and soil/fill material meeting the requirements of 6NYCRR Part 357-6.7(d) will be imported. The cover system will be DER-10 compliant consisting of a 2-foot soil/fill cover system across most of the Site and a concrete walking path and retaining wall (to stabilize fill remaining at depth and protect from erosion and/or sidewall collapse) along the southern portion (see Figure 11). A demarcation layer (e.g., orange plastic netting) will be installed beneath the cover system that will be installed to meet the existing Site grades along the northern and eastern boundaries of the Site. The existing soil/fill in the northern and eastern areas will be excavated along the perimeter of the Site to create space for 2 feet of a compliant soil/fill cover. The excavated material will be disposed off-site at a commercial sanitary landfill or used as on-site backfill underneath the 2-foot soil/fill cover system with NYSDEC approval. The proposed site plan is provided in Figure 10.
- Implementing an SMP that will include:
    - Institutional Controls and Engineering Controls (IC/EC) Plan. Engineering controls include any physical barrier or method employed to actively or passively contain, stabilize, or monitor contaminants; restrict

the movement of contaminants; or eliminate potential exposure pathways to contaminants. Institutional controls at the Site will include restrictions on groundwater use and Site use to restricted-residential.

- Excavation Work Plan to assure that future intrusive activities and soil/fill handling at the Site are completed in a safe and environmentally responsible manner.
- Site Monitoring Plan that includes provisions for a Site-wide inspection program to assure that the IC/ECs have not been altered and remain effective.
- Environmental Easement filed with Erie County.

The remedial measures will be described in a Remedial Action Work Plan (RAWP) and submitted to NYSDEC for approval. The completed remedial activities will be documented in a Final Engineering Report.

4.0 POST-REMEDIAL REQUIREMENTS

4.1 Final Engineering Report

Following completion of the remedial measures, a Final Engineering Report (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.

4.2 Site Management Plan

A Site Management Plan (SMP) covering the entire Site will be prepared and submitted concurrent with the FER. The purpose of the SMP is to assure 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:

- Engineering and Institutional Control Plan
- Site Monitoring Plan
- Operation and Maintenance Plan
- Inspections, Reporting, and Certifications

4.2.1 Engineering and Institutional Control Plan

An institutional control in the form of a new Environmental Easement will be necessary to limit future use of the Site to restricted-residential applications and prevent groundwater use for potable purposes.

The Engineering and Institutional Control (EC/IC) 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 EC/IC Plan will include:

- A description of all EC/ICs on the site.
- The basic implementation and intended role of each EC/IC.
- 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 EC/IC certification, reporting, and Site monitoring.
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

4.2.2 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 need for and frequency of post-remedial groundwater monitoring (if required) as well as types of analyses to assess overall reduction in contamination on-site and off-site will also be included in the Site Monitoring Plan.

4.2.3 Operation and Maintenance Plan

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

- Include the operation and maintenance activities necessary to allow individuals unfamiliar with the Site to maintain the cover system.
- 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 the manner in which the cover system is maintained.

4.2.4 Inspections, Reporting and Certifications

4.2.4.1 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).

4.2.4.2 Reporting

The PRR will be submitted to the NYSDEC annually, or as otherwise approved, beginning 18 months after the Certificate of Completion or equivalent document 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 EC/ICs 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, ROD, 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.

4.2.4.3 Certifications

The signed EC/IC Certification will be included in the PRR described in Section 4.2.4.2. For each EC/IC identified for the Site, a Professional Engineer licensed to practice in New York State will certify that all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the EC/ICs required by the remedial program was performed under my direction.
- The EC/ICs 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.

4.2.4.4 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.

5.0 REFERENCES

1. C&S Engineers, Inc. *Remedial Investigation, Alternatives Analysis Report, and Remedial Work Plan Report, Queen City Landing, 1005 Fuhrmann Blvd (SBL: 132.06-1-1.2) and a Portion of 975 Fuhrmann Blvd (SBL: 132.06-1-1.1), City of Buffalo, Erie County, New York, Site No. C915304*. April 2017.

2. C&S Engineers, Inc. *Remedial Investigation/Interim Remedial Measures/Alternatives Analysis Work Plan, Queen City Landing, 1005 Fuhrmann Blvd (SBL: 132.06-1-1.2) and a Portion of 975 Fuhrmann Blvd (SBL: 132.06-1-1.1), City of Buffalo, Erie County, New York, Site No. C915304*. December 2016.

3. Benchmark Environmental Engineering and Science, PLLC. *Interim Remedial Measure Report, Petroleum Contamination Cleanup, Queen City Landing Site BCP Site No. C915304, 975 and 1005 Fuhrmann Boulevard, Buffalo, New York.* January 25, 2018.

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8. New York State Department of Environmental Conservation. *Policy CP-51; Soil Cleanup Guidance*. October 21, 2010.

9. Dvirka and Bartilucci Consulting Engineers. *Phase I/Phase II Remedial Investigation Report, Buffalo Outer Harbor Site, City of Buffalo, Erie County, New York (Site Registry No. 9-15-026)*. December 1995.

10. EA Engineering, Science and Technology, Inc. *Engineering Investigations at Inactive Hazardous Waste Sites, Phase II Investigation, Tift Farms, Site No. 915072, City of Buffalo, Erie County*. April 1988.

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12. LiRo Engineers, Inc. *Phase II Environmental Site Investigation for 225 Fuhrmann Boulevard.* September 15, 2008.

13. Watts Engineers. *Phase II Field Investigation and Site Assessment Report for Gallagher Beach, Buffalo, New York.* August 2004.

14. Ecology and Environment Engineering, P.C. *Draft Sanitary Survey for the Buffalo Harbor State Park – Gallagher Beach, Erie County, Buffalo, New York.* May 2015.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

STANDARDS, CRITERIA, AND GUIDANCE

Alternatives Analysis Report
Queen City Landing Site
Buffalo, New York

Citation	Title	Regulatory Agency
General		
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response	US Dept. of Labor, OSHA
29 CFR 1910.1000	OSHA General Industry Air Contaminants Standard	US Dept. of Labor, OSHA
29 CFR 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
Section 404	Clean Water Act	USACE
Soil		
6NYCRR Part 375	Environmental Remediation Programs	NYSDEC
DEC Policy CP-51	Soil Cleanup Guidance	NYSDEC
Groundwater		
6NYCRR Part 700-706	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
NYSDOH, October 2006	Final - Guidance for Evaluating Soil Vapor Intrusion in the State of New York	NYSDOH
Solid Waste		
6NYCRR 360	Solid Waste Management Facilities	NYSDEC
6NYCRR 364	Waste Transporters	NYSDEC

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2

SUMMARY OF REMEDIAL INVESTIGATION SURFACE SOIL/FILL SAMPLE ANALYSIS RESULTS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	A7-SS	Q	DUP-A-010617	Q	A8-SS	Q	A9-SS	Q	C1-SS	Q	D1-SS	Q	F1-SS	Q	F2-SS	Q	F3-SS	Q	F4-SS	Q	F5-SS	Q	F6-SS	Q	Boundary-SS1	Q	Boundary-SS2	Q	OFF-SITE SS-2 (0-2") NORTH	Q	OFF-SITE SS-2 NORTH (2-12")	Q	OFF-SITE SS-2 (0-2") SOUTH	Q	OFF-SITE SS-2 SOUTH (2-12")	Q	Boundary-SS3	Q	Boundary-SS4	Q
					1/6/2017		1/6/2017		1/20/2017		1/26/2017		1/20/2017		1/25/2017		1/6/2017		1/6/2017		1/25/2017		1/25/2017		1/26/2017		11/7/2016		1/6/2017		1/26/2017		12/12/2017		12/12/2017		12/12/2017		12/12/2017		1/26/2017		1/26/2017	
Volatile Organic Compounds (VOCs) - mg/Kg [4]																																											
Acetone	**0.05**	**100**	**500**	**1000**	ND	R	ND	R	ND	R	ND	R	ND	R	**0.614**	J	ND	R	ND	R	ND		ND		~~0.199~~	R	ND	R	ND	R	ND	R	NT		NT		NT		NT		ND	R	ND	R
Carbon disulfide	--	--	--	--	ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND		ND		~~0.0152~~	R	ND	R	ND	R	ND	R	NT		NT		NT		NT		ND	R	ND	R
Methylene chloride	**0.05**	**100**	**500**	**1000**	ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R	NT		NT		NT		NT		ND	R	~~0.0139~~	R
Naphthalene	**12**	**100**	**500**	**1000**	~~0.0912~~	R	~~0.0117~~	R	~~0.00782~~	R	ND	R	ND	R	0.662		ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R	NT		NT		NT		NT		ND	R	~~0.00774~~	R
Trichlorofluoromethane (Freon-11)	--	--	--	--	~~0.0787~~	R	~~0.0186~~	R	ND	R	ND	R	ND	R	0.395	J	ND	R	ND	R	0.0207	J	0.00739	J	~~0.0302~~	R	ND	R	ND	R	ND	R	NT		NT		NT		NT		ND	R	~~0.0744~~	R
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg [4]																																											
Acenaphthene	**20**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		0.675		ND		ND		ND		ND		ND		ND		ND		ND		0.079	J	0.067	J	0.072	J	0.059	J	ND		0.805	
Acenaphthylene	**100**	**100**	**500**	**1000**	ND		ND		ND		ND		0.324	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		0.085	J	0.044	J	0.099	J	0.31		ND		ND	
Anthracene	**100**	**100**	**500**	**1000**	4.6	J	5.19	J	0.179	J	ND		0.975		1.55 J		ND		ND		ND		ND		0.369		ND		0.53		7.3	J	0.21		0.42		0.27		0.34		ND		1.83	
Benzo(a)anthracene	**1**	**1**	**5.6**	**11**	**31**		**20.8**		0.693		0.283	J	**2.48**		**2.69**		0.569		ND		**2.06**		**1.11**		**3.48**		**2.09**		**33.3**		**1.2**		0.68		**1.2**		0.8		0.575		**3.58**	
Benzo(a)pyrene	**1**	**1**	**1**	**1.1**	**35.5**		**33.6**		0.648		0.227	J	**2.31**		**1.84**		0.562		ND		**2.58**		0.915		**5.01**		**2.05**		**37.2**		**1.5**		0.055		**1.7**		1		0.576		**2.48**	
Benzo(b)fluoranthene	**1**	**1**	**5.6**	**11**	**38.1**		**37.4**		0.67		0.253	J	**2.32**		**1.74**		0.556		ND		**3.13**		0.947		**6.26**		**2.34**		**52.3**		**2.7**		0.8		**2.8**		**1.6**		0.599		**2.57**	
Benzo(ghi)perylene	**100**	**100**	**500**	**1000**	29.4		28.2		0.428		0.166	J	1.35		1.1		0.405		ND		0.203	J	3.05		0.618		4.65		1.49		36.8		1.4		0.31		1.3		0.88		0.444		1.55	
Benzo(k)fluoranthene	**0.8**	**3.9**	**56**	**110**	**31.4**		**26.9**		0.559		0.182	J	**1.69**		**1.35**		0.434		ND		**1.96**		0.602		**4.55**		**1.43**		**32.3**		**0.86**		0.27		**0.83**		0.49		0.394		**1.85**	
Bis(2-ethylhexyl) phthalate	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		6.75		ND		NT		NT		NT		NT		ND		ND	
Butyl benzyl phthalate	--	--	--	--	ND		ND		ND		ND		ND		11.9		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Carbazole	--	--	--	--	ND		ND		ND		ND		0.648		0.771		ND		ND		ND		ND		ND		ND		0.381		12.3		NT		NT		NT		NT		ND		0.895	
Chrysene	**1**	**3.9**	**56**	**110**	**42.7**		**40.2**		0.815		0.281	J	**2.92**		**2.09**		0.616		ND		**2.57**		0.984		**5.59**		**2.36**		**51**		**1.9**		0.61		**1.7**		0.91		0.64		**2.96**	
Dibenz(a,h)anthracene	**0.33**	**0.33**	**0.56**	**1.1**	**10.8**		**10.3**		ND		ND		**0.518**	J	**0.363**	J	0.183	J	ND		ND		0.164	J	**1.66**		ND		**0.623**		**8.72**	J	0.3		0.1	J	0.3		0.2		**0.451**	J	0.451	J
Dibenzofuran	**7**	**59**	**350**	**1000**	ND		ND		ND		ND		0.335	J	0.538	J	ND		ND		ND		ND		ND		ND		ND		ND		0.05	J	0.11	J	0.048	J	0.053	J	ND		0.649	J
Fluoranthene	**100**	**100**	**500**	**1000**	84.4		81.2		1.46		0.705		7.37		6.08		1.09		ND		0.288	J	4.38		2.35		9.49		4.88		**117**		3.6		1.5		3.4		1.9		1.24		8.02	
Fluorene	**30**	**100**	**500**	**1000**	ND		ND		ND		ND		0.559	J	0.779		ND		ND		ND		ND		ND		ND		0.183	J	ND		0.091	J	0.18	J	0.079	J	0.094	J	ND		0.958	
Indeno(1,2,3-cd)pyrene	**0.5**	**0.5**	**5.6**	**11**	**19.8**		**19.7**		0.332	J	0.177	J	**1.08**		**1.31**		0.28	J	ND		**2.88**		**0.755**		**3.01**		**1.12**		**41**		**1.4**		0.37		**1.5**		0.89		0.455		**1.78**	
Naphthalene	**12**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		0.662		ND		ND		ND		ND		ND		ND		ND		ND		0.029	J	ND		0.044	J	0.06	J	ND		0.464	J
Phenanthrene	**100**	**100**	**500**	**1000**	32.1		33.9		0.87		0.544		7.42		5.77		0.52		ND		0.191	J	1.39	J	1.42		3.9		2.63		61.5		1.6		1.5	J	1.5		0.88		0.673		6.81	
Pyrene	**100**	**100**	**500**	**1000**	62.8		60.6		1.1		0.483		5.63		3.79		0.861		ND		0.212	J	3.29		1.64		8.39		3.54		81.4		2.7		1		2.6		1.4		1.02		5.23	
Total Metals - mg/Kg																																											
Arsenic	**13**	**16**	**16**	**16**	8.37		8.66		11.9		3.1		7.39		6.76		3.63		1.25		1.48		3.87		5.65		6.18		6.07		4.17		5.89		8.02		9.04		6.64		3.37		8.39	
Barium	**350**	**400**	**400**	**10000**	96.6		84.2		85		11.8		58.1		81.1	J	72.5		132		146	J	88.5	J	110		41.8		55.7		42.9		45.9		41.8		56.1		47		44.6		82.5	
Beryllium	**7.2**	**72**	**590**	**2700**	0.846		0.796		0.633		0.141	J	0.949		0.711		0.637		3.42		3.95		2.38		2.68		0.514		0.393		0.426		0.43		0.383		0.454		0.425		0.379		1.04	
Cadmium	**2.5**	**4.3**	**9.3**	**60**	**3.63**	J	1.08	J	0.793		0.502	M	0.221	J	1.12		1.27		2		1.29		0.891		1.11		**2.58**		0.886		0.766		0.382	J	0.393	J	0.422	J	0.393	J	0.916		1.6	
Hex Chromium	**1**	**110**	**400**	**800**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Chromium	**30**	**180**	**1500**	**6800**	24.7		27.9		17		4.66	D	4.31		14.3		**40.1**		9.86		7.17		8.29		10.4		**712**		12.1		17.9		12		11		13.3		10.7		13.5		10.9	
Copper	**50**	**270**	**270**	**10000**	48.3		36		25.5		4.48		23.4		22.2	J	36.1		21.2		12.4	J	10.7	J	13		**101**		19.5		20.3		19.4		18.1	J	20.7		16.5		19.6		30.8	
Cyanide	**27**	**27**	**27**	**10000**	ND		0.664		ND		ND		ND		0.435		ND		2.79		2.61		1.67		4.28		0.418		ND		1.79		ND		ND		ND		ND		ND		0.942	
Lead	**63**	**400**	**1000**	**3900**	**111**		**114**		**72.7**		28.6	M	39.3		59.7		**76.2**		23.5		11.1		23.6		37		**96.2**		**81.2**		44.9		26.9		26		29.6		27.6		**73.4**		**89.1**	
Manganese	**1600**	**2000**	**10000**	**10000**	562		508		447		624		344		442		1380		**2460**		**2360**		1150		1370		**11600**		289		472		318		326	J	357		396		411		558	
Mercury	**0.18**	**0.81**	**2.8**	**5.7**	**0.34**		**0.258**		0.113		0.0159		0.128		~~0.127~~	R	**0.64**		ND		~~0.0983~~	R	0.137		0.0994		0.0193		0.09	J	0.09	J	0.08	J	**0.229**		0.0303	
Nickel	**30**	**310**	**310**	**10000**	15		15.5		15.6		3.64	M	5.9		10.6		12		5.39		3.1		3.91		6.58		18.7		11.3		9.64		12.7		12.2	J-	13.8		12.4		8.9		10.1	
Selenium	**3.9**	**180**	**1500**	**6800**	2.42		3.46		1.09		2.49		2.17		**4.02**		2.09		2.77		2.94		1.51		4.17		0.714		1.53		**4.34**		0.335	J	0.317	J	0.406	J	0.457	J	1.52		**4.4**	
Silver	**2**	**180**	**1500**	**6800**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		**2.53**		ND		ND		ND		ND		ND		0.131	J	ND		**ND**	
Zinc	**109**	**10000**	**10000**	**10000**	**375**		**315**		**123**		68.2	DM	87.6		~~150~~	R	**153**		94.8		~~52.4~~	R	~~67~~	R	109		**214**		**165**		99.4		80.4		65.1	J	76.4		64.7		100		**148**	
Polychlorinated biphenyls (PCBs) - mg/Kg [4]																																											
Aroclor 1254	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.0307	J	ND		ND		ND		NT		NT		NT		NT		ND		ND	
Total PCBs	**0.1**	**1**	**1**	**25**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.0307	J	ND		ND		ND		NT		NT		NT		NT		ND		ND	
Pesticides and Herbicides - mg/Kg [4]																																											
4,4'-DDE	**0.0033**	**8.9**	**62**	**120**	ND		ND		ND		0.00202	NJ	ND		**0.00522**	JN	ND		ND		ND		ND		ND		ND		**0.0144**	NJ	ND		ND		NT		NT		NT		NT		ND		ND	
4,4'-DDT	**0.0033**	**7.9**	**47**	**94**	ND		ND		ND		ND		**0.0278**	J	**0.00474**	JN	ND		0.00222	NJ	**0.00417**	J	ND		ND		**0.00761**	NJ+	**0.0074**		ND		ND		NT		NT		NT		NT		**0.00703**	J+	**0.0318**	J+
4,4-DDD	**0.0033**	**13**	**92**	**180**	ND		ND		ND		ND		**ND**		ND		ND		0.00198	J	ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Aldrin	**0.005**	**0.097**	**0.68**	**1.4**	ND		ND		ND		ND		ND		**0.0111**	JN	ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
alpha-BHC	**0.02**	**0.48**	**3.4**	**6.8**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
beta-BHC	**0.036**	**0.36**	**3**	**14**	ND		ND		ND		ND		ND		ND		ND		ND		ND		0.00481	NJ	ND		0.0239	J+	ND		ND		ND		NT		NT		NT		NT		ND		ND	
cis-Chlordane	**0.094**	**4.2**	**24**	**47**	**0.207**		**0.173**		0.00367	J	0.00193	J	ND		ND		ND		ND		ND		ND		ND		0.0683	J+	ND		ND		NT		NT		NT		NT		NT		ND		0.0251	NJ
delta-BHC	**0.04**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Dieldrin	**0.005**	**0.2**	**1.4**	**2.8**	ND		ND		ND		ND		ND		0.00254	J	ND		ND		ND		ND		ND		**0.0157**	J+	ND		ND		NT		NT		NT		NT		NT		0.0046	NJ	**0.00688**	NJ
Endosulfan I	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		0.00897	NJ	ND		ND		ND		ND		ND		0.00525	J+	ND		ND		NT		NT		NT		NT		NT		ND		ND	
Endosulfan II	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Endosulfan sulfate	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		0.00848	J	ND		0.00358	NJ	ND		0.00728	J	ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Endrin	**0.014**	**11**	**89**	**410**	ND		ND		ND		ND		ND		0.00531	NJ	ND		0.00178	J	ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Endrin aldehyde	--	--	--	--	0.0406	J	ND		ND		ND		ND		0.00218	J	ND		ND		ND		ND		ND		ND		ND		0.0262	J	NT		NT		NT		NT		NT		0.0019	J+	ND	
Endrine ketone	--	--	--	--	ND		ND		ND		ND		ND		0.00831	J	ND		0.00233	J	ND		ND		ND		0.0158	J+	ND		ND		NT		NT		NT		NT		NT		0.0123	J+	0.0144	J+
gamma-BHC (Lindane)	**0.1**	**1.3**	**9.2**	**23**	ND		ND		ND		ND		ND		ND		ND		0.00418	J	ND		0.00749		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Heptachlor	**0.042**	**2.1**	**15**	**29**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Heptachlor epoxide	--	--	--	--	0.0261	NJ	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
Methoxychlor	--	--	--	--	ND		ND		ND		0.00509	NJ	ND		0.0624	J	ND		ND		0.00427	J	0.0195	NJ	ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	
trans-Chlordane	--	--	--	--	ND		N		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		NT		NT		ND		ND	

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
3. Values per NYSDEC Part 375 Table 375-6.8(b) Restricted Soil Cleanup Objectives.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:

ND = Parameter not detected above laboratory detection limit.
NT = Parameter was not analyzed for.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low.
NJ = The detection is tenative in identification and estimated in value.
R = The sample results are rejected due to deficiencies in meeting Quality Control limits. Tha analyte may or may not be present.

Bold	= Result exceeds Unrestricted Use SCOs.
Bold	= Result exceeds Restricted Residential Use SCOs.
Bold	= Result exceeds Commercial Use SCOs.
Bold	= Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF REMEDIAL INVESTIGATION SUBSURFACE SOIL/FILL SAMPLE ANALYSIS RESULTS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	MW1-4-8ft	Q	MW1-10-12ft	Q	MW1-15-16ft	Q	MW2-2-4ft	Q	MW2-5-8ft	Q	MW2-15-18ft	Q	MW3-5-7ft	Q	MW3-12-14ft	Q	MW3-14-16ft	Q	MW4-2-5ft	Q	MW4-8.5-10ft	Q	MW4-15ft	Q	MW5-4-6ft	Q	MW5-9-12ft	Q
					Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Native		Urban Fill		Urban Fill		Native		Urban Fill		Construction Fill	
Volatile Organic Compounds (VOCs) - mg/Kg [4]																																
1,2-Dichlorobenzene	1.1	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
1,2,4-Trimethylbenzene	3.6	52	190	380	ND		ND		ND		0.00237		ND		ND		0.00104	J	ND		ND		ND		ND		ND		ND		ND	
1,3,5-Trimethylbenzene	8.4	52	190	380	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
2-Butanone (MEK)	0.12	100	500	1000	ND		ND		ND		ND		0.00658	J	ND		ND		ND		ND		ND		ND		ND		ND		ND	
Acetone	0.05	100	500	1000	ND		0.0154		0.00941		0.0169		0.0206		0.00611	J	0.0061	J	ND		0.00734	J	0.00974	J	ND		0.0236		ND		0.00674	J
Benzene	0.06	4.8	44	89	ND		ND		0.00358		ND		ND		ND		0.00262		ND		ND		ND		ND		ND		ND		ND	
Carbon disulfide	--	--	--	--	ND		ND		0.00462		0.00193	J	0.00108	J	ND		0.00133	J	ND		ND		0.00119	J	ND		ND		ND		ND	
Chlorobenzene	1.1	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
cis-1,2-Dichloroethylene	0.25	100	500	1000	ND		ND		ND		ND		ND		0.0032		ND		ND		ND		ND		ND		ND		ND		ND	
Cyclohexane	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Ethylbenzene	1	41	390	780	ND		ND		ND		ND		ND		ND		0.00102	J	ND		ND		ND		ND		ND		ND		ND	
Isopropylbenzene (Cumene)	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Total Xylenes	0.26	100	500	1000	ND		ND		ND		0.00179	J	ND		ND		0.00209		ND		ND		ND		ND		ND		ND		ND	
Methyl acetate	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Methylcyclohexane	--	--	--	--	ND		ND		ND		ND		ND		ND		0.002		ND		ND		ND		ND		ND		ND		ND	
Methylene chloride	0.05	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Naphthalene	12	100	500	1000	0.00489		0.0062		0.0426		0.0076		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.00504	
n-Butylbenzene	12	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
n-Propylbenzene	3.9	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
p-Cymene (p-isopropyltoluene)	--	--	--	--	ND		0.00154	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
sec-Butylbenzene	11	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Styrene	--	--	--	--	ND		ND		ND		ND		ND		ND		0.0105		ND		ND		ND		ND		ND		ND		ND	
tert Butyl Methyl Ether	0.93	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Toluene	0.7	100	500	1000	ND		ND		ND		ND		ND		ND		0.00189		ND		ND		ND		ND		ND		ND		ND	
Trichloroethene	0.47	21	200	400	ND		ND		ND		ND		ND		0.000992	J	ND		ND		ND		ND		ND		ND		ND		ND	
Vinyl chloride	0.02	0.9	13	27	ND		ND		ND		ND		ND		0.00137	J	ND		ND		ND		ND		ND		ND		ND		ND	
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg [4]																																
1,1-Biphenyl	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
2-Methylnaphthalene	--	--	--	--	ND		ND		0.196	J	ND		ND		ND		0.259	J	ND		ND		ND		ND		ND		ND		ND	
Acenaphthene	20	100	500	1000	ND		0.312	J	0.21	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.198	J
Acenaphthylene	100	100	500	1000	ND		0.278	J	ND		ND		0.29	J	ND		ND		ND		ND		ND		ND		ND		ND		ND	
Anthracene	100	100	500	1000	0.397		1.24		0.429		ND		0.606		ND		ND		ND		ND		ND		0.469		0.24	J	ND		0.902	
Benzo(a)anthracene	1	1	5.6	11	0.815		**2.6**		**1.11**		0.973	J	**1.52**		ND		0.576		ND		0.35	J	0.25	J	**1.15**		0.354		ND		**1.38**	
Benzo(a)pyrene	1	1	1	1.1	0.609		**2.19**		0.969		0.848	J	**1.39**		ND		0.454		ND		0.282	J	0.249	J	**1.01**		0.246	J	ND		**1.09**	
Benzo(b)fluoranthene	1	1	5.6	11	0.558		**2.68**		**1.21**		0.891	J	**1.5**		ND		0.494		ND		0.233	J	0.28	J	**1.24**		0.193	J	ND		**1.06**	
Benzo(ghi)perylene	100	100	500	1000	0.329		1.44		0.627		ND		0.887		ND		0.287	J	ND		ND		0.211	J	0.725		ND		ND		0.614	
Benzo(k)fluoranthene	0.8	3.9	56	110	0.389		**1.45**		0.574		ND		**0.903**		ND		0.34		ND		ND		0.196	J	0.552		0.191	J	ND		0.765	
Carbazole	--	--	--	--	ND		0.475		0.245	J	ND		0.279	J	ND		ND		ND		ND		ND		0.213	J	ND		ND		0.233	J
Chrysene	1	3.9	56	110	0.891		**2.64**		**1.14**		1	J	**1.52**		ND		0.527		ND		0.336	J	0.273	J	**1.08**		0.307	J	ND		**1.81**	
Dibenzo(a,h)anthracene	0.33	0.33	0.56	1.1	ND		**0.545**		0.241	J	ND		0.265	J	ND		ND		ND		ND		ND		0.22	J	ND		ND		0.235	J
Dibenzofuran	7	59	350	1000	ND		0.435		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.214	J
Fluoranthene	100	100	500	1000	1.39		5.19		2.1		2.03		3.57		ND		1.19		ND		0.481		0.506		2.09		0.661		0.313	J	3.19	
Fluorene	30	100	500	1000	ND		0.68		0.267	J	ND		0.268		ND		ND		ND		ND		ND		0.209	J	ND		ND		0.381	
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	11	0.478		**2.13**		**0.989**		**1.11**	J	**1.38**	J	ND		0.494		ND		0.197	J	0.285	J	**1.09**		0.212	J	ND		**0.899**	
Naphthalene	12	100	500	1000	ND		0.0062		0.521		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Phenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
2-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
3-Methylphenol/4-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Phenanthrene	100	100	500	1000	1.81		4.84		1.63		1.96		2.56		ND		0.464		ND		0.545		0.302	J	1.85		0.66		0.21	J	2.76	
Pyrene	100	100	500	1000	1.75	JP	4.2		1.74		1.74		2.92		ND		0.978		ND		0.605		0.399		1.74		0.551		0.248	J	2.31	
Total Metals - mg/Kg																																
Arsenic	13	16	16	16	3.16		9.42		4.12		3.09		4.72		3.93		**13.9**		3.51		ND		5.71		9.23		8.52		7.62		ND	
Barium	350	400	400	10000	64.9		164		45.6		48.9		86.4		22.6		89.8		92		103		82.3		104		67.4		79.6		42.6	
Beryllium	7.2	72	590	2700	0.327		0.463		0.225	J	0.858		0.365		0.243	J	0.899		0.576		0.635		0.329		0.157	J	0.372		0.619		0.194	J
Cadmium	2.5	4.3	9.3	60	0.659		1.67		0.662		0.383		0.781		0.439		0.868		0.831		0.848		0.788		1.09		0.942		0.761		0.412	
Hex Chromium	1	110	400	800	NT		NT		NT		NT		NT		NT		NT		NT		NT		NT		NT		NT		NT		NT	
Chromium	30	180	1500	6800	12.2		14		8.28		7.3		11.8		12.6		6.53		17.5		19.4		25.7		12.9		11.1		17.2		4.97	
Copper	50	270	270	10000	20.5		**278**		30.2		14.6		26.6		10.3		30.7		15.3		16.7		33.5		34.1		26.5		29.7		21.4	
Cyanide	27	27	27	10000	0.479		0.394	J	0.269	J	0.408	JM	0.304	J	0.319	J	0.259	J	ND		ND		0.277	J	0.288	J	ND		ND		0.347	J
Lead	63	400	1000	3900	**168**		**345**		**66**		32.2		**201**		21.7		**85.4**		15.9		21.4		**196**		**162**		**129**		21.3		**210**	
Manganese	1600	2000	10000	10000	313		255		256		373		338		191		200		178		503		273		410		588		339			
Mercury	0.18	0.81	2.8	5.7	**1.55**		**0.36**		**0.277**		ND		**0.377**		**0.292**		**0.264**		0.0409		0.0431		0.0191		**0.246**		0.0719		0.0505		0.0103	
Nickel	30	310	310	10000	9.14		18.2		8.47		7.13		10.3		11.6		4.82		24.8		28.3		10.7		15.6		18		29.5		8.75	
Selenium	3.9	180	1500	6800	ND		ND		ND		ND		1.73		1.37		1.22		2.78		2.98		2.35		3.41		2.43		2.41		1.24	
Silver	2	180	1500	6800	0.879		0.748		0.425	J	ND		0.354	J	ND		ND		0.705		0.798		1.1		1.68		1.02		0.987		0.666	
Zinc	109	10000	10000	10000	**151**		**708**		**113**		49		**144**		61.5		**115**		99.4		104		**145**		**193**		108		82.2		94.7	
Polychlorinated biphenyls (PCBs) - mg/Kg [4]																																
Aroclor 1254	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1260	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		0.184		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Total PCBs	0.1	1	1	25	ND		ND		ND		**0.184**		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Pesticides and Herbicides - mg/Kg [4]																																
4,4'-DDE	0.0033	8.9	62	120	ND		ND		ND		**0.0788**	J	0.00185	NJ	ND		ND		ND		ND		ND		ND		ND		ND		ND	R
4,4'-DDT	0.0033	7.9	47	94	0.00223	NJ	ND		ND		**0.0947**	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
4,4-DDD	0.0033	13	92	180	ND		ND		ND		**0.175**	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Aldrin	0.005	0.097	0.68	1.4	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
alpha-BHC	0.02	0.48	3.4	6.8	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
beta-BHC	0.036	0.36	3	14	ND		ND		ND		0.00437	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
cis-Chlordane	0.094	4.2	24	47	0.0155		ND		ND		ND		ND		ND		0.00468	NJ	ND		ND		ND		0.00815		ND		0.00223	J	ND	R
delta-BHC	0.04	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Dieldrin	0.005	0.2	1.4	2.8	ND		ND		ND		ND		0.00228	NJ	ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Endosulfan I	2.4	24	200	920	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Endosulfan II	2.4	24	200	920	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Endosulfan sulfate	2.4	24	200	920	ND		ND		ND		0.0496	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Endrin	0.014	11	89	410	ND		ND		ND		**0.0369**	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Endrin aldehyde	--	--	--	--	0.00226	J	ND		ND		0.0235	J	ND		ND		ND		0.00182	JP	ND		ND		ND		ND		ND		ND	R
Endrine ketone	--	--	--	--	0.00244	J	0.00581	NJ+	ND		0.0114	P	0.00223	J	ND		ND		ND		ND		ND		ND		ND		ND		ND	R
gamma-BHC (Lindane)	0.1	1.3	9.2	23	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Heptachlor epoxide	--	--	--	--	ND		ND		ND		0.00508	P	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
Methoxychlor	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R
trans-Chlordane	--	--	--	--	ND		ND		ND		0.00379	NJ	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
3. Values per NYSDEC Part 375 Table 375-6.8(b) Restricted Soil Cleanup Objectives.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:

ND = Parameter not detected above laboratory detection limit.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased low.
NJ = The detection is tenative in identification and estimated in value.
R = The sample results are rejected due to deficiencies in meeting Quality Control limits. Tha analyte may or may not be present.

Bold	= Result exceeds Unrestricted Use SCOs.
Bold	= Result exceeds Restricted Residential Use SCOs.
Bold	= Result exceeds Commercial Use SCOs.
Bold	= Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF REMEDIAL INVESTIGATION SUBSURFACE SOIL/FILL SAMPLE ANALYSIS RESULTS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	MW5-14-16ft	Q	MW6-4.5-7ft	Q	MW6-8-10ft	Q	MW6-14-16ft	Q	MW7-2-4ft	Q	MW7-12-14ft	Q	MW7-14-16ft	Q	MW8-0.5-2ft	Q	MW8-12-13ft	Q	MW8-14-15ft	Q	A7-10-11ft	Q	A7-15ft	Q	A9-7-8ft	Q	A9-15ft	Q
					Native		Urban Fill		Construction Fill		Native		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Construction Fill		Native		Urban Fill		Native	
Volatile Organic Compounds (VOCs) - mg/Kg [4]																																
1,2-Dichlorobenzene	**1.1**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
1,2,4-Trimethylbenzene	**3.6**	**52**	**190**	**380**	ND		ND		ND		ND		ND		ND		0.12	J	ND		ND		ND		ND	R	ND	R	ND	R	ND	R
1,3,5-Trimethylbenzene	**8.4**	**52**	**190**	**380**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
2-Butanone (MEK)	**0.12**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	0.0788	R
Acetone	**0.05**	**100**	**500**	**1000**	0.0346		0.0371		0.0177		0.0155		0.0194		0.0142		ND		ND		ND		0.00736	J	~~0.0243~~	R	~~0.191~~	R	~~0.0312~~	R	0.332	R
Benzene	**0.06**	**4.8**	**44**	**89**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	~~0.0536~~	R	ND	R
Carbon disulfide	**--**	**--**	**--**	**--**	ND		ND		0.00123	J	ND		ND		0.00386		ND		ND		ND		0.00141	J	ND	R	ND	R	ND	R	0.0656	R
Chlorobenzene	**1.1**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
cis-1,2-Dichloroethylene	**0.25**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Cyclohexane	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Ethylbenzene	**1**	**41**	**390**	**780**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Isopropylbenzene (Cumene)	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Total Xylenes	**0.26**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	~~0.00405~~	R	ND	R
Methyl acetate	**--**	**--**	**--**	**--**	0.0217		ND		ND		ND		ND		ND		0.12		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Methylcyclohexane	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		0.00184	J	ND		ND		ND		ND		ND	R	ND	R	~~0.00424~~	R	ND	R
Methylene chloride	**0.05**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Naphthalene	**12**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		0.173		**13.2**		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
n-Butylbenzene	**12**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
n-Propylbenzene	**3.9**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
p-Cymene (p-isopropyltoluene)	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
sec-Butylbenzene	**11**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Styrene	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
tert Butyl Methyl Ether	**0.93**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		0.00317		ND		ND		0.00152	J	0.0042		ND	R	ND	R	~~0.00673~~	R	0.00471	R
Toluene	**0.7**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Trichloroethene	**0.47**	**21**	**200**	**400**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Vinyl chloride	**0.02**	**0.9**	**13**	**27**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R	ND	R	ND	R
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg [4]																																
1,1-Biphenyl	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
2-Methylnaphthalene	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		1.65	J	ND		ND		ND		ND		ND		ND		ND		ND	
Acenaphthene	**20**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		2.55		1.15	J	ND		ND		ND		ND		ND		ND		ND	
Acenaphthylene	**100**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.197	J	ND		ND		ND	
Anthracene	**100**	**100**	**500**	**1000**	ND		ND		ND		0.301	J	6.26		2.62		0.28	J	ND		0.234	J	0.39		ND		ND		ND		ND	
Benzo(a)anthracene	**1**	**1**	**5.6**	**11**	ND		0.374		0.245	J	0.416		0.46		**7.14**		**3.14**		**1.38**		ND		0.324	J	0.945		ND		ND		ND	
Benzo(a)pyrene	**1**	**1**	**1**	**1.1**	ND		0.432		0.204	J	0.383		0.358		**6.11**		**2.89**		**1.1**		ND		0.262	J	0.696		ND		ND		ND	
Benzo(b)fluoranthene	**1**	**1**	**5.6**	**11**	ND		0.565		0.208	J	0.443		0.318	J	**5.55**		**2.81**		1.24		ND		0.238	J	0.684		ND		ND		ND	
Benzo(ghi)perylene	**100**	**100**	**500**	**1000**	ND		0.43		ND		0.271	J	0.21	J	3.44		1.78		0.606		ND		ND		0.366		ND		ND		ND	
Benzo(k)fluoranthene	**0.8**	**3.9**	**56**	**110**	ND		0.3	J	ND		0.282	J	0.286	J	**4.73**		**2.04**		0.9		ND		0.138	J	0.483		ND		ND		ND	
Carbazole	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		2.84		1.19		ND		ND		ND		ND		ND		ND		ND	
Chrysene	**1**	**3.9**	**56**	**110**	ND		0.421		0.226	J	0.448		0.424		**6.83**		**3.2**		**1.24**		ND		0.336	J	0.753		ND		ND		ND	
Dibenzo(a,h)anthracene	**0.33**	**0.33**	**0.56**	**1.1**	ND		ND		ND		ND		ND		**1.02**	J	ND		0.199	J	ND		ND		ND		ND		ND		ND	
Dibenzofuran	**7**	**59**	**350**	**1000**	ND		ND		ND		ND		ND		3.4		1.31	J	ND		ND		ND		ND		ND		ND		ND	
Fluoranthene	**100**	**100**	**500**	**1000**	ND		0.806		0.548		1.05		1.03		18.4		8.16		2.26		ND		0.821		1.98		ND		ND		ND	
Fluorene	**30**	**100**	**500**	**1000**	ND		ND		0.194	J	ND		ND		4.2		1.82		ND		ND		ND		ND		ND		ND		ND	
Indeno(1,2,3-cd)pyrene	**0.5**	**0.5**	**5.6**	**11**	ND		**0.53**		0.191	J	0.432		0.32	J	**4.01**		**2.09**		**0.705**		ND		ND		0.441		ND		ND		ND	
Naphthalene	**12**	**100**	**500**	**1000**	ND		ND		0.482		ND		ND		4.5		1.75		ND		ND		ND		ND		ND		ND		ND	
Phenol	**0.33**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
2-Methylphenol	**0.33**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
3-Methylphenol/4-Methylphenol	**0.33**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Phenanthrene	**100**	**100**	**500**	**1000**	ND		0.283	J	0.613		0.678		1.03		24.5		10.3		0.831		ND		0.788		0.896		ND		ND		ND	
Pyrene	**100**	**100**	**500**	**1000**	ND		0.683		0.435		0.843		0.835		14.9		6.74		2.11		ND		0.699		1.35		ND		ND		ND	
Total Metals - mg/Kg																																
Arsenic	**13**	**16**	**16**	**16**	ND		ND		ND		ND		ND		4.45		4.93		7.44		3.31		6.09		2.82		3.28		**16.2**		2.87	
Barium	**350**	**400**	**400**	**10000**	21.7		94.4		21		36.3		58.7		70.2		90	J	93.1		10.8		36.8		29.9		71.1		138		7.28	
Beryllium	**7.2**	**72**	**590**	**2700**	0.32		0.707		ND		0.244	J	0.347		0.501		0.74		0.315		ND		0.416		0.188	J	0.683		1.17		ND	
Cadmium	**2.5**	**4.3**	**9.3**	**60**	0.348		1.22		0.276	J	0.413		0.511		2.31		0.579		1.34		ND		0.28	J	0.58		0.253	J	ND		0.294	J
Hex Chromium	**1**	**110**	**400**	**800**	NT		NT		NT		NT		NT		NT		NT		NT		NT		NT		ND		NT		NT		ND	
Chromium	**30**	**180**	**1500**	**6800**	8.18		11.7		5.2		6.09		7.55		10.2		11.9		12.2		4.81		14.5		5.31		18.7		19.8		3.65	
Copper	**50**	**270**	**270**	**10000**	20.2		13.4		8.45		10.1		23.4		16.7		20.6	D	22		3.55		22		17.4		24.4		35.3		3.14	
Cyanide	**27**	**27**	**27**	**10000**	ND		0.513	J	ND		0.334	J	0.451	J	0.649		NT		0.281	J	ND		NT		ND		ND		7.95		ND	
Lead	**63**	**400**	**1000**	**3900**	8.84		50		32.8		56.7		**155**		**150**		**90.3**	J	**83.2**		6.05		15.2		**75**		12.4		**339**		3.37	
Manganese	**1600**	**2000**	**10000**	**10000**	60.7		871		225		232		258		420	J	428	D	277		183		228		344		169		1420		96.6	
Mercury	**0.18**	**0.81**	**2.8**	**5.7**	0.0114		0.0297		0.0185		0.0791		**0.828**		0.0185	DM	0.0504	M	0.171		0.0141		0.0315		0.0575		0.0689		0.12		0.00977	
Nickel	**30**	**310**	**310**	**10000**	16.6		14.8		4.04		5.07		5.29		9.77		13.1		10.1		8.34		17.8		7.34		**32**		14.6		6.45	
Selenium	**3.9**	**180**	**1500**	**6800**	0.922		3.53		1.08		1.48		1.68		1.72		1.95		ND		ND		0.484	J	2.03		1.93		ND		1.06	
Silver	**2**	**180**	**1500**	**6800**	ND		1.66		0.536	J	0.629		0.432	J	0.673		0.771		ND		ND		ND		ND		ND		ND		ND	
Zinc	**109**	**10000**	**10000**	**10000**	42		94.5		54		66.4		**291**		**229**		66.8		**240**		28.6		66.2		57.2		72.1		**175**		20.2	
Polychlorinated biphenyls (PCBs) - mg/Kg [4]																																
Aroclor 1254	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1260	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Total PCBs	**0.1**	**1**	**1**	**25**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Pesticides and Herbicides - mg/Kg [4]																																
4,4'-DDE	**0.0033**	**8.9**	**62**	**120**	ND		ND		ND		ND		ND		ND		ND		**0.00819**	J+	ND		ND		ND		ND		ND		ND	
4,4'-DDT	**0.0033**	**7.9**	**47**	**94**	ND		ND		ND		ND		ND		ND		ND		**0.0726**	J+	ND		ND		ND		ND		ND		ND	
4,4-DDD	**0.0033**	**13**	**92**	**180**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aldrin	**0.005**	**0.097**	**0.68**	**1.4**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
alpha-BHC	**0.02**	**0.48**	**3.4**	**6.8**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
beta-BHC	**0.036**	**0.36**	**3**	**14**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
cis-Chlordane	**0.094**	**4.2**	**24**	**47**	ND		ND		0.00174	J	ND		0.00537	J+	ND		ND		0.023	J+	ND		ND		0.00396		ND		ND		ND	
delta-BHC	**0.04**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Dieldrin	**0.005**	**0.2**	**1.4**	**2.8**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Endosulfan I	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Endosulfan II	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Endosulfan sulfate	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		ND		ND		ND		0.00527	NJ	0.00214	J	0.00394	NJ	ND		ND		ND	
Endrin	**0.014**	**11**	**89**	**410**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Endrin aldehyde	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		0.00855	J+	ND		ND		ND		ND		ND		ND	
Endrine ketone	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		0.00317	NJ+	ND		ND		ND		ND		ND		ND	
gamma-BHC (Lindane)	**0.1**	**1.3**	**9.2**	**23**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Heptachlor epoxide	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Methoxychlor	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.01	NJ	ND		0.00743	NJ	ND	
trans-Chlordane	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND		ND		0.00355	J+	ND		ND		ND		ND		ND		ND	

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
3. Values per NYSDEC Part 375 Table 375-6.8(b) Restricted Soil Cleanup Objectives.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:
ND = Parameter not detected above laboratory detection limit.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased low.
NJ = The detection is tenative in identification and estimated in value.
R = The sample results are rejected due to deficiencies in meeting Quality Control limits. Tha analyte may or may not be present.

Bold	= Result exceeds Unrestricted Use SCOs.
Bold	= Result exceeds Restricted Residential Use SCOs.
Bold	= Result exceeds Commercial Use SCOs.
Bold	= Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF REMEDIAL INVESTIGATION SUBSURFACE SOIL/FILL SAMPLE ANALYSIS RESULTS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	B2-2.5-4	Q	DUP-E-012617	Q	B3-3-4ft	Q	B4-2-4ft	Q	B5-6-8ft	Q	B6-5-6ft	Q	B8-15ft	Q	B9-10-11ft	Q	BM9-10.5	Q	Blind Duplicate	Q	C1-6-7ft	Q	C2-6.5-7.5ft	Q	C2-15ft	Q	C4-7-8ft	Q
					Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Native		Construction Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill	
Volatile Organic Compounds (VOCs) - mg/Kg [4]																																
1,2-Dichlorobenzene	1.1	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
1,2,4-Trimethylbenzene	3.6	52	190	380	ND	R	ND	R	~~0.0236~~	R	ND		ND	R	~~0.00714~~	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
1,3,5-Trimethylbenzene	8.4	52	190	380	ND	R	ND	R	~~0.00703~~	R	ND		ND	R	~~0.00267~~	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
2-Butanone (MEK)	0.12	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		~~0.0196~~	R	~~0.0222~~	R	ND	R	ND	R
Acetone	0.05	100	500	1000	~~0.0608~~	R	ND	R	~~0.0762~~	R	0.334	J	~~0.0462~~	R	~~0.134~~	R	~~0.0603~~	R	ND	R	ND		ND		~~0.209~~	R	~~0.18~~	R	ND	R	~~0.0461~~	R
Benzene	0.06	4.8	44	89	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Carbon disulfide	--	--	--	--	~~0.00389~~	R	ND	R	~~0.00969~~	R	0.0858		~~0.00803~~	R	~~0.0343~~	R	ND	R	ND	R	ND		ND		~~0.0124~~	R	~~0.00801~~	R	ND	R	~~0.00243~~	R
Chlorobenzene	1.1	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
cis-1,2-Dichloroethylene	0.25	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Cyclohexane	--	--	--	--	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Ethylbenzene	1	41	390	780	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Isopropylbenzene (Cumene)	--	--	--	--	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Total Xylenes	0.26	100	500	1000	ND	R	ND	R	~~0.00432~~	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Methyl acetate	--	--	--	--	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Methylcyclohexane	--	--	--	--	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		~~0.00671~~	R	ND	R	ND	R	ND	R
Methylene chloride	0.05	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		~~0.00822~~	R	ND	R	ND	R	ND	R
Naphthalene	12	100	500	1000	ND	R	ND	R	0.085	R	ND		~~0.0194~~	R	~~0.0317~~	R	ND	R	~~0.0104~~	R	ND		ND		ND	R	~~0.0213~~	R	ND	R	ND	R
n-Butylbenzene	12	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
n-Propylbenzene	3.9	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
p-Cymene (p-isopropyltoluene)	--	--	--	--	ND	R	ND	R	~~0.00743~~	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
sec-Butylbenzene	11	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Styrene	--	--	--	--	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
tert Butyl Methyl Ether	0.93	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Toluene	0.7	100	500	1000	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Trichloroethene	0.47	21	200	400	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Vinyl chloride	0.02	0.9	13	27	ND	R	ND	R	ND	R	ND		ND	R	ND	R	ND	R	ND	R	ND		ND		ND	R	ND	R	ND	R	ND	R
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg [4]																																
1,1-Biphenyl	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
2-Methylnaphthalene	--	--	--	--	ND		ND		0.249	J	ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Acenaphthene	20	100	500	1000	ND		ND		ND		0.278	J	0.335	J	ND		ND		ND		NT		NT		ND		ND		ND		ND	
Acenaphthylene	100	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Anthracene	100	100	500	1000	0.544		ND		ND		0.545		0.822		0.258	J	0.206	J	0.509		NT		NT		ND		0.318	J	ND		ND	
Benzo(a)anthracene	1	1	5.6	11	0.749		ND		0.376	J	0.901		**1.25**		0.477		0.203	J	0.547		NT		NT		0.184	J	0.541		0.23	J	ND	
Benzo(a)pyrene	1	1	1	1.1	0.571		ND		0.363	J	0.709		0.967		0.395		0.152	J	0.508		NT		NT		ND		0.408		0.194	J	ND	
Benzo(b)fluoranthene	1	1	5.6	11	0.566		ND		0.309	J	0.681		**1.04**		0.484		ND		0.471		NT		NT		0.218	J	0.391		0.251	J	ND	
Benzo(ghi)perylene	100	100	500	1000	0.328	J	ND		ND		0.439		0.616		0.315	J	ND		0.362		NT		NT		ND		0.217	J	ND		ND	
Benzo(k)fluoranthene	0.8	3.9	56	110	0.356	J	ND		0.242	J	0.401		0.565		0.242	J	ND		0.423		NT		NT		ND		0.257	J	ND		ND	
Carbazole	--	--	--	--	0.262	J	ND		ND		0.265	J	0.402		ND		ND		ND		NT		NT		ND		0.168	J	ND		ND	
Chrysene	1	3.9	56	110	0.705		ND		0.356	J	0.794		**1.12**		0.442		0.194	J	0.576		NT		NT		0.232	J	0.463		0.25	J	ND	
Dibenzo(a,h)anthracene	0.33	0.33	0.56	1.1	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Dibenzofuran	7	59	350	1000	ND		ND		ND		ND		0.235	J	ND		ND		ND		NT		NT		ND		ND		ND		ND	
Fluoranthene	100	100	500	1000	1.76		0.274	JN	0.484		2.44		3.01		1.22		0.489		1.3		NT		NT		0.41		1.44		0.475		ND	
Fluorene	30	100	500	1000	0.223	J	ND		ND		0.28	J	0.397		ND		ND		ND		NT		NT		ND		0.169	J	ND		ND	
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	11	0.253	J	ND		ND		0.459		0.434		0.35		ND		0.296	J	NT		NT		ND		0.233	J	ND		ND	
Naphthalene	12	100	500	1000	ND		ND		0.085		ND		0.227	J	ND		ND		ND		NT		NT		ND		ND		ND		ND	
Phenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
2-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
3-Methylphenol/4-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Phenanthrene	100	100	500	1000	2.03		ND		0.326	J	2.27		3.16		1.08		0.466		0.967		NT		NT		0.377		1.28		0.373		ND	
Pyrene	100	100	500	1000	1.33		0.228	J	0.442	J	1.92		2.3	J	0.795		0.35		1.02		NT		NT		0.328	J	1.06		0.393		ND	
Total Metals - mg/Kg																																
Arsenic	13	16	16	16	5.82		5.07		1.69		3.35		3.85	D	7.33		6.64		8.55		NT		NT		**16.6**		3.28		3.03		1.23	
Barium	350	400	400	10000	13.2		16.1		34.6		57.2	J	78.5	J	128		27.0		31.4		NT		NT		65.3		92.7		59.8		12.1	
Beryllium	7.2	72	590	2700	ND		0.181	J	0.231	J	0.351		0.361	D	0.286		0.192	J	0.349		NT		NT		0.509		0.459		0.393		ND	
Cadmium	2.5	4.3	9.3	60	0.349		0.367		0.436		0.781		1.0	J	0.811		0.187	J	0.303		NT		NT		1.57		0.924		0.708		0.295	J
Hex Chromium	1	110	400	800	NT		NT		ND		ND		NT		NT		NT		NT		NT		NT		ND		NT		NT		NT	
Chromium	30	180	1500	6800	3.65		3.97		6.38		12.6		23.1		12.0		5.68		7.76		NT		NT		14.6		13.5		11.7		4.86	
Copper	50	270	270	10000	2.49		3.63		7.19		13.6	J	20.9	D	25.1		9.88		22.1		NT		NT		**236**		14.9		11.9		6.28	
Cyanide	27	27	27	10000	ND		0.453	J	2.99		ND		1.47	J	1.91		ND		ND		NT		NT		ND		ND		1.27		ND	
Lead	63	400	1000	3900	~~21~~	R	~~1180~~	R	**69.7**				**102**	J	**102**		4.90		30.7		NT		NT		**423**		49.6		**95.7**		8.78	
Manganese	1600	2000	10000	10000	114		122		255		265		568	D	327		383		447		NT		NT		505		273		345		158	
Mercury	0.18	0.81	2.8	5.7	0.0196	J	0.0485	J	0.166		~~0.295~~	R	**0.288**	J	**0.422**		ND		0.0225		NT		NT		**0.49**		0.164		0.136		0.0181	
Nickel	30	310	310	10000	7.75		7.6		4.34		10.4		9.88	J	10.0		16.2		12.3		NT		NT		17.9		13.7		9.87		3.73	
Selenium	3.9	180	1500	6800	ND		ND		1.65		2.5		1.01	J	3.34		2.67		2.84		NT		NT		**7.7**		2.01		2.04		ND	
Silver	2	180	1500	6800	0.302	J	0.349	J	ND		ND		0.506	J	0.412	J	ND		ND		NT		NT		ND		ND		ND		ND	
Zinc	109	10000	10000	10000	32.6		35		83.9		~~84.0~~	R	**152**	J	**119**		50.0		45.6		NT		NT		**383**		91.7		72.0		61.5	
Polychlorinated biphenyls (PCBs) - mg/Kg [4]																																
Aroclor 1254	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Aroclor 1260	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Total PCBs	0.1	1	1	25	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Pesticides and Herbicides - mg/Kg [4]																																
4,4'-DDE	0.0033	8.9	62	120	ND		ND		ND		ND		0.00207	NJ	ND		ND		ND		NT		NT		ND		ND		ND		ND	
4,4'-DDT	0.0033	7.9	47	94	ND		ND		ND		ND		ND		**0.0041**		ND		ND		NT		NT		ND		ND		ND		ND	
4,4-DDD	0.0033	13	92	180	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Aldrin	0.005	0.097	0.68	1.4	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
alpha-BHC	0.02	0.48	3.4	6.8	ND		ND		ND		ND		ND		ND		0.00234	J	ND		NT		NT		ND		ND		ND		ND	
beta-BHC	0.036	0.36	3	14	ND		ND		ND		0.00827	J	ND		0.00337	NJ	ND		ND		NT		NT		ND		ND		ND		ND	
cis-Chlordane	0.094	4.2	24	47	ND		ND		ND		ND		0.00628	J	ND		ND		ND		NT		NT		ND		ND		ND		ND	
delta-BHC	0.04	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Dieldrin	0.005	0.2	1.4	2.8	ND		ND		ND		ND		ND		ND		ND		**0.00583**		NT		NT		ND		ND		ND		ND	
Endosulfan I	2.4	24	200	920	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Endosulfan II	2.4	24	200	920	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Endosulfan sulfate	2.4	24	200	920	ND		ND		0.00241	J	ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Endrin	0.014	11	89	410	ND		ND		ND		ND		ND		0.00185	J	ND		0.00211	NJ	NT		NT		ND		ND		ND		ND	
Endrin aldehyde	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		0.002	J	NT		NT		ND		ND		ND		ND	
Endrine ketone	--	--	--	--	ND		ND		ND		ND		0.00384	J	ND		ND		ND		NT		NT		ND		ND		ND		ND	
gamma-BHC (Lindane)	0.1	1.3	9.2	23	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	
Heptachlor epoxide	--	--	--	--	ND		ND		ND		ND		0.00318	J	ND		ND		ND		NT		NT		ND		ND		ND		ND	
Methoxychlor	--	--	--	--	0.00568		0.00453	J	ND		0.0115	JN	ND		0.0282	NJ	ND		ND		NT		NT		ND		0.01		ND		ND	
trans-Chlordane	--	--	--	--	ND		ND		ND		ND		ND		ND		ND		ND		NT		NT		ND		ND		ND		ND	

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
3. Values per NYSDEC Part 375 Table 375-6.8(b) Restricted Soil Cleanup Objectives.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:
ND = Parameter not detected above laboratory detection limit.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased low.
NJ = The detection is tenative in identification and estimated in value.
R = The sample results are rejected due to deficiencies in meeting Quality Control limits. Tha analyte may or may not be present.

Bold	= Result exceeds Unrestricted Use SCOs.
Bold	= Result exceeds Restricted Residential Use SCOs.
Bold	= Result exceeds Commercial Use SCOs.
Bold	= Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF REMEDIAL INVESTIGATION SUBSURFACE SOIL/FILL SAMPLE ANALYSIS RESULTS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	C5-11ft	Q	BMC5-11ft	Q	C7-10-12ft	Q	C8-7-8ft	Q	C8-15-16ft	Q	D1-3-4ft	Q	DUPC-012517	Q	BMD1-3.5FT	Q	D2-3ft	Q	D2-15ft	Q	DUPD-012517	Q	D3-4ft	Q	D4-10-12ft	Q	DUPB-010617	Q
					Urban Fill		Urban Fill		Urban Fill		Construction Fill		Native		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Construction Fill		Construction Fill		Urban Fill		Urban Fill		Urban Fill	
Volatile Organic Compounds (VOCs) - mg/Kg [4]																																
1,2-Dichlorobenzene	1.1	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
1,2,4-Trimethylbenzene	3.6	52	190	380	~~0.0037~~	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
1,3,5-Trimethylbenzene	8.4	52	190	380	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
2-Butanone (MEK)	0.12	100	500	1000	ND	R	ND		ND	R	ND	R	~~0.179~~	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Acetone	0.05	100	500	1000	~~0.0535~~	R	0.00312		~~0.0585~~	R	ND	R	~~0.537~~	R	0.0473	J	0.0471	J	0.0181	J	**0.084**	J	0.0393	J	0.046	J	0.0158	J	~~0.0329~~	R	~~0.0375~~	R
Benzene	0.06	4.8	44	89	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Carbon disulfide	--	--	--	--	~~0.0105~~	R	ND		~~0.00258~~	R	ND	R	~~0.0049~~	R	ND		0.00495		ND		0.00747		ND		ND		0.00754		ND	R	ND	R
Chlorobenzene	1.1	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
cis-1,2-Dichloroethylene	0.25	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Cyclohexane	--	--	--	--	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Ethylbenzene	1	41	390	780	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Isopropylbenzene (Cumene)	--	--	--	--	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Total Xylenes	0.26	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Methyl acetate	--	--	--	--	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Methylcyclohexane	--	--	--	--	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		~~0.0125~~	R	~~0.00962~~	R
Methylene chloride	0.05	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Naphthalene	12	100	500	1000	~~0.35~~	R	0.012		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
n-Butylbenzene	12	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
n-Propylbenzene	3.9	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
p-Cymene (p-isopropyltoluene)	--	--	--	--	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
sec-Butylbenzene	11	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Styrene	--	--	--	--	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
tert Butyl Methyl Ether	0.93	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Toluene	0.7	100	500	1000	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		0.00197	J	ND	R	ND	R
Trichloroethene	0.47	21	200	400	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Vinyl chloride	0.02	0.9	13	27	ND	R	ND		ND	R	ND	R	ND	R	ND		ND		ND		ND		ND		ND		ND		ND	R	ND	R
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg [4]																																
1,1-Biphenyl	--	--	--	--	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
2-Methylnaphthalene	--	--	--	--	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Acenaphthene	20	100	500	1000	4.96		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Acenaphthylene	100	100	500	1000	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		0.169	J	ND	
Anthracene	100	100	500	1000	15.8		NT		ND		ND		ND		ND		ND		NT		0.37		ND		ND		0.409		0.538		ND	
Benzo(a)anthracene	1	1	5.6	11	22.2		NT		ND		0.227	J	ND		ND		0.178	J	NT		**1.14**		ND		ND		**1.17**		**1.4**		0.162	J
Benzo(a)pyrene	1	1	1	1.1	18.4		NT		ND		0.247	J	ND		ND		ND		NT		0.986		ND		ND		0.957		**1.01**		ND	
Benzo(b)fluoranthene	1	1	5.6	11	15.8		NT		ND		0.287	J	ND		ND		ND		NT		0.934		ND		ND		0.971		0.854		ND	
Benzo(ghi)perylene	100	100	500	1000	9.83		NT		ND		0.18	J	ND		ND		ND		NT		0.663		ND		ND		0.606		0.464		ND	
Benzo(k)fluoranthene	0.8	3.9	56	110	**13.4**		NT		ND		0.241	J	ND		ND		ND		NT		0.712		ND		ND		0.612		0.732		ND	
Carbazole	--	--	--	--	5.47		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Chrysene	1	3.9	56	110	**20.9**		NT		ND		0.336		ND		ND		0.167	J	NT		**1.04**		ND		ND		**1.01**		**1.2**		ND	
Dibenzo(a,h)anthracene	0.33	0.33	0.56	1.1	**4.1**		NT		ND		ND		ND		ND		ND		NT	J	0.228	J	ND		ND		0.201	J	0.269	J	ND	
Dibenzofuran	7	59	350	1000	4.34		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Fluoranthene	100	100	500	1000	53.5		NT		ND		0.756		ND		0.241	J	0.317		NT		2.19		ND		ND		2.14		2.63		0.29	J
Fluorene	30	100	500	1000	7.1		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	11	**7.86**		NT		ND		ND		ND		ND		ND		NT		**0.736**		ND		ND		**0.741**		0.361		ND	
Naphthalene	12	100	500	1000	2.42	J	NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Phenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
2-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
3-Methylphenol/4-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Phenanthrene	100	100	500	1000	49.6		NT		ND		0.463		ND		ND		0.199	J	NT		1.31		ND		ND		1.31		1.62		ND	
Pyrene	100	100	500	1000	41.9		NT		ND		0.683		ND		0.212	J	0.271	J	NT		1.73		ND		ND		1.65		2.12		0.254	J
Total Metals - mg/Kg																																
Arsenic	13	16	16	16	4.52		NT		1.09	D	1.50		9.76		2.14		1.90		NT		5.10		2.99		2.79		**14.9**		2.87		2.88	
Barium	350	400	400	10000	54.1		NT		19.8	J	11.4		70.3		32.4		23.7	J	NT		77.8	J	9.59	J	9.57	J	57.6	J	51.9		40.2	
Beryllium	7.2	72	590	2700	0.356		NT		0.162	J	0.153	J	0.637		0.223	J	0.195	J	NT		0.482		ND		ND		0.551		0.300		0.590	
Cadmium	2.5	4.3	9.3	60	0.234	J	NT		0.192	J	0.369		0.916		0.575		0.530		NT		1.52		0.405		0.405		1.32		0.422		0.305	
Hex Chromium	1	110	400	800	ND		NT		ND		NT		ND		NT		NT		NT		NT		NT		NT		NT		NT		NT	
Chromium	30	180	1500	6800	9.05		NT		5.86	D	5.63		19.4		7.81		6.53		NT		**30.1**		4.55		3.51		11.2		9.70		7.50	
Copper	50	270	270	10000	8.18		NT		7.06		7.24		30.5		7.99	J	7.21	J	NT		35.4	J	1.72	J	1.60	J	42.4	J	12.4		8.11	
Cyanide	27	27	27	10000	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Lead	63	400	1000	3900	**291**		NT		14.8	J	21.8		17.2		40.8		14.1		NT		**149**		4.04		3.98		**86.2**		**205**	J	**66.6**	J
Manganese	1600	2000	10000	10000	259		NT		221	J	200		244		262		296		NT		**4470**		149		146		381		286	J	433	J
Mercury	0.18	0.81	2.8	5.7	0.130		NT		0.0249		0.139		0.0279		~~0.0701~~	R	~~0.0177~~		NT		~~0.451~~	R	ND		ND		~~0.228~~	R	ND		0.0715	J
Nickel	30	310	310	10000	6.55		NT		4.95		4.53		**38.4**		6.46		5.39		NT		9.96		7.00		6.89		28.4		7.23		4.51	
Selenium	3.9	180	1500	6800	1.48		NT		0.969	J	ND		1.37		0.607		ND		NT		**4.54**		0.505	J	0.517	J	**4.03**		0.701		1.28	
Silver	2	180	1500	6800	ND		NT		ND		1.84		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Zinc	109	10000	10000	10000	96.2		NT		61.2		105		86.7		~~62.1~~	R	~~51.8~~	R	NT		~~108~~	R	~~21.7~~	R	~~20.8~~	R	~~123~~	R	72.6	J	40.4	J
Polychlorinated biphenyls (PCBs) - mg/Kg [4]																																
Aroclor 1254	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		0.0191	J	ND		ND	
Aroclor 1260	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Total PCBs	0.1	1	1	25	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		0.0191	J	ND		ND	
Pesticides and Herbicides - mg/Kg [4]																																
4,4'-DDE	0.0033	8.9	62	120	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
4,4'-DDT	0.0033	7.9	47	94	**0.00661**	J	NT		ND		ND		ND		ND		ND		NT		0.00326	J	ND		ND		0.00268	J	ND		ND	
4,4-DDD	0.0033	13	92	180	ND		NT		ND		ND		ND		ND		ND		NT		**0.00679**	J	ND		ND		ND		ND		ND	
Aldrin	0.005	0.097	0.68	1.4	**0.0159**		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
alpha-BHC	0.02	0.48	3.4	6.8	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
beta-BHC	0.036	0.36	3	14	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
cis-Chlordane	0.094	4.2	24	47	ND		NT		ND		0.0149		ND		ND		ND		NT		0.0039	JN	ND		ND		0.00757		ND		ND	
delta-BHC	0.04	100	500	1000	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Dieldrin	0.005	0.2	1.4	2.8	ND		NT		ND		ND		ND		ND		ND		NT		0.00197	J	ND		ND		ND		ND		ND	
Endosulfan I	2.4	24	200	920	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Endosulfan II	2.4	24	200	920	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Endosulfan sulfate	2.4	24	200	920	ND		NT		ND		ND		ND		ND		ND		NT		0.00515	JN	ND		ND		0.00489	JN	ND		ND	
Endrin	0.014	11	89	410	0.00503	J	NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Endrin aldehyde	--	--	--	--	ND		NT		0.00235	J	ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	
Endrine ketone	--	--	--	--	0.0241		NT		ND		0.0027	J	ND		ND		ND		NT		0.00655	J	ND		ND		0.00457	J	ND		ND	
gamma-BHC (Lindane)	0.1	1.3	9.2	23	ND		NT		ND		ND		0.00375	NJ	ND		ND		NT		ND		ND		ND		ND		ND		ND	
Heptachlor epoxide	--	--	--	--	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		0.00188	J	ND		ND	
Methoxychlor	--	--	--	--	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		0.0132		ND		ND	
trans-Chlordane	--	--	--	--	ND		NT		ND		ND		ND		ND		ND		NT		ND		ND		ND		ND		ND		ND	

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
3. Values per NYSDEC Part 375 Table 375-6.8(b) Restricted Soil Cleanup Objectives.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:

ND = Parameter not detected above laboratory detection limit.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased low.
NJ = The detection is tenative in identification and estimated in value.
R = The sample results are rejected due to deficiencies in meeting Quality Control limits. Tha analyte may or may not be present.

Bold = Result exceeds Unrestricted Use SCOs.
Bold = Result exceeds Restricted Residential Use SCOs.
Bold = Result exceeds Commercial Use SCOs.
Bold = Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF REMEDIAL INVESTIGATION SUBSURFACE SOIL/FILL SAMPLE ANALYSIS RESULTS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	D4-15ft	Q	D5-6-8ft	Q	D6-2-4ft	Q	D7-10-11ft	Q	TP-D7-SOUTH-1 (10-12)	Q	TP-D7-EAST-1 (10-12)	Q	TP-D7-NORTH-1 (10-12)	Q	TP-D7-WEST-2 (3-5)	Q	TP-D7-WEST-2 (5-7)	Q	TP-D7-WEST-2 (7-9)	Q	D7-15-16ft	Q	D8-5-6ft	Q	E2-7.5-8.5ft	Q	E3-5-6ft	Q	E3-15ft	Q	E5-3-4ft	Q	BME5-3.5ft	Q	E5-15-16ft	Q	BME5-15.5ft	Q	E6-7-8ft	Q
					Native		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Urban Fill		Construction Fill		Urban Fill		Urban Fill		Native		Native		Urban Fill	
Volatile Organic Compounds (VOCs) - mg/Kg 4																																											
1,2-Dichlorobenzene	1.1	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
1,2,4-Trimethylbenzene	3.6	52	190	380	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	~~43.5~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
1,3,5-Trimethylbenzene	8.4	52	190	380	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	~~16.3~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
2-Butanone (MEK)	0.12	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		0.0144	J	ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Acetone	0.05	100	500	1000	~~0.0633~~	R	~~0.0688~~	R	~~0.0384~~	R	ND		**0.15**	J	NT		NT		ND		0.0071		NT		**0.0689**	J	~~0.0109~~	R	~~0.186~~	R	ND	R	~~0.045~~	R	ND	R	0.0229		~~0.0518~~	R	ND		0.0456	
Benzene	0.06	4.8	44	89	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Carbon disulfide	--	--	--	--	~~0.0035~~	R	~~0.00783~~	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		~~0.00226~~	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Chlorobenzene	1.1	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		0.00648	
cis-1,2-Dichloroethylene	0.25	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Cyclohexane	--	--	--	--	ND	R	ND	R	ND	R	ND		0.8	J	NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Ethylbenzene	1	41	390	780	ND	R	ND	R	ND	R	ND		0.3		NT		NT		0.057	J+	ND		NT		ND		ND	R	ND	R	~~3.31~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
Isopropylbenzene (Cumene)	--	--	--	--	ND	R	ND	R	ND	R	ND		0.12		NT		NT		0.18	J+	ND		NT		ND		ND	R	ND	R	~~2.87~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
Total Xylenes	0.26	100	500	1000	ND	R	ND	R	ND	R	ND		0.153	J	NT		NT		0.155	J+	ND		NT		ND		ND	R	ND	R	~~8.26~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
Methyl acetate	--	--	--	--	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Methylcyclohexane	--	--	--	--	ND	R	ND	R	ND	R	ND		2.4		NT		NT		0.12	J+	ND		NT		ND		ND	R	ND	R	~~5.83~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
Methylene chloride	0.05	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		~~0.00672~~	R	ND	R	ND	R	~~0.00662~~	R	ND	R	ND		ND	R	ND		ND	
Naphthalene	12	100	500	1000	ND	R	ND	R	ND	R	**28.3**		ND		NT		NT		ND		ND		NT		ND		ND	R	1.88	R	~~6.04~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
n-Butylbenzene	12	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	~~11.8~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
n-Propylbenzene	3.9	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	~~6.39~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
p-Cymene (p-isopropyltoluene)	--	--	--	--	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
sec-Butylbenzene	11	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	~~6.5~~	R	ND	R	ND	R	ND		ND	R	ND		ND	
Styrene	--	--	--	--	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
tert Butyl Methyl Ether	0.93	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Toluene	0.7	100	500	1000	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Trichloroethene	0.47	21	200	400	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Vinyl chloride	0.02	0.9	13	27	ND	R	ND	R	ND	R	ND		ND		NT		NT		ND		ND		NT		ND		ND	R	ND	R	ND	R	ND	R	ND	R	ND		ND	R	ND		ND	
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg 4																																											
1,1-Biphenyl	--	--	--	--	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		3.94		ND		ND		NT		ND		NT		ND	
2-Methylnaphthalene	--	--	--	--	ND		ND		ND		26.2		NT		NT		NT		NT		NT		NT		ND		ND		1.92	J	10.8		ND		ND		NT		ND		NT		ND	
Acenaphthene	20	100	500	1000	ND		ND		ND		**26**		ND		ND		0.056	J	0.58		NT		0.38		ND		ND		3.61		2.51	J	ND		ND		2.12	J	NT		ND		NT		ND	
Acenaphthylene	100	100	500	1000	ND		ND		ND		ND		ND		ND		0.034	J	ND		NT		0.38		ND		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Anthracene	100	100	500	1000	ND		ND		ND		47.5		ND		ND		0.16		0.68		NT		0.36		ND		0.372	J-	10.6		ND		ND		8.31		NT		ND		NT		ND	
Benzo(a)anthracene	1	1	5.6	11	ND		ND		ND		**49.4**		ND		ND		0.34		0.078	J	NT		**1.8**		0.186	J	0.939	J-	**13.6**		ND		0.259	J-	**16.5**		NT		ND		NT		ND	
Benzo(a)pyrene	1	1	1	1.1	ND		ND		ND		**41.6**		ND		ND		0.28		0.064	J	NT		**1.7**		ND		0.954	J-	**9.37**		ND		0.209	J-	**13.7**		NT		ND		NT		ND	
Benzo(b)fluoranthene	1	1	5.6	11	ND		ND		ND		**30.2**		ND		ND		0.36		0.093	J	NT		**2.1**		ND		0.987	J-	**7.18**		ND		0.228	J-	**10.9**		NT		ND		NT		ND	
Benzo(ghi)perylene	100	100	500	1000	ND		ND		ND		19.9		ND		ND		0.14	J	0.049	J	NT		0.92		ND		0.694	J-	4.55		ND		ND		6.28		NT		ND		NT		ND	
Benzo(k)fluoranthene	0.8	3.9	56	110	ND		ND		ND		**38.5**		ND		ND		0.12		ND		NT		**0.86**		ND		0.965	J-	**8.26**		ND		0.179	J-	**12.1**		NT		ND		NT		ND	
Carbazole	--	--	--	--	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		0.379	J-	ND		ND		ND		ND		NT		ND		NT		ND	
Chrysene	1	3.9	56	110	ND		ND		ND		**43.6**		ND		ND		0.32		0.083	J	NT		**2.2**		0.211	J	**1.35**	J-	**11.8**		ND		0.292	J-	**15.5**		NT		ND		NT		ND	
Dibenzo(a,h)anthracene	0.33	0.33	0.56	1.1	ND		ND		ND		**11**	J	ND		ND		0.044	J	ND		NT		0.24		ND		0.289	J-	**2.7**	J	ND		ND		**3.87**		NT		ND		NT		ND	
Dibenzofuran	7	59	350	1000	ND		ND		ND		**35.1**		ND		ND		0.035	J	0.67		NT		0.45		ND		ND		3.1	JP	2.02	J	ND		ND		NT		ND		NT		ND	
Fluoranthene	100	100	500	1000	ND		0.178	J	ND		**127**		0.032	J	ND		0.71		0.24		NT		5.3		0.486		3.07	J-	28.9		ND		0.454	J-	34.2		NT		ND		NT		ND	
Fluorene	30	100	500	1000	ND		ND		ND		**46.8**		ND		ND		0.076	J	1.8		NT		0.58		ND		0.205	J-	4.8		5.13		ND		3.6		NT		ND		NT		ND	
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	11	ND		ND		ND		**13.5**	J	ND		ND		0.16		0.045	J	NT		**1**		ND		0.441	J-	**3.54**	J	ND		ND		**5.35**		NT		ND		NT		ND	
Naphthalene	12	100	500	1000	ND		ND		ND		**107**		0.1	J	ND		0.029	J	0.29		NT		0.88		ND		ND		1.88		4.06		ND		ND		NT		ND		NT		ND	
Phenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		NT		0.066	J	ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
2-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		NT		0.04	J	ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
3-Methylphenol/4-Methylphenol	0.33	100	500	1000	ND		ND		ND		ND		ND		ND		ND		ND		NT		0.1	J	ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Phenanthrene	100	100	500	1000	ND		ND		ND		**177**		0.049	J	ND		0.58		0.26		NT		5.8		0.443		2.3	J-	32		6.22		0.185	J-	26.2		NT		ND		NT		ND	
Pyrene	100	100	500	1000	ND		0.174	J	ND		95.4		0.025	J	ND		0.6		0.29		NT		4.4		0.434		2.6	J-	20.7		ND		0.426	J-	28.7		NT		ND		NT		ND	
Total Metals - mg/Kg																																											
Arsenic	13	16	16	16	4.64		6.21		7.17		4.59		NT		NT		NT		NT		NT		NT		3.02		**24.0**	J	9.59		1.54		3.57		4.90		NT		4.68		NT		1.81	
Barium	350	400	400	10000	33.9		24.8		52.6		57.4		NT		NT		NT		NT		NT		NT		97.7		72.0	J	147		11.0		44.6		122		NT		107		NT		14.7	
Beryllium	7.2	72	590	2700	0.247	J	0.166	J	0.460		0.196	J	NT		NT		NT		NT		NT		NT		0.749		0.518		0.435		0.159	J	0.338		0.734		NT		0.778		NT		ND	
Cadmium	2.5	4.3	9.3	60	0.643		1.23		0.531		0.322		NT		NT		NT		NT		NT		NT		0.602		**3.58**	J	2.32		0.404		0.609		0.784		NT		1.33		NT		0.275	J
Hex Chromium	1	110	400	800	NT		ND		NT		1.0		NT		NT		NT		NT		NT		NT		NT		NT		NT		ND		ND		NT		NT		ND		NT		NT	
Chromium	30	180	1500	6800	9.19		8.59		13.0		9.31		NT		NT		NT		NT		NT		NT		26.1		**30.1**	J	16.2		4.36		10.0		9.28		NT		18.2		NT		8.57	
Copper	50	270	270	10000	45.8	J	27.0		22.6		26.9		NT		NT		NT		NT		NT		NT		24.8		**210**	J	**87.3**		5.90		12.7		32.2		NT		33.7		NT		16.6	
Cyanide	27	27	27	10000	ND		ND		ND		0.544		NT		NT		NT		NT		NT		NT		ND		0.554		NT		ND		1.18		ND		NT		ND		NT		ND	
Lead	63	400	1000	3900	**72.2**		40.5		27.6		34.9		NT		NT		NT		NT		NT		NT		21.2		**518**	J	**291**		8.18		**95.6**		**296**		NT		27.8		NT		39.4	
Manganese	1600	2000	10000	10000	274		480		254		218		NT		NT		NT		NT		NT		NT		275		720	D	161		155		351		218		NT		216		NT		231	
Mercury	0.18	0.81	2.8	5.7	**0.232**	J	0.0551		0.122		**0.478**		NT		NT		NT		NT		NT		NT		0.0408		**1.06**	J	**0.826**		0.130		0.132		**0.225**		NT		0.0535		NT		**1.19**	
Nickel	30	310	310	10000	11.2		8.23		21.3		4.79		NT		NT		NT		NT		NT		NT		**34.0**		**58.0**	J	18.8		3.92		9.81		9.09		NT		28.0		NT		4.55	
Selenium	3.9	180	1500	6800	1.36	D	2.29		ND		ND		NT		NT		NT		NT		NT		NT		0.675		3.79		1.83		1.02		1.16		0.617		NT		1.62		NT		ND	
Silver	2	180	1500	6800	ND		0.380	J	ND		0.307	J	ND		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		0.503	J	NT		ND		NT		ND	
Zinc	109	10000	10000	10000	66.5		55.3		65.7		63.6		NT		NT		NT		NT		NT		NT		98.2		**293**	J	**226**		35.3		68.8		95.7		NT		95.0		NT		61.2	
Polychlorinated biphenyls (PCBs) - mg/Kg 4																																											
Aroclor 1254	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Aroclor 1260	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Total PCBs	0.1	1	1	25	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Pesticides and Herbicides - mg/Kg 4																																											
4,4'-DDE	0.0033	8.9	62	120	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
4,4'-DDT	0.0033	7.9	47	94	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
4,4-DDD	0.0033	13	92	180	ND		ND		ND		**0.00735**		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Aldrin	0.005	0.097	0.68	1.4	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
alpha-BHC	0.02	0.48	3.4	6.8	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		0.00203	J	ND		ND		NT		ND		NT		ND	
beta-BHC	0.036	0.36	3	14	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		0.00359	J	0.00239	NJ	ND		NT		ND		NT		ND	
cis-Chlordane	0.094	4.2	24	47	ND		ND		0.00390		ND		NT		NT		NT		NT		NT		NT		ND		0.0391	J	0.0264		ND		ND		0.0288	J	NT		ND		NT		ND	
delta-BHC	0.04	100	500	1000	ND		ND		ND		0.00594	NJ	NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Dieldrin	0.005	0.2	1.4	2.8	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		**0.00566**	NJ	NT		ND		NT		ND	
Endosulfan I	2.4	24	200	920	ND		ND		ND		0.00383	J	NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Endosulfan II	2.4	24	200	920	ND		ND		ND		0.00436	J	NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Endosulfan sulfate	2.4	24	200	920	ND		ND		0.00627	NJ	ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Endrin	0.014	11	89	410	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Endrin aldehyde	--	--	--	--	ND		ND		ND		0.0191	NJ	NT		NT		NT		NT		NT		NT		ND		ND		0.00424	NJ	ND		ND		0.00471	NJ	NT		ND		NT		ND	
Endrine ketone	--	--	--	--	0.00294	JP	ND		ND		0.00945	NJ	NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		0.00463	NJ	NT		ND		NT		ND	
gamma-BHC (Lindane)	0.1	1.3	9.2	23	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	
Heptachlor epoxide	--	--	--	--	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		0.00287	NJ	ND		NT		ND		NT		ND	
Methoxychlor	--	--	--	--	ND		ND		0.00353	J	0.132	NJ	NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		0.00374	NJ	ND		NT		ND		NT		ND	
trans-Chlordane	--	--	--	--	ND		ND		ND		ND		NT		NT		NT		NT		NT		NT		ND		ND		ND		ND		ND		ND		NT		ND		NT		ND	

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
3. Values per NYSDEC Part 375 Table 375-6.8(b) Restricted Soil Cleanup Objectives.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:

ND = Parameter not detected above laboratory detection limit.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased low.
NJ = The detection is tenative in identification and estimated in value.
R = The sample results are rejected due to deficiencies in meeting Quality Control limits. Tha analyte may or may not be present.

Bold	= Result exceeds Unrestricted Use SCOs.
Bold	= Result exceeds Restricted Residential Use SCOs.
Bold	= Result exceeds Commercial Use SCOs.
Bold	= Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF REMEDIAL INVESTIGATION SUBSURFACE SOIL/FILL SAMPLE ANALYSIS RESULTS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	E8-7-8ft	Q	F1-14.5-16ft	Q	F2-6.5-8ft	Q	F2-15ft	Q	F3-3ft	Q	BMF3-3ft	Q	F3-6.5-8ft	Q	BMF3-7ft	Q	F3-15ft	Q	BMF3-15ft	Q	F4-3ft	Q	F4-COMP 3 FT	Q	F5-6.5-8ft	Q	F5-15ft	Q	F6-11-12ft	Q
					Urban Fill		Urban Fill		Urban Fill		Construction Fill		Urban Fill								Construction Fill		Construction Fill				Urban Fill		Urban Fill		Urban Fill			
Volatile Organic Compounds (VOCs) - mg/Kg 4																																		
1,2-Dichlorobenzene	**1.1**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		~~0.00225~~	R	ND	R	ND	R
1,2,4-Trimethylbenzene	**3.6**	**52**	**190**	**380**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
1,3,5-Trimethylbenzene	**8.4**	**52**	**190**	**380**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
2-Butanone (MEK)	**0.12**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Acetone	**0.05**	**100**	**500**	**1000**	0.045		**0.142**	J	ND		0.0181	J	ND	R	ND		ND		ND		**0.0531**	J	ND		ND		NT		~~0.0508~~	R	~~0.0534~~	R	~~0.0645~~	R
Benzene	**0.06**	**4.8**	**44**	**89**	ND		0.0159		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Carbon disulfide	**--**	**--**	**--**	**--**	0.00241	J	0.0236		ND		ND		~~0.00715~~	R	ND		ND		ND		0.00255	J	ND		ND		NT		~~0.00331~~	R	ND	R	~~0.00338~~	R
Chlorobenzene	**1.1**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
cis-1,2-Dichloroethylene	**0.25**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Cyclohexane	**--**	**--**	**--**	**--**	ND		0.0157	J	ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Ethylbenzene	**1**	**41**	**390**	**780**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Isopropylbenzene (Cumene)	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Total Xylenes	**0.26**	**100**	**500**	**1000**	0.00329	J	0.00383	J	ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Methyl acetate	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Methylcyclohexane	**--**	**--**	**--**	**--**	ND		0.00317	J	ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Methylene chloride	**0.05**	**100**	**500**	**1000**	0.00916	J	ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	~~0.00546~~	R
Naphthalene	**12**	**100**	**500**	**1000**	ND		ND		0.00731	J	ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
n-Butylbenzene	**12**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
n-Propylbenzene	**3.9**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
p-Cymene (p-isopropyltoluene)	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
sec-Butylbenzene	**11**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Styrene	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
tert Butyl Methyl Ether	**0.93**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Toluene	**0.7**	**100**	**500**	**1000**	ND		ND		ND		ND		ND	R	ND		ND		ND		0.00197	J	ND		ND		NT		ND	R	ND	R	ND	R
Trichloroethene	**0.47**	**21**	**200**	**400**	ND		ND		ND		0.00246	J	ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Vinyl chloride	**0.02**	**0.9**	**13**	**27**	ND		ND		ND		ND		ND	R	ND		ND		ND		ND		ND		ND		NT		ND	R	ND	R	ND	R
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg 4																																		
1,1-Biphenyl	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
2-Methylnaphthalene	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Acenaphthene	**20**	**100**	**500**	**1000**	ND		0.222	J	0.631	J	ND		0.196	J	NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Acenaphthylene	**100**	**100**	**500**	**1000**	ND		0.182	J	ND		ND		ND		NT		0.217	J	NT		ND		NT		ND		NT		ND		ND		ND	
Anthracene	**100**	**100**	**500**	**1000**	0.345	J	0.81	J	1.64		ND		0.563		NT		0.801		NT		ND		NT		ND		NT		ND		ND		0.365	
Benzo(a)anthracene	**1**	**1**	**5.6**	**11**	0.873		**2.28**	J	**3.35**		ND		**1.31**		NT		**2.46**		NT		ND		NT		0.542		NT		ND		ND		0.505	
Benzo(a)pyrene	**1**	**1**	**1**	**1.1**	0.884		**1.78**	J	**2.67**		ND		**1.13**		NT		**1.97**		NT		ND		NT		0.463		NT		ND		ND		0.507	
Benzo(b)fluoranthene	**1**	**1**	**5.6**	**11**	0.721		**1.86**	J	**2.77**		ND		**1.14**		NT		**2.07**		NT		ND		NT		0.504		NT		ND		ND		0.424	
Benzo(ghi)perylene	**100**	**100**	**500**	**1000**	0.514		1.09	J	1.66		ND		0.775		NT		1.25		NT		ND		NT		0.328	J	NT		ND		ND		0.268	J
Benzo(k)fluoranthene	**0.8**	**3.9**	**56**	**110**	**0.818**		**1.19**	J	**1.49**		ND		0.774		NT		**1.09**		NT		ND		NT		0.266	J	NT		ND		ND		0.422	
Carbazole	**--**	**--**	**--**	**--**	ND		0.358	J	0.89		ND		0.364	J	NT		0.249	J	NT		ND		NT		ND		NT		ND		ND		ND	
Chrysene	**1**	**3.9**	**56**	**110**	**1.02**		**2.08**	J	**3.11**		ND		**1.44**		NT		**2.21**		NT		ND		NT		0.463		NT		ND		ND		0.563	
Dibenzo(a,h)anthracene	**0.33**	**0.33**	**0.56**	**1.1**	0.233	J	**0.378**	J	**0.504**	J	ND		0.292	J	NT		**0.361**		NT		ND		NT		ND		NT		ND		ND		ND	
Dibenzofuran	**7**	**59**	**350**	**1000**	ND		ND		0.49	J	ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Fluoranthene	**100**	**100**	**500**	**1000**	2.12		5.15	J	8.57		ND		3.33		NT		5.57		NT		ND		NT		0.915		NT		ND		0.174	J	1.3	
Fluorene	**30**	**100**	**500**	**1000**	ND		0.345	J	0.794		ND		0.216		NT		0.208	J	NT		ND		NT		ND		NT		ND		ND		0.185	J
Indeno(1,2,3-cd)pyrene	**0.5**	**0.5**	**5.6**	**11**	0.329	J	**1.21**	J	**2.02**		ND		0.606		NT		**1.54**		NT		ND		NT		0.409		NT		ND		ND		0.197	J
Naphthalene	**12**	**100**	**500**	**1000**	ND		ND		0.00731	J	ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Phenol	**0.33**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
2-Methylphenol	**0.33**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
3-Methylphenol/4-Methylphenol	**0.33**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Phenanthrene	**100**	**100**	**500**	**1000**	1.55		3.28	J	8.34		ND		2.74		NT		2.72		NT		ND		NT		0.494		NT		0.191	J	ND		1.17	
Pyrene	**100**	**100**	**500**	**1000**	1.99		3.77	J	6.43		ND		2.61		NT		3.93		NT		ND		NT		0.725		NT		0.235	J	0.176	J	1.24	
Total Metals - mg/Kg																																		
Arsenic	**13**	**16**	**16**	**16**	**18.9**		11.1		8.36		4.08		8.58		NT		7.28		NT		3.85		NT		6.51		NT		5.15		3.33		2.57	
Barium	**350**	**400**	**400**	**10000**	287		163	J	81.8	J	9.65	J	132		NT		102	J	NT		7.93	J	NT		85.1	J	NT		70.3		21.7		36.3	
Beryllium	**7.2**	**72**	**590**	**2700**	0.583		0.345		0.308		ND		0.409		NT		0.359		NT		0.143	J	NT		0.453		NT		0.512		0.203	J	0.193	J
Cadmium	**2.5**	**4.3**	**9.3**	**60**	0.900		2.14		2.45		0.393		1.37		NT		1.40		NT		0.484		NT		2.03		NT		0.746		0.539		0.300	
Hex Chromium	**1**	**110**	**400**	**800**	ND		NT		ND		NT		~~ND~~	R	NT		NT		NT		NT		NT		NT		NT		ND		NT		NT	
Chromium	**30**	**180**	**1500**	**6800**	17.8		17.7		13.6		3.27		17.7		NT		17.1		NT		4.08		NT		**472**		10.3		9.56		5.88		5.80	
Copper	**50**	**270**	**270**	**10000**	**280**		~~233~~	J	**141**	J	2.26	J	**59.1**		NT		43.4	J	NT		2.15	J	NT		29.3	J	NT		10.2		8.03		23.6	
Cyanide	**27**	**27**	**27**	**10000**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		0.510	
Lead	**63**	**400**	**1000**	**3900**	**480**		**275**		**178**		5.58		**417**		NT		**285**		NT		5.12		NT		**912**		NT		**100**		29.0		**114**	
Manganese	**1600**	**2000**	**10000**	**10000**	271		328	M	293		116		312		NT		213		NT		176		NT		**8910**		392		278		172		165	
Mercury	**0.18**	**0.81**	**2.8**	**5.7**	**0.239**		~~0.269~~	R	~~0.328~~	R	ND		**0.769**		NT		~~2.05~~	R	NT		ND		NT		~~0.401~~	R	NT		0.00646	J	0.0367		0.0479	
Nickel	**30**	**310**	**310**	**10000**	18.5		14.0		12.0		6.70		21.0		NT		12.9		NT		7.92		NT		16.8		NT		7.73		8.1		6.87	
Selenium	**3.9**	**180**	**1500**	**6800**	1.73		**4.39**		**4.84**		ND		1.99		NT		0.718		NT		0.752		NT		**7.3**		NT		2.77		1.89		ND	
Silver	**2**	**180**	**1500**	**6800**	0.748		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Zinc	**109**	**10000**	**10000**	**10000**	**422**		~~486~~	R	~~502~~	R	~~22.1~~	R	**242**		NT		~~306~~	R	NT		~~23.9~~	R	NT		~~111~~	R	NT		61.6		41.7		99.0	
Polychlorinated biphenyls (PCBs) - mg/Kg 4																																		
Aroclor 1254	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		0.0228	J	NT		ND		ND		ND	
Aroclor 1260	See Total PCBs	See Total PCBs	See Total PCBs	See Total PCBs	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Total PCBs	**0.1**	**1**	**1**	**25**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		0.0228	J	NT		ND		ND		ND	
Pesticides and Herbicides - mg/Kg 4																																		
4,4'-DDE	**0.0033**	**8.9**	**62**	**120**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
4,4'-DDT	**0.0033**	**7.9**	**47**	**94**	ND		ND		ND		ND		0.00258	NJ	NT		**0.00364**	JN	NT		ND		NT		ND		NT		ND		ND		ND	
4,4-DDD	**0.0033**	**13**	**92**	**180**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Aldrin	**0.005**	**0.097**	**0.68**	**1.4**	ND		ND		ND		ND		0.00347	NJ	NT		ND		NT		ND		NT		**0.0061**	JN	NT		ND		ND		ND	
alpha-BHC	**0.02**	**0.48**	**3.4**	**6.8**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
beta-BHC	**0.036**	**0.36**	**3**	**14**	ND		0.00937	J	ND		ND		ND		NT		ND		NT		0.00262	J	NT		ND		NT		ND		ND		ND	
cis-Chlordane	**0.094**	**4.2**	**24**	**47**	ND		ND		0.00278	JN	ND		0.0226		NT		0.0293		NT		ND		NT		ND		NT		ND		ND		0.00507	J
delta-BHC	**0.04**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Dieldrin	**0.005**	**0.2**	**1.4**	**2.8**	0.00436		ND		ND		ND		ND		NT		ND		NT		ND		NT		0.00336		NT		ND		ND		ND	
Endosulfan I	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Endosulfan II	**2.4**	**24**	**200**	**920**	ND		ND		0.00242	J	ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Endosulfan sulfate	**2.4**	**24**	**200**	**920**	ND		0.0199		ND		ND		ND		NT		0.00994		NT		ND		NT		ND		NT		ND		ND		ND	
Endrin	**0.014**	**11**	**89**	**410**	ND		ND		ND		ND		0.00312	NJ	NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Endrin aldehyde	**--**	**--**	**--**	**--**	ND		ND		0.004		ND		0.00559		NT		0.00407		NT		ND		NT		ND		NT		ND		ND		ND	
Endrine ketone	**--**	**--**	**--**	**--**	ND		ND		0.00714	J	ND		ND		NT		0.0114	J	NT		ND		NT		0.00457		NT		ND		ND		0.00238	J
gamma-BHC (Lindane)	**0.1**	**1.3**	**9.2**	**23**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	
Heptachlor epoxide	**--**	**--**	**--**	**--**	ND		ND		0.00252	J	ND		ND		NT		0.00196	J	NT		ND		NT		ND		NT		ND		ND		ND	
Methoxychlor	**--**	**--**	**--**	**--**	ND		0.0638	JN	ND		ND		ND		NT		NT		NT		ND		NT		0.0223	JN	NT		ND		ND		ND	
trans-Chlordane	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		ND		ND	

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
3. Values per NYSDEC Part 375 Table 375-6.8(b) Restricted Soil Cleanup Objectives.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:
ND = Parameter not detected above laboratory detection limit.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased low.
NJ = The detection is tenative in identification and estimated in value.
R = The sample results are rejected due to deficiencies in meeting Quality Control limits. Tha analyte may or may not be present.

Bold	= Result exceeds Unrestricted Use SCOs.
Bold	= Result exceeds Restricted Residential Use SCOs.
Bold	= Result exceeds Commercial Use SCOs.
Bold	= Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4

SUMMARY OF REMEDIAL INVESTIGATION TEST PITS SOIL/FILL SAMPLE ANALYSIS RESULTS

REMEDIAL INVESTIGATION

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	Unrestricted Use SCOs [2]	Restricted Residential Use SCOs [3]	Commercial Use SCOs [3]	Industrial Use SCO's [3]	TP-1-5-6FT	Q	TP-2-6-7FT	Q	TP-3-6-7FT	Q	TP-4-6-7FT	Q	TP-6-5-6FT	Q	TP-7-6-7FT	Q
Volatile Organic Compounds (VOCs) - mg/Kg [4]																
Acetone	**0.05**	**100**	**500**	**1000**	~~0.069~~	R	~~0.0359~~	R	~~0.0222~~	R	ND	R	~~0.266~~	R	~~0.0157~~	R
Carbon disulfide	**--**	**--**	**--**	**--**	ND	R	ND	R	ND	R	~~0.00567~~	R	~~0.0148~~	R	ND	R
Naphthalene	**12**	**100**	**500**	**1000**	ND	R	ND	R	ND	R	ND	R	~~0.208~~	R	ND	R
2-Butanone (MEK)	**0.12**	**100**	**500**	**1000**	ND	R	ND	R	ND	R	ND	R	~~0.0622~~	R	ND	R
Semi-Volatile Organic Compounds (SVOCs) - mg/Kg [4]																
2-Methylnaphthalene	**--**	**--**	**--**	**--**	ND		ND		ND		0.348	J	ND		ND	
2,4-Dinitrotoluene	**--**	**--**	**--**	**--**	ND		ND		ND		ND		0.203	J	ND	
Acenaphthene	**20**	**100**	**500**	**1000**	ND		ND		ND		ND		0.223	J	ND	
Anthracene	**100**	**100**	**500**	**1000**	ND		ND		0.291	J	0.285	J	0.851		ND	
Benzo(a)anthracene	**1**	**1**	**5.6**	**11**	ND		0.228	J	0.466		**1.03**		**2.13**		ND	
Benzo(a)pyrene	**1**	**1**	**1**	**1.1**	ND		0.261	J	0.361		0.794		**1.78**		ND	
Benzo(b)fluoranthene	**1**	**1**	**5.6**	**11**	ND		0.371		0.31	J	0.82		**1.51**		ND	
Benzo(ghi)perylene	**100**	**100**	**500**	**1000**	ND		0.696		0.228	J	0.511		1.08		ND	
Benzo(k)fluoranthene	**0.8**	**3.9**	**56**	**110**	ND		0.238	J	0.315	J	0.594		**1.46**		ND	
Carbazole	**--**	**--**	**--**	**--**	ND		ND		ND		ND		0.303	J	ND	
Chrysene	**1**	**3.9**	**56**	**110**	ND		0.221	J	0.469		**1.02**		**2.02**		ND	
Dibenzo(a,h)anthracene	**0.33**	**0.33**	**0.56**	**1.1**	ND		ND		ND		0.223	J	**0.44**		ND	
Dibenzofuran	**7**	**59**	**350**	**1000**	ND		ND		ND		ND		0.192	J	ND	
Fluoranthene	**100**	**100**	**500**	**1000**	0.222	J-	0.352	J	1.03		1.79		4.52		ND	
Fluorene	**30**	**100**	**500**	**1000**	ND		ND		ND		ND		0.338	J	ND	
Indeno(1,2,3-cd)pyrene	**0.5**	**0.5**	**5.6**	**11**	ND		0.33	J	ND		0.387		**0.756**		ND	
Naphthalene	**12**	**100**	**500**	**1000**	ND		ND		ND		0.289	J	0.208	J	ND	
Phenanthrene	**100**	**100**	**500**	**1000**	ND		0.222	J	0.926		1.42		2.96		ND	
Pyrene	**100**	**100**	**500**	**1000**	0.192	J-	0.33	J	0.33		1.41		3.52		ND	
Total Metals - mg/Kg																
Arsenic	**13**	**16**	**16**	**16**	3.9		9.66		4.58		9.33		10.7		2.24	
Barium	**350**	**400**	**400**	**10000**	73.4		57		85.6		93.8		103		73	
Beryllium	**7.2**	**72**	**590**	**2700**	0.422		0.476		0.496		0.38		0.472		0.202	J
Cadmium	**2.5**	**4.3**	**9.3**	**60**	0.659		0.717		0.865		**2.96**		2.25		0.333	
Hex Chromium	**1**	**110**	**400**	**800**	NT		NT		ND		NT		NT		NT	
Chromium	**30**	**180**	**1500**	**6800**	13.2		12.3		13.7		**65.1**		22		6.57	
Copper	**50**	**270**	**270**	**10000**	28.2		23.6		48		**110**		**76.7**		11.9	
Cyanide	**27**	**27**	**27**	**10000**	NT		NT		NT		NT		NT		NT	
Lead	**63**	**400**	**1000**	**3900**	**70**		37.4		**190**		**371**		**261**		61.5	
Manganese	**1600**	**2000**	**10000**	**10000**	240		346		320		192		296	M	203	
Mercury	**0.18**	**0.81**	**2.8**	**5.7**	0.141		**1.44**		ND		**0.404**		**0.829**	D	0.162	
Nickel	**30**	**310**	**310**	**10000**	19.6		20.4		14.6		16.1		20.3		5.61	
Selenium	**3.9**	**180**	**1500**	**6800**	1.4		1.24		1.14		1.52		2.16	J	1.53	
Silver	**2**	**180**	**1500**	**6800**	ND		ND		ND		ND		ND		ND	
Zinc	**109**	**10000**	**10000**	**10000**	**111**		81.9		**1200**		**221**		**280**		92.9	
Polychlorinated biphenyls (PCBs) - mg/Kg [4]																
Total PCBs	**0.1**	**1**	**1**	**25**	ND		ND		ND		ND		ND		ND	
Pesticides and Herbicides - mg/Kg [4]																
4,4'-DDE	**0.0033**	**8.9**	**62**	**120**	ND		ND		ND		ND		ND		ND	
4,4'-DDT	**0.0033**	**7.9**	**47**	**94**	ND		ND		ND		**0.0247**		**0.00744**	J	ND	
4,4-DDD	**0.0033**	**13**	**92**	**180**	ND		ND		ND		ND		**0.047**	J	ND	
Aldrin	**0.005**	**0.097**	**0.68**	**1.4**	ND		ND		ND		ND		ND		ND	
alpha-BHC	**0.02**	**0.48**	**3.4**	**6.8**	ND		ND		ND		ND		ND		ND	
beta-BHC	**0.036**	**0.36**	**3**	**14**	ND		ND		ND		ND		ND		ND	
cis-Chlordane	**0.094**	**4.2**	**24**	**47**	ND		ND		ND		ND		ND		ND	
delta-BHC	**0.04**	**100**	**500**	**1000**	ND		ND		ND		ND		ND		ND	
Dieldrin	**0.005**	**0.2**	**1.4**	**2.8**	ND		ND		ND		ND		ND		ND	
Endosulfan I	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		ND	
Endosulfan II	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		ND		ND	
Endosulfan sulfate	**2.4**	**24**	**200**	**920**	ND		ND		ND		ND		0.0119	J	ND	
Endrin	**0.014**	**11**	**89**	**410**	ND		ND		ND		ND		ND		ND	
Endrin aldehyde	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND	
Endrine ketone	**--**	**--**	**--**	**--**	ND		ND		ND		ND		0.00591	P	ND	
gamma-BHC (Lindane)	**0.1**	**1.3**	**9.2**	**23**	ND		ND		ND		ND		ND		0.00198	NJ
Heptachlor	**0.042**	**2.1**	**15**	**29**	ND		ND		ND		ND		ND		ND	
Heptachlor epoxide	**--**	**--**	**--**	**--**	ND		ND		ND		0.00329	J	ND		ND	
Methoxychlor	**--**	**--**	**--**	**--**	0.00683	NJ	0.00993	J	0.0045	J	0.0164		ND		ND	
trans-Chlordane	**--**	**--**	**--**	**--**	ND		ND		ND		ND		ND		ND	

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 Part 375 Table 375-6.8(a) Unrestricted Soil Cleanup Objectives.
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4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

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Bold	= Result exceeds Industrial use SCO's.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 5

SUMMARY OF REMEDIAL INVESTIGATION GROUNDWATER SAMPLE ANALYSIS RESULTS

REMEDIAL INVESTIGATION

QUEEN CITY LANDING SITE
BUFFALO, NEW YORK

PARAMETER [1]	GWQS [2]	MW-1		MW-1		MW-2		MW-2		MW-3		MW-3		MW-4		BLIND DUP (MW-4)		MW-4		MW-5		MW-5		MW-6		MW-6		MW-7		MW-7		MW-8		MW-8		MW-9	
		2/7/2017		3/30/2016		2/7/2017		3/30/2016		2/7/2017		3/30/2016		2/7/2017		2/7/2017		3/31/2016		2/7/2017		3/30/2016		2/7/2017		3/30/2016		2/7/2017		3/30/2016		2/7/2017		3/30/2016		2/7/2017	
Volatile Organic Compounds (VOCs) - ug/l																																			
2-Butanone (MEK)	**50**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		6.6	
Acetone	**50**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		3 J	J	ND		1.7	J	ND		2.6	J	ND		**52**	
Benzene	**1**	**4.2**		**1.95**		ND		ND		0.36	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Cyclohexane	**--**	ND		ND		ND		ND		7.5	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Dichlorodifluoromethane (Freon-12)	**5**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		**10**	
Methyl acetate	**--**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Methyl tert butyl ether (MTBE)	**10**	0.95	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		**39**		**20.7**		0.93	J	3.97		0.88	J
Methylcyclohexane	**--**	ND		ND		ND		ND		0.69	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Naphthalene	**10**	ND		6.04		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		4.56	J	ND		**29.5**		ND		ND		ND	
Semi-Volatile Organic Compounds (SVOCs) - ug/l																																			
Acenaphthene	**20**	0.99		ND		0.11		ND		2.2		ND		0.35		0.25		ND		0.18		ND		0.3		ND		9.3		ND		0.37		ND		0.07	J
Acenaphthylene	**--**	0.07	J	ND		0.06	J	ND		0.07	J	ND		0.05	J	0.05	J	ND		ND		ND		ND		ND		0.22		ND		ND		ND		ND	
Anthracene	**50**	0.17	J	ND		0.05	J	ND		0.07	J	ND		0.2		0.16 J	J	ND		ND		ND		0.09	J	ND		1.1		ND		0.08	J	ND		0.04	J
Benzo(a)anthracene	**0.002**	**0.1**	J	ND		**0.06**	J	ND		**0.04**	J	ND		**0.12**	J	**0.07**	J	ND		**0.03**	J	ND		**0.03**	J	ND		**0.07**	J	ND		**0.03**	J	ND		ND	
Benzo(a)pyrene	**MDL**	**0.08**	J	ND		**0.05**	J	ND		ND		ND		**0.1**	J	**0.06**	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Benzo(b)fluoranthene	**0.002**	**0.12**	J	ND		**0.07**	J	ND		**0.04**	J	ND		**0.13**	J	**0.07**	J	ND		**0.03**	J	ND		ND		ND		**0.05**	J	ND		**0.03**		ND		ND	
Benzo(ghi)perylene	**--**	0.07	J	ND		ND		ND		ND		ND		0.08	J	0.04	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Benzo(k)fluoranthene	**0.002**	0.04	J	ND		ND		ND		ND		ND		0.05	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Chrysene	**0.002**	0.11	J	ND		0.06	J	ND		ND		ND		0.12	J	0.07	J	ND		ND		ND		ND		ND		0.07	J	ND		ND		ND		ND	
Fluoranthene	**50**	0.39		ND		0.16	J	ND		0.12	J	ND		0.48		0.29		ND		0.08	J	ND		0.17	J	ND		2.1		ND		0.13	J	ND		ND	
Fluorene	**50**	0.94		ND		0.1	J	ND		0.14	J	ND		0.3		0.18	J	ND		0.16	J	ND		0.1	J	ND		6.9		ND		0.31		ND		0.06	J
Indeno(1,2,3-cd)pyrene	**0.002**	0.07	J	ND		0.04	J	ND		ND		ND		0.08	J	0.04	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
2-Methylnapthalene	**--**	0.81		ND		0.12	J	ND		ND		ND		0.13	J	0.15	J	ND		ND		ND		ND		ND		0.13	J	ND		ND		ND		0.09	J
Naphthalene	**10**	5.8		ND		0.66		ND		0.06	J	ND		0.39		0.27		ND		0.05	J	ND		0.19	J	ND		1.9		ND		0.11	J	ND		ND	
Phenanthrene	**50**	1.4		ND		0.19	J	ND		0.15	J	ND		1		0.72		ND		0.14	J	ND		0.18	J	ND		7		ND		0.36		ND		0.11	J
Pyrene	**50**	0.29		ND		0.16	J	ND		0.14	J	ND		0.37		0.24		ND		0.06	J	ND		0.2		ND		1.3		ND		0.1	J	ND		ND	
Total Metals - ug/l																																			
Aluminum	**--**	278		NT		466		NT		686		NT		133		136		NT		194		NT		51.4		NT		782		NT		498		NT		547	
Antimony	**3**	ND		NT		ND		NT		ND		NT		ND		ND		NT		ND		NT		ND		NT		ND		NT		ND		NT		ND	
Arsenic	**25**	4.11		ND		3.31		ND		6.89		ND		2.46		1.89		ND		5.7		ND		1.53		ND		1.34		16.8	J-	9.61		ND		7.31	
Barium	**1000**	395.8		270	J-	78.48		111	J-	152.2		129		123.3		119.8		138		179.2		114	J-	53.12		55.2	J-	36.1		ND		79.49		54.4	J	70.04	
Cadmium	**5**	0.09	J	ND		ND		ND		0.09	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Calcium	**--**	149000		NT		144000		NT		145000		NT		132000		134000		NT		240000		NT		64300		NT		51200		NT		191000		NT		82000	
Hexavalent Chromium	**50**	NT		NT		ND		NT		NT		NT		NT		NT		NT		NT		NT		ND		NT		NT		NT		NT		NT		NT	
Chromium	**50**	1.66		ND		1		ND		1.52		ND		0.38	J	0.43	J	ND		0.59	J	ND		0.38	J	ND		1.48		ND		1.61		ND		1.49	
Cobalt	**--**	0.31	J	NT		0.58		NT		0.75		NT		0.43	J	0.41	J	NT		1.16		NT		ND		NT		0.71		NT		2.21		NT		0.7	
Copper	**200**	8.07		16.2	J-	3.15		ND		4.93		ND		12.95		11.66		ND		1.94		ND		0.51		ND		2.77		ND		2.46		ND		4.68	
Iron	**300**	**8800**		NT		**1440**		NT		**3670**		NT		**2340**		**2260**		NT		**6990**		NT		268		NT		**1370**		NT		**3060**		NT		**1360**	
Cyanide	**200**	3	J	NT		5		NT		4	J	NT		ND		ND		NT		ND		NT		5		NT		3	J	NT		2	J	ND		4	J
Lead	**25**	17.85		18.4	J-	21.87		**25.7**	J-	10.97		ND		11.6		11.66		**41.9**		3.9		ND		0.58	J	7.21	J-	9.47		20.4	J-	3.92		ND		3.35	
Magnesium	**35000**	**48300**		NT		28600		NT		32100		NT		25600		28500		NT		**35600**		NT		9150		NT		15400		NT		**97800**		NT		20100	
Manganese	**300**	253		**625**	J-	214.5		**318**	J-	244.1		296		**385.5**		**397.1**		**318**		**1107**		**870**	J-	127.2		131	J-	51.39		51	J-	**1382**		210		85.4	
Nickel	**100**	2.21		ND		1.68	J	ND		3.07		ND		1.41	J	1.01	J	ND		3.28		ND		1.1	J	ND		2.56		ND		4.84		ND		6.35	
Potassium	**--**	11600		NT		6730		NT		6770		NT		4270		4360		NT		11800		NT		6880		NT		9720		NT		7870		NT		22600	
Selenium	**10**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		4.08	J
Sodium	**20000**	**49800**		NT		13000		NT		**103000**		NT		**24600**		**25300**		NT		**350000**		NT		**254000**		NT		**74300**		NT		**41600**		NT		**128000**	
Vanadium	**--**	ND		NT		ND		NT		3.32	J	NT		ND		ND		NT		ND		NT		2.24	J	NT		2.9	J	NT		ND		NT		3.44	J
Zinc	**2000**	22.63		50.9	J-	14.92		40.5	J-	19.32		ND		8.85	J	8.53	J	55.1	J	10.81		ND		ND		ND		14.23		ND		10.25		ND		7.1	J
Polychlorinated biphenyls (PCBs) - ug/l																																			
Total PCBs		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Pesticides and Herbicides - ug/l																																			
		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	

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 Division of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)

Definitions:

ND = Parameter not detected above laboratory detection limit.
NT = Parameter was not analyzed for.
"--" = No value available for the parameter; Parameter not analysed for.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
J+ = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased high.
J- = Analyte was positively identifed; the associated numerical value is an estimated quantity that may be biased low.
Bold = Result exceeds GWQS.

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TABLE 6

ALTERNATIVE 2: COST ESTIMATE FOR UNRESTRICTED USE (TRACK 1) CLEANUP

Alternatives Analysis Report
Queen City Landing Site
Buffalo, New York

Item	Quantity	Units	Unit Cost	Total Cost
Impacted Soil/Fill Removal[1]				
Clearing & Grubbing	7.72	ACRE	$ 4,000	$ 30,880
Concrete Pile Removal & Disposal [2]	8,000	TON	$ 25	$ 200,000
Concrete Pile Removal & Recycling [2]	24,000	TON	$ 7	$ 168,000
Soil/Fill Excavation (15 fbgs)	186,824	CY	$ 20	$ 3,736,480
Transportation & Disposal at TSDF (non-haz)	298,918	TON [3]	$ 40	$ 11,956,736
Dewatering Excavation (Frac tank, pumps, hoses)	150	DAY	$ 500	$ 75,000
Water Treatment prior to discharge to sewer	1	EST	$ 50,000	$ 50,000
Decon Frac Tank (inc. mob/demob and decon)	1	EST	$ 10,000	$ 10,000
Verification Sampling (VOCs, SVOC, Metals, PCBs)	400	EST	$ 485	$ 194,000
Subtotal:				**$ 16,421,096**
UST and Piping Removal				
Remove, clean and recycle UST off-site	1	LS	$ 10,000	$ 10,000
Remove, clean and recycle piping off-site	150	LF	$ 30	$ 4,500
Subtotal:				**$ 14,500**
Site Restoration				
Part 375 [4] Compliant Backfill, Place & Compact	288,954	TON	$ 25	$ 7,223,861
6" Topsoil	6,227	CY	$ 30	$ 186,824
Seeding	7.72	ACRE	$ 3,000	$ 23,160
Subtotal:				**$ 7,433,845**
Reporting				
Remedial Action Work Plan	1	LS	$ 12,000	$ 12,000
Final Engineering Report	1	LS	$ 15,000	$ 15,000
Subtotal:				**$ 27,000**
Subtotal Capital Cost				**$ 23,896,441**
Contractor Mobilization/Demobilization				$ 200,000
Health and Safety/Air Monitoring				$ 50,000
Engineering/Contingency (5%)				$ 1,194,822
Estimated Remedial Cost				**$ 25,400,000**

Notes:

1. Entire 7.72-acre Site assumed to be non-hazardous..
2. Assumes concrete pile volume is 16,000 cubic yards; 2 tons per cubic yards; and 25% of pile is less than 1/2 inch in size and will require landfill disposa
2. Estimated 1.6 tons per cubic yard
3. Per 6NYCRR 375-6.7(d)(ii)(b)

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TABLE 7

ALTERNATIVE 3: COST ESTIMATE FOR RESTRICTED-RESIDENTIAL USE (TRACK 4) CLEANUP

Alternatives Analysis Report
Queen City Landing Site
Buffalo, New York

Item	Quantity	Units	Unit Cost	Total Cost
Institutional Controls				
Develop Site Management Plan, Easement, Survey	1	LS	$ 30,000	$ 30,000
Subtotal:				**$ 30,000**
Impacted Soil/Fill Removal[1]				
Site Mobilization	1	LS	$ 1,000	$ 1,000
Soil/Fill Excavation at 3 locations [4]	480	CY	$ 10	$ 4,800
Transportation & Disposal at TSDF (non-haz)	768	TON[2]	$ 40	$ 30,720
Dewatering Excavation (Frac tank, pumps, hoses)	5	DAY	$ 500	$ 2,500
Water Treatment with Carbon prior to discharge to sewer	1	EST	$ 5,000	$ 5,000
Decon Frac Tank (inc. mob/demob and decon)	1	EST	$ 5,000	$ 5,000
Verification Sampling (VOC, SVOCs-BN, 48-hr TAT)	15	EACH	$ 500	$ 7,500
Subtotal:				**$ 56,520**
Perimeter Soil/Fill Removal				
Soil/Fill Excavation	8,900	CY	$ 10	$ 89,000
Transportation & Disposal at TSDF (non-haz)	14,240	TON[2]	$ 40	$ 569,600
Erosion/Sediment Control	1	LS	$ 10,000	$ 10,000
Subtotal:				**$ 668,600**
Soil Cover System				
Clearing & Grubbing	7.72	ACRE	$ 4,000	$ 30,880
Site Regrading and Survey	10	DAY	$ 2,500	$ 25,000
Demarcation Layer	336,283	SF	$ 0.50	$ 168,142
Part 375 [3] Compliant Backfill, Place & Compact	44,384	TON	$ 25	$ 1,109,600
6" Topsoil	6,227	CY	$ 30	$ 186,824
Seeding	7.72	ACRES	$ 3,000	$ 23,160
Subtotal:				**$ 1,543,606**
Reporting				
Remedial Action Work Plan	1	LS	$ 12,000	$ 12,000
Final Engineering Report	1	LS	$ 15,000	$ 15,000
Subtotal:				**$ 27,000**
Subtotal Capital Cost				**$ 2,340,226**
Contractor Mobilization/Demobilization (5%)				$ 117,011
Health and Safety (2%)				$ 46,805
Engineering/Contingency				$ 150,000
Total Capital Cost				**$ 2,654,041**
Annual Operation Maintenance & Monitoring (OM&M):				
Site Maintenance and Mowing	2	EVENT	$ 2,500	$ 5,000
Annual Certification	1	LS	$ 3,000	$ 3,000
Total Annual OM&M Cost				**$ 8,000**
Number of Years (n):				30
Interest Rate (i):				3%
P/A value:				19.6004
OM&M Present Worth (PW):				**$ 156,803**
Total Present Worth (PW): Capital Cost + OM&M PW				**$ 2,811,000**

Notes:

1. Impacted areas estimated based in additional investigation activities completed.
2. Estimated 1.6 tons per cubic yard
3. Per 6NYCRR 375-6.7(d)(ii)(b); assumes 1.5 feet of cover over entire Site minus the backfill placed in the excavated areas.
4. Three (3) areas to be addressed include Boundary-SS2, soil/fill stockpile at F6, and petroleum-impacts at D7.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 8

COMPARISON OF REMEDIAL ALTERNATIVES

Alternatives Analysis Report
Queen City Landing Site
Buffalo, New York

Site No. and 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							$0	TBE	
Alternative 2 - Track 1 Cleanup	✓	✓	✓	✓			$25.4 million	TBE	✓
Alternative 3 - Track 4 Cleanup	✓	✓	✓	✓	✓	✓	$2.8 million	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

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 1; Site Location and Vicinity Map.dwg, DWG To PDF.pc3

FIGURE 1

N

2,500' 0' 2,500' 5,000'

SCALE: 1 INCH = 2,500 FEET
SCALE IN FEET
(approximate)

LEGEND:

BCP SITE BOUNDARY

*BASEMAP ADAPTED FROM BING MAPS

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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

PROJECT NO.: 0424-017-001

DATE: OCTOBER 2017

DRAFTED BY: RFL

SITE LOCATION AND VICINITY MAP

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BCP SITE NO. 915304
BUFFALO, NEW YORK

PREPARED FOR

QUEEN CITY LANDING, LLC

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 2; Site Map.dwg, DWG To PDF.pc3

LEGEND:

BCP SITE BOUNDARY

NOTES:
1. AERIAL IMAGE FROM GOOGLE EARTH PRO 2017.

N

150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

DATE: OCTOBER 2017
DRAFTED BY: RFL

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

JOB NO.: 0424-017-001

SITE PLAN (AERIAL PHOTOGRAPH)

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK

PREPARED FOR
QUEEN CITY LANDING, LLC

FIGURE 2

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 3; SS RRSCO Exceedances - Organics.dwg

LEGEND:

BCP SITE BOUNDARY

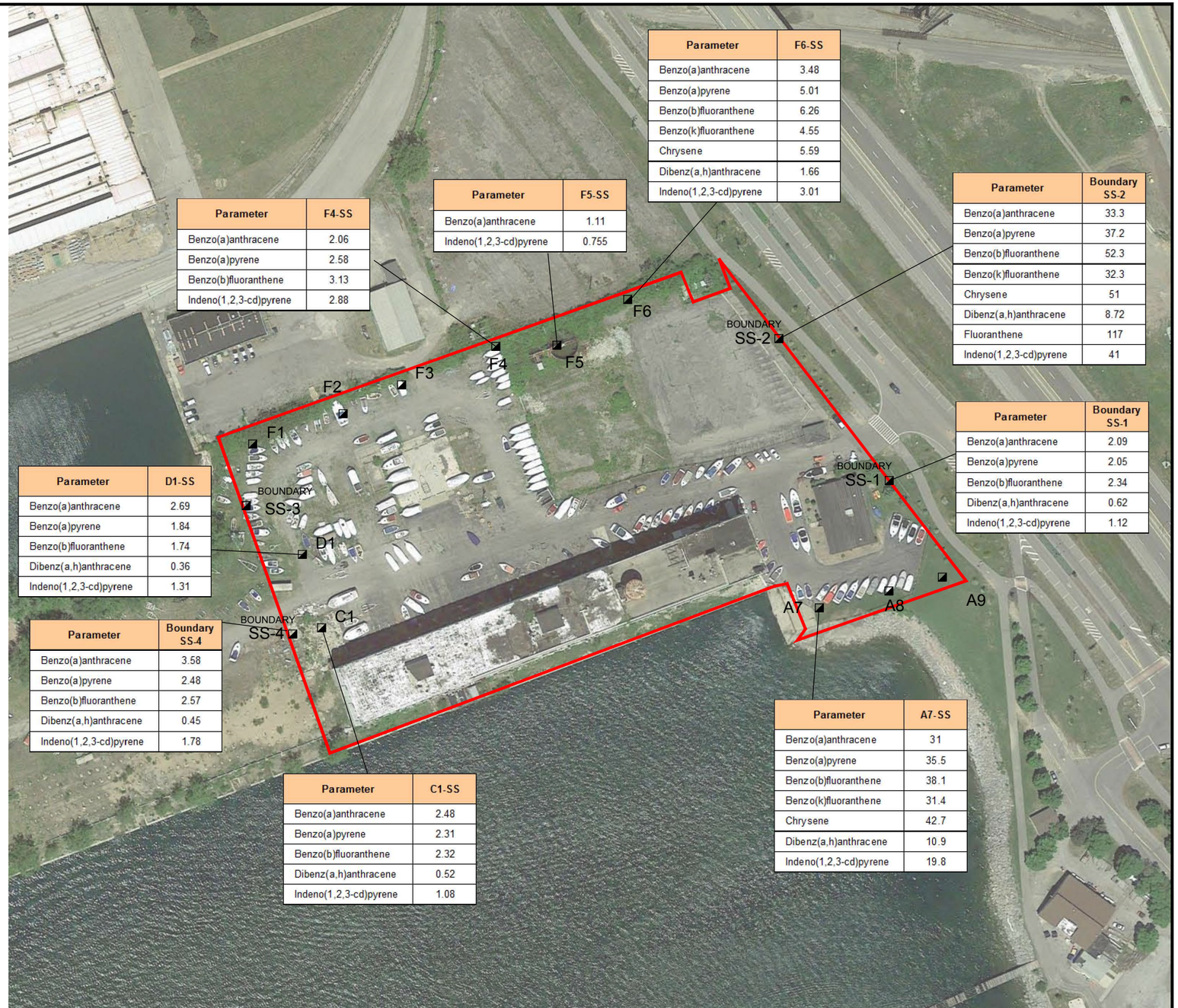
F2 ◪
BOUNDARY
SS-1 ◪

SURFACE SOIL SAMPLES

Parameter	F5-SS
Benzo(a)anthracene	1.11
Indeno(1,2,3-cd)pyrene	0.755

ANALYTE DETECTED — CONCENTRATION DETECTED (mg/kg)

NOTES:
1. MG/KG = MILLIGRAMS PER KILOGRAM.
2. RRSCO = RESTRICTED-RESIDENTIAL SOIL CLEANUP OBJECTIVE.
3. SS= SURFACE SOIL SAMPLE.
4. AERIAL IMAGE FROM GOOGLE EARTH PHOTOGRAPHY 2015.



Parameter	F4-SS
Benzo(a)anthracene	2.06
Benzo(a)pyrene	2.58
Benzo(b)fluoranthene	3.13
Indeno(1,2,3-cd)pyrene	2.88

Parameter	F5-SS
Benzo(a)anthracene	1.11
Indeno(1,2,3-cd)pyrene	0.755

Parameter	F6-SS
Benzo(a)anthracene	3.48
Benzo(a)pyrene	5.01
Benzo(b)fluoranthene	6.26
Benzo(k)fluoranthene	4.55
Chrysene	5.59
Dibenz(a,h)anthracene	1.66
Indeno(1,2,3-cd)pyrene	3.01

Parameter	Boundary SS-2
Benzo(a)anthracene	33.3
Benzo(a)pyrene	37.2
Benzo(b)fluoranthene	52.3
Benzo(k)fluoranthene	32.3
Chrysene	51
Dibenz(a,h)anthracene	8.72
Fluoranthene	117
Indeno(1,2,3-cd)pyrene	41

Parameter	Boundary SS-1
Benzo(a)anthracene	2.09
Benzo(a)pyrene	2.05
Benzo(b)fluoranthene	2.34
Dibenz(a,h)anthracene	0.62
Indeno(1,2,3-cd)pyrene	1.12

Parameter	D1-SS
Benzo(a)anthracene	2.69
Benzo(a)pyrene	1.84
Benzo(b)fluoranthene	1.74
Dibenz(a,h)anthracene	0.36
Indeno(1,2,3-cd)pyrene	1.31

Parameter	Boundary SS-4
Benzo(a)anthracene	3.58
Benzo(a)pyrene	2.48
Benzo(b)fluoranthene	2.57
Dibenz(a,h)anthracene	0.45
Indeno(1,2,3-cd)pyrene	1.78

Parameter	C1-SS
Benzo(a)anthracene	2.48
Benzo(a)pyrene	2.31
Benzo(b)fluoranthene	2.32
Dibenz(a,h)anthracene	0.52
Indeno(1,2,3-cd)pyrene	1.08

Parameter	A7-SS
Benzo(a)anthracene	31
Benzo(a)pyrene	35.5
Benzo(b)fluoranthene	38.1
Benzo(k)fluoranthene	31.4
Chrysene	42.7
Dibenz(a,h)anthracene	10.9
Indeno(1,2,3-cd)pyrene	19.8

N

150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

DATE: AUGUST 2017
DRAFTED BY: RFL

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

JOB NO.: 0424-017-001

RRSCO EXCEEDANCES IN SURFACE SOILS SVOCs

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK

PREPARED FOR
QUEEN CITY LANDING

FIGURE 3

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 4; SS RRSCO Exceedances - Metals.dwg

LEGEND:

BCP SITE BOUNDARY

F-2 ◪
BOUNDARY
SS-4 ◪

SURFACE SOIL SAMPLES

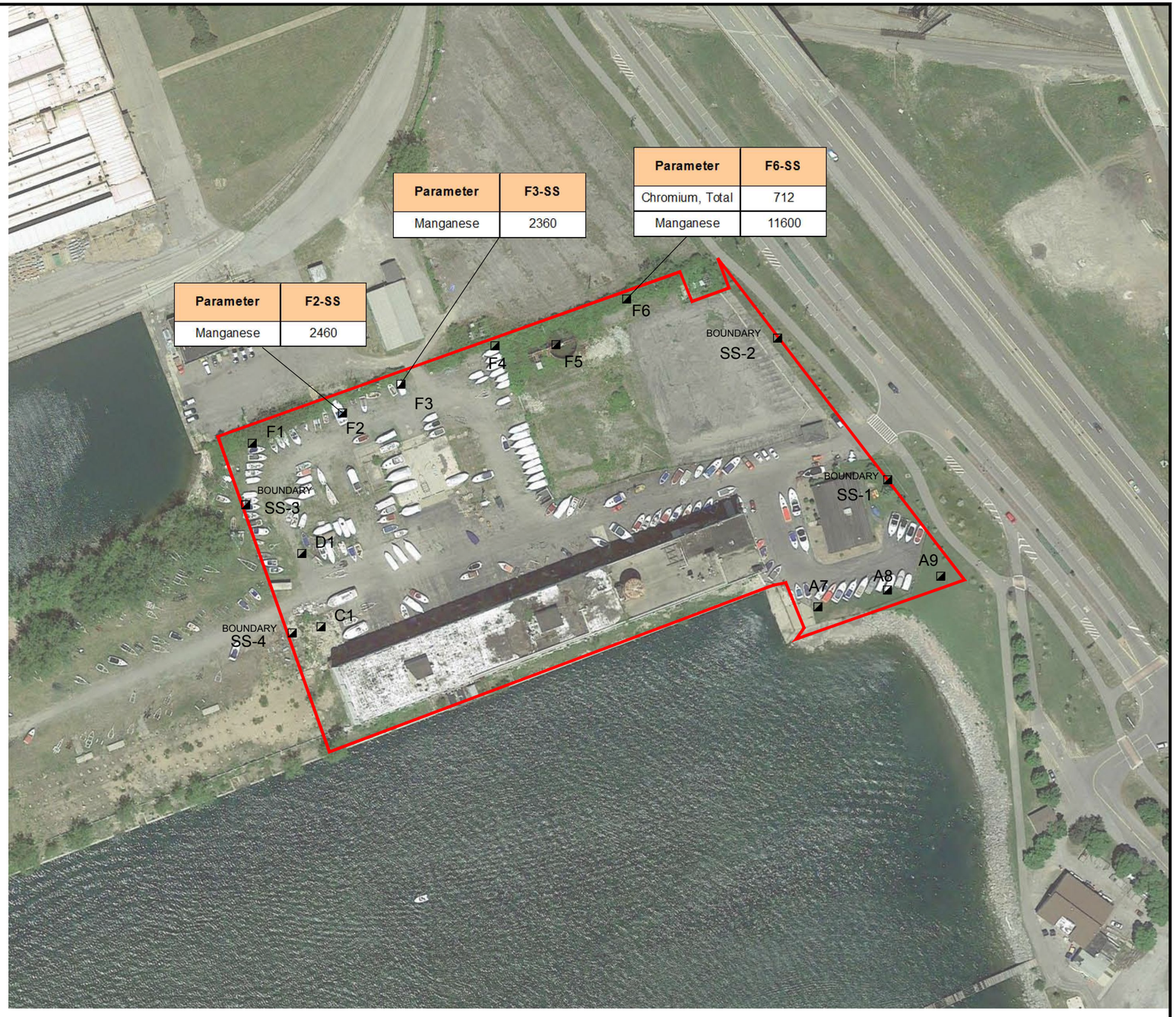
SAMPLE LOCATION AND DEPTH

Parameter	F2-SS
Manganese	2460

ANALYTE DETECTED

CONCENTRATION DETECTED (mg/kg)

NOTES:
1. MG/KG = MILLIGRAMS PER KILOGRAM.
2. RRSCO = RESTRICTED-RESIDENTIAL SOIL CLEANUP OBJECTIVE.
3. NE = RRSCO NOT EXCEEDED
4. AERIAL IMAGE FROM GOOGLE EARTH PHOTOGRAPHY 2015.



N

150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

DATE: AUGUST 2017
DRAFTED BY: RFL

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RRSCO EXCEEDANCES IN SURFACE SOILS METALS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK

PREPARED FOR
QUEEN CITY LANDING

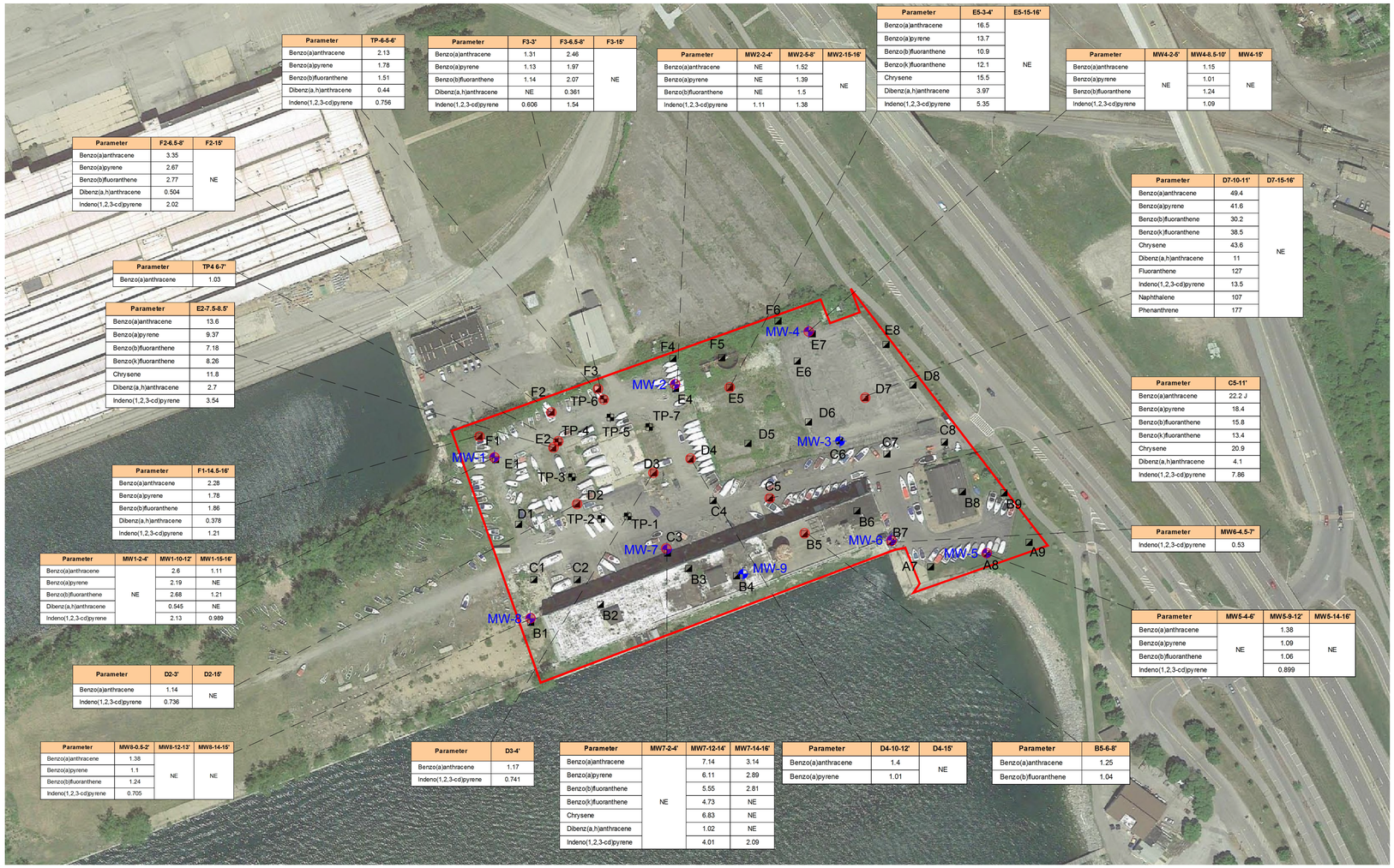
FIGURE 4

F:\CAD\Benchmark\Queen City Landing\VAR\Figure 5 Subsurface Soil RRSCO Exceedances - Organics.dwg

N

100' 0' 100' 200'

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



Parameter	TP-6-5-6'
Benzo(a)anthracene	2.13
Benzo(a)pyrene	1.78
Benzo(b)fluoranthene	1.51
Dibenz(a,h)anthracene	0.44
Indeno(1,2,3-cd)pyrene	0.756

Parameter	F3-3'	F3-6.5-8'	F3-15'
Benzo(a)anthracene	1.31	2.46	NE
Benzo(a)pyrene	1.13	1.97	
Benzo(b)fluoranthene	1.14	2.07	
Dibenz(a,h)anthracene	NE	0.361	
Indeno(1,2,3-cd)pyrene	0.606	1.54	

Parameter	MW2-2-4'	MW2-5-8'	MW2-15-16'
Benzo(a)anthracene	NE	1.52	NE
Benzo(a)pyrene	NE	1.39	
Benzo(b)fluoranthene	NE	1.5	
Indeno(1,2,3-cd)pyrene	1.11	1.38	

Parameter	E5-3-4'	E5-15-16'
Benzo(a)anthracene	16.5	NE
Benzo(a)pyrene	13.7	
Benzo(b)fluoranthene	10.9	
Benzo(k)fluoranthene	12.1	
Chrysene	15.5	
Dibenz(a,h)anthracene	3.97	
Indeno(1,2,3-cd)pyrene	5.35	

Parameter	MW4-2-5'	MW4-8.5-10'	MW4-15'
Benzo(a)anthracene	NE	1.15	NE
Benzo(a)pyrene		1.01	
Benzo(b)fluoranthene		1.24	
Indeno(1,2,3-cd)pyrene		1.09	

Parameter	F2-6.5-8'	F2-15'
Benzo(a)anthracene	3.35	NE
Benzo(a)pyrene	2.67	
Benzo(b)fluoranthene	2.77	
Dibenz(a,h)anthracene	0.504	
Indeno(1,2,3-cd)pyrene	2.02	

Parameter	TP4 6-7'
Benzo(a)anthracene	1.03

Parameter	E2-7.5-8.5'
Benzo(a)anthracene	13.6
Benzo(a)pyrene	9.37
Benzo(b)fluoranthene	7.18
Benzo(k)fluoranthene	8.26
Chrysene	11.8
Dibenz(a,h)anthracene	2.7
Indeno(1,2,3-cd)pyrene	3.54

Parameter	D7-10-11'	D7-15-16'
Benzo(a)anthracene	49.4	NE
Benzo(a)pyrene	41.6	
Benzo(b)fluoranthene	30.2	
Benzo(k)fluoranthene	38.5	
Chrysene	43.6	
Dibenz(a,h)anthracene	11	
Fluoranthene	127	
Indeno(1,2,3-cd)pyrene	13.5	
Naphthalene	107	
Phenanthrene	177	

Parameter	C5-11'
Benzo(a)anthracene	22.2 J
Benzo(a)pyrene	18.4
Benzo(b)fluoranthene	15.8
Benzo(k)fluoranthene	13.4
Chrysene	20.9
Dibenz(a,h)anthracene	4.1
Indeno(1,2,3-cd)pyrene	7.86

Parameter	F1-14.5-16'
Benzo(a)anthracene	2.28
Benzo(a)pyrene	1.78
Benzo(b)fluoranthene	1.86
Dibenz(a,h)anthracene	0.378
Indeno(1,2,3-cd)pyrene	1.21

Parameter	MW6-4.5-7'
Indeno(1,2,3-cd)pyrene	0.53

Parameter	MW1-2-4'	MW1-10-12'	MW1-15-16'
Benzo(a)anthracene	NE	2.6	1.11
Benzo(a)pyrene		2.19	NE
Benzo(b)fluoranthene		2.68	1.21
Dibenz(a,h)anthracene		0.545	NE
Indeno(1,2,3-cd)pyrene		2.13	0.989

Parameter	MW5-4-6'	MW5-9-12'	MW5-14-16'
Benzo(a)anthracene	NE	1.38	NE
Benzo(a)pyrene		1.09	
Benzo(b)fluoranthene		1.06	
Indeno(1,2,3-cd)pyrene		0.899	

Parameter	D2-3'	D2-15'
Benzo(a)anthracene	1.14	NE
Indeno(1,2,3-cd)pyrene	0.736	

Parameter	MW8-0.5-2'	MW8-12-13'	MW8-14-15'
Benzo(a)anthracene	1.38	NE	NE
Benzo(a)pyrene	1.1		
Benzo(b)fluoranthene	1.24		
Indeno(1,2,3-cd)pyrene	0.705		

Parameter	D3-4'
Benzo(a)anthracene	1.17
Indeno(1,2,3-cd)pyrene	0.741

Parameter	MW7-2-4'	MW7-12-14'	MW7-14-16'
Benzo(a)anthracene	NE	7.14	3.14
Benzo(a)pyrene		6.11	2.89
Benzo(b)fluoranthene		5.55	2.81
Benzo(k)fluoranthene		4.73	NE
Chrysene		6.83	NE
Dibenz(a,h)anthracene		1.02	NE
Indeno(1,2,3-cd)pyrene		4.01	2.09

Parameter	D4-10-12'	D4-15'
Benzo(a)anthracene	1.4	NE
Benzo(a)pyrene	1.01	

Parameter	B5-6-8'
Benzo(a)anthracene	1.25
Benzo(b)fluoranthene	1.04

LEGEND:

- BCP SITE BOUNDARY
- B4 — BORING LOCATION
- TP-1 — TEST PIT
- MW-1 — MONITORING WELL
- RRSCO EXCEEDED IN AT LEAST ONE SAMPLE FROM EXPLORATION LOCATION

SAMPLE LOCATION AND DEPTH

Parameter	MW6-4.5-7'
Indeno(1,2,3-cd)pyrene	0.53

ANALYTE DETECTED

CONCENTRATION DETECTED (mg/kg)

NOTES:
1. MG/KG = MILLIGRAMS PER KILOGRAM.
2. RRSCO = RESTRICTED-RESIDENTIAL SOIL CLEANUP OBJECTIVE.
3. NE = RRSCO NOT EXCEEDED
4. AERIAL IMAGE FROM GOOGLE EARTH PHOTOGRAPHY 2015.

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JOB NO.: 0424-017-001

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: RFL
DATE: AUGUST 2017
CHECKED BY:
APPROVED BY: TF

RRSCO EXCEEDANCES IN SUBSURFACE SOILS SVOCs

ALTERNATIVE ANALYSIS REPORT
QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK

PREPARED FOR:
QUEEN CITY LANDING

FIGURE 5

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 6; SUBSOIL RRSCO Exceedances - Metals.dwg, DWG To PDF.pc3

LEGEND:

- BCP SITE BOUNDARY
- B4 — BORING LOCATION
- TP-1 — TEST PIT
- MW-1 — MONITORING WELL
- RRSCO EXCEEDED IN AT LEAST ONE SAMPLE FROM EXPLORATION LOCATION

SAMPLE LOCATION AND DEPTH

Parameter	TP-6-5-6'
Mercury	0.829

ANALYTE DETECTED — CONCENTRATION DETECTED (mg/kg)

NOTES:
1. MG/KG = MILLIGRAMS PER KILOGRAM.
2. RRSCO = RESTRICTED-RESIDENTIAL SOIL CLEANUP OBJECTIVE.
3. NE = RRSCO NOT EXCEEDED
4. AERIAL IMAGE FROM GOOGLE EARTH PHOTOGRAPHY 2015.

N

150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

DATE: AUGUST 2017
DRAFTED BY: RFL

Parameter	F3-3'	F3-6.5-8'
Lead	417	NE
Mercury	NE	2.05

Parameter	TP-6-5-6'
Mercury	0.829

Parameter	F4-3'
Chromium, Total	472
Manganese	8910

Parameter	E6-7-8'
Mercury	1.19

Parameter	E8-7-8'
Arsenic	18.9
Copper	280
Lead	480

Parameter	D8-5-8'
Arsenic	24
Lead	518
Mercury	1.06

Parameter	E2-7.5-8.5'
Mercury	0.826

Parameter	MW1-4-8'	MW1-10-12'	MW1-15-16'
Copper	NE	278	NE
Mercury	1.55	NE	NE

Parameter	A9-7-8'	A9-15'
Arsenic	16.3	NE

Parameter	D2-3'	D2-15'
Manganese	4479	NE

Parameter	TP-2-6-7'
Mercury	1.44

Parameter	C1-6-7'
Arsenic	16.6
Lead	423

Parameter	MW6-4.5-7'	MW6-8-10'	MW6-14-16'
Arsenic	16.3	NE	NE

Parameter	MW7-2-4'	MW7-12-14'	MW7-14-16'
Mercury	0.828	NE	NE

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RRSCO EXCEEDANCES IN SUBSURFACE SOILS
METALS

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK

PREPARED FOR
QUEEN CITY LANDING

FIGURE 6

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 7; Groundwater Exceedances.dwg

LEGEND:

BCP SITE BOUNDARY

MW-1 MONITORING WELL

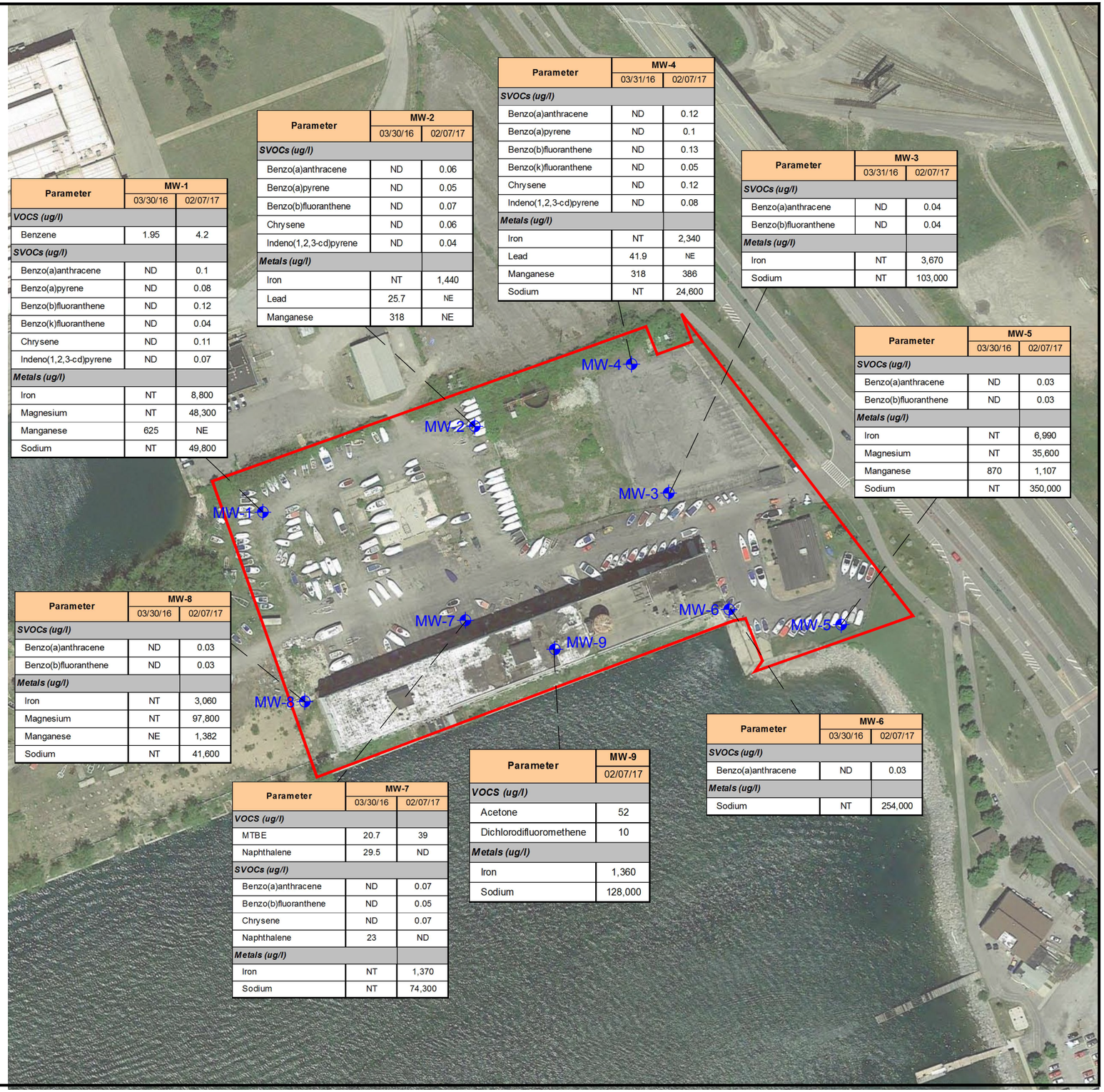
WELL DESIGNATION AND DATE SAMPLED

Parameter	MW-6	
	03/30/16	02/07/17
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.03
Metals (ug/l)		
Sodium	NT	254,000

ANALYTE DETECTED

CONCENTRATION DETECTED (ug/l)

NOTES:
1. UG/L = MICROGRAMS PER LITER.
2. GROUNDWATER QUALITY EXCEEDANCE MEANS NEW YORK STATE TOGS 1.1.1. AMBIENT WATER QUALITY STANDARDS AND GUIDANCE CRITERIA (GWQS).
3. NE = GWQS NOT EXCEEDED, ND = NOT DETECTED, NT NOT TESTED.
4. VOCs = VOLATILE ORGANIC COMPOUNDS.
5. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS.
6. MTBE = METHYL TERT BUTYL ETHER.
7. AERIAL IMAGE FROM GOOGLE EARTH PHOTOGRAPHY 2015.



Parameter	MW-1	
	03/30/16	02/07/17
VOCS (ug/l)		
Benzene	1.95	4.2
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.1
Benzo(a)pyrene	ND	0.08
Benzo(b)fluoranthene	ND	0.12
Benzo(k)fluoranthene	ND	0.04
Chrysene	ND	0.11
Indeno(1,2,3-cd)pyrene	ND	0.07
Metals (ug/l)		
Iron	NT	8,800
Magnesium	NT	48,300
Manganese	625	NE
Sodium	NT	49,800

Parameter	MW-2	
	03/30/16	02/07/17
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.06
Benzo(a)pyrene	ND	0.05
Benzo(b)fluoranthene	ND	0.07
Chrysene	ND	0.06
Indeno(1,2,3-cd)pyrene	ND	0.04
Metals (ug/l)		
Iron	NT	1,440
Lead	25.7	NE
Manganese	318	NE

Parameter	MW-4	
	03/31/16	02/07/17
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.12
Benzo(a)pyrene	ND	0.1
Benzo(b)fluoranthene	ND	0.13
Benzo(k)fluoranthene	ND	0.05
Chrysene	ND	0.12
Indeno(1,2,3-cd)pyrene	ND	0.08
Metals (ug/l)		
Iron	NT	2,340
Lead	41.9	NE
Manganese	318	386
Sodium	NT	24,600

Parameter	MW-3	
	03/31/16	02/07/17
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.04
Benzo(b)fluoranthene	ND	0.04
Metals (ug/l)		
Iron	NT	3,670
Sodium	NT	103,000

Parameter	MW-5	
	03/30/16	02/07/17
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.03
Benzo(b)fluoranthene	ND	0.03
Metals (ug/l)		
Iron	NT	6,990
Magnesium	NT	35,600
Manganese	870	1,107
Sodium	NT	350,000

Parameter	MW-8	
	03/30/16	02/07/17
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.03
Benzo(b)fluoranthene	ND	0.03
Metals (ug/l)		
Iron	NT	3,060
Magnesium	NT	97,800
Manganese	NE	1,382
Sodium	NT	41,600

Parameter	MW-7	
	03/30/16	02/07/17
VOCS (ug/l)		
MTBE	20.7	39
Naphthalene	29.5	ND
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.07
Benzo(b)fluoranthene	ND	0.05
Chrysene	ND	0.07
Naphthalene	23	ND
Metals (ug/l)		
Iron	NT	1,370
Sodium	NT	74,300

Parameter	MW-9
	02/07/17
VOCS (ug/l)	
Acetone	52
Dichlorodifluoromethene	10
Metals (ug/l)	
Iron	1,360
Sodium	128,000

Parameter	MW-6	
	03/30/16	02/07/17
SVOCs (ug/l)		
Benzo(a)anthracene	ND	0.03
Metals (ug/l)		
Sodium	NT	254,000

N

150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

DATE: AUGUST 2017
DRAFTED BY: RFL

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GROUNDWATER QUALITY EXCEEDANCES

ALTERNATIVE ANALYSIS REPORT

QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK

PREPARED FOR
QUEEN CITY LANDING

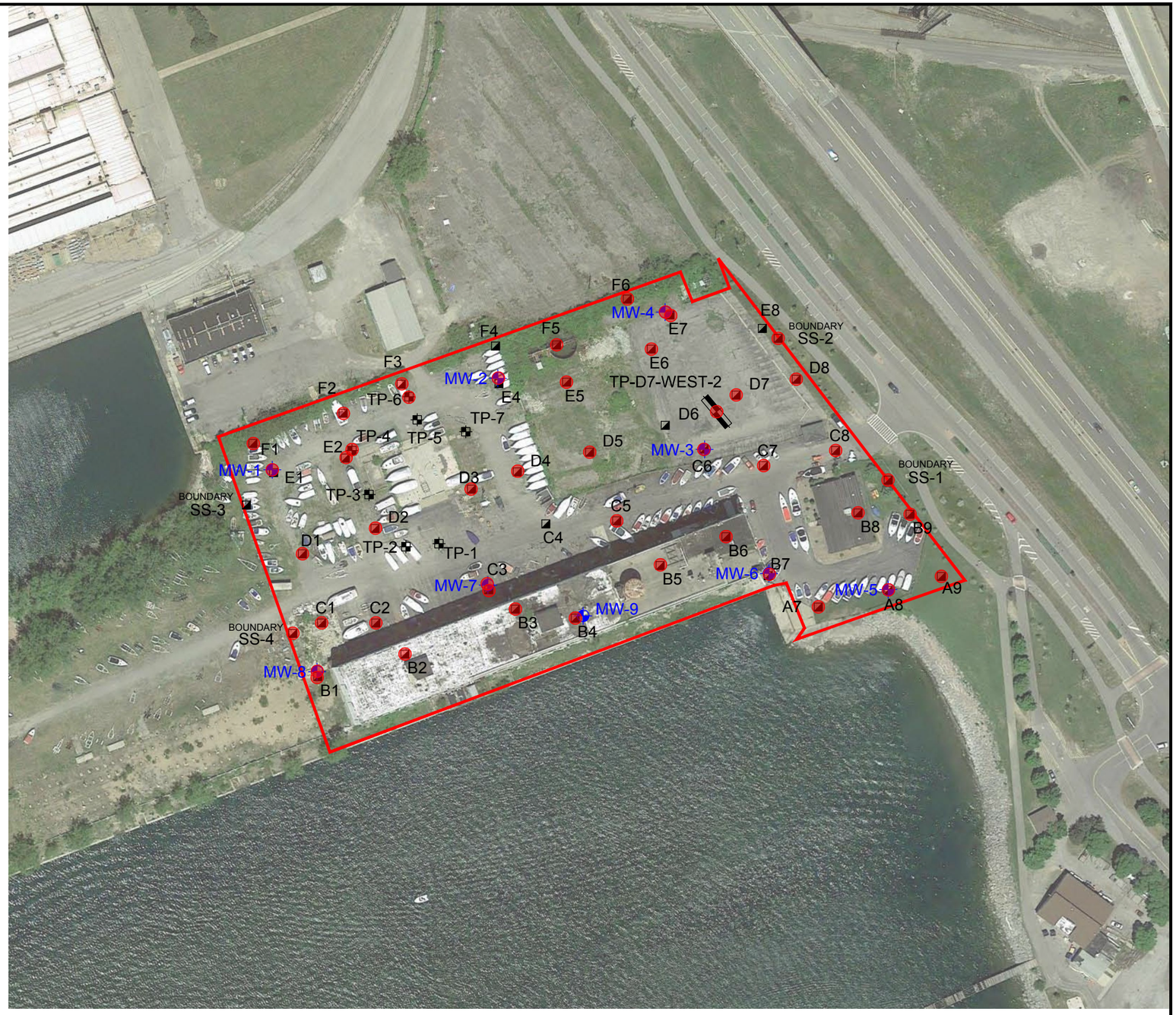
FIGURE 7

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 8; USCO Exceedances.dwg

LEGEND:

- BCP SITE BOUNDARY
- B4 — BORING / SURFACE SOIL LOCATION
- TP-1 — TEST PIT
- MW-1 — MONITORING WELL
- USCO EXCEEDED IN AT LEAST ONE SAMPLE FROM EXPLORATION LOCATION

NOTES:
1. USCO = UNRESTRICTED SOIL CLEANUP OBJECTIVE.
2. AERIAL IMAGE FROM GOOGLE EARTH PHOTOGRAPHY 2015.



N

150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

DATE: AUGUST 2017
DRAFTED BY: RFL

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USCO EXCEEDANCES IN SOIL

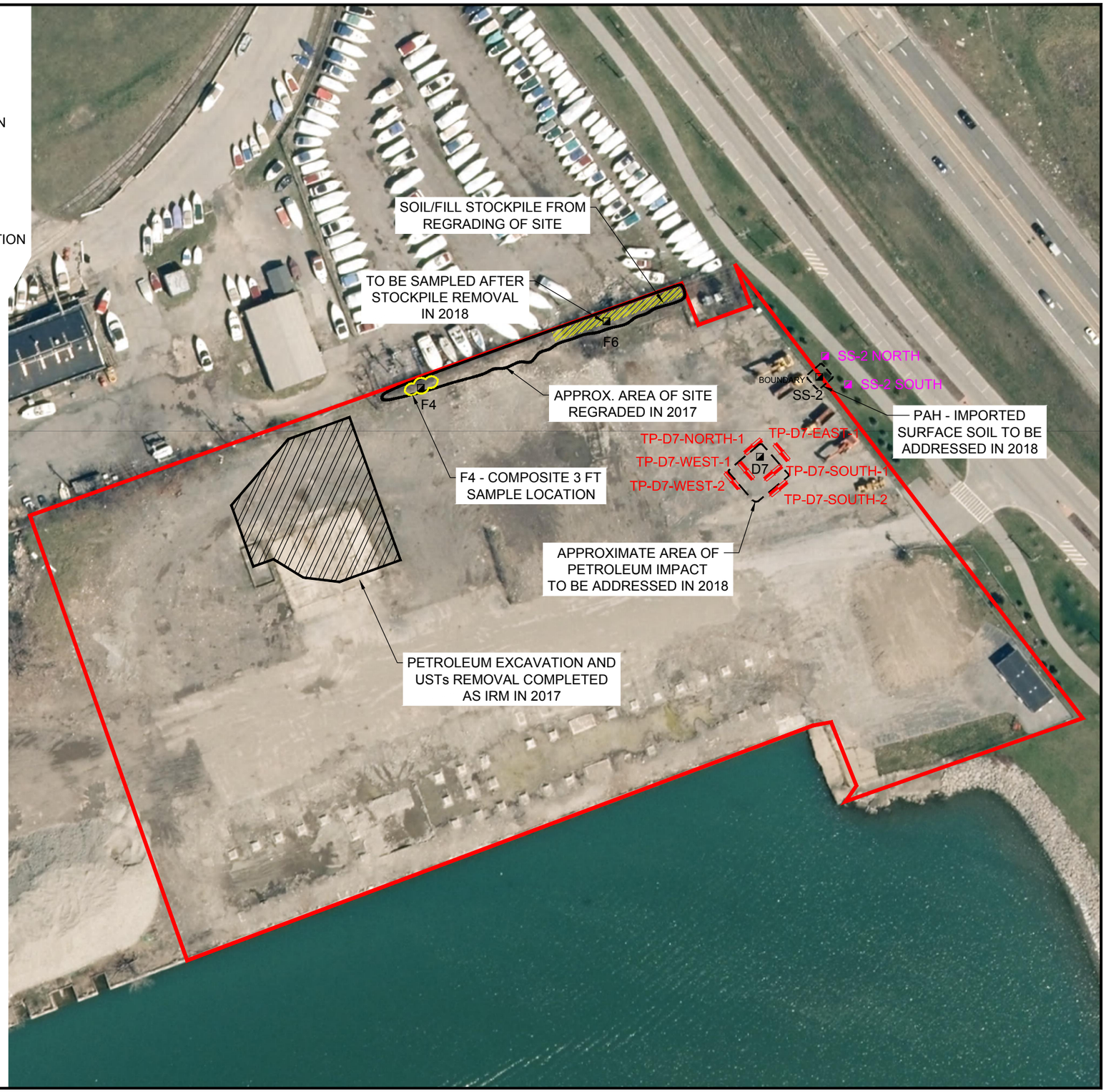
ALTERNATIVE ANALYSIS REPORT
QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK
PREPARED FOR
QUEEN CITY LANDING

FIGURE 8

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 9; Areas of Remedial Action.dwg

LEGEND:

- BCP SITE BOUNDARY
- APPROXIMATE LIMITS OF THE PETROLEUM EXCAVATION
- F-2 — INVESTIGATION LOCATIONS COMPLETED BY OTHER
- SS-2 NORTH — OFF-SITE INVESTIGATION LOCATION (DEC 2017)
- TP-D7-SOUTH-1 — ON-SITE TEST PIT INVESTIGATION LOCATION (DEC 2017)



N

100' 0' 100' 200'

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

DATE: JANUARY 2018
DRAFTED BY: CEH

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JOB NO.: 0424-017-001

AREAS OF REMEDIAL ACTION

ALTERNATIVES ANALYSIS REPORT

QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK

PREPARED FOR
QUEEN CITY LANDING

FIGURE 9

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 10; Site Plan Cover SystemRev.dwg, DWG To PDF.pc3

LEGEND:

- BCP SITE BOUNDARY
- SOIL COVER SYSTEM
- HARDSCAPE

NOTES:
1. AERIAL IMAGE FROM GOOGLE EARTH PRO 2017.

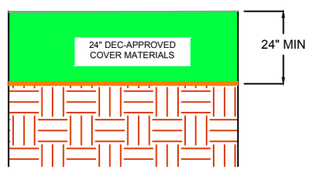
100' 0' 100' 200'

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

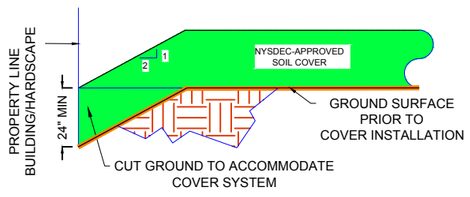
COVER SYSTEM DETAILS

NTS

VEGETATED SOIL COVER SYSTEM DETAIL
NTS



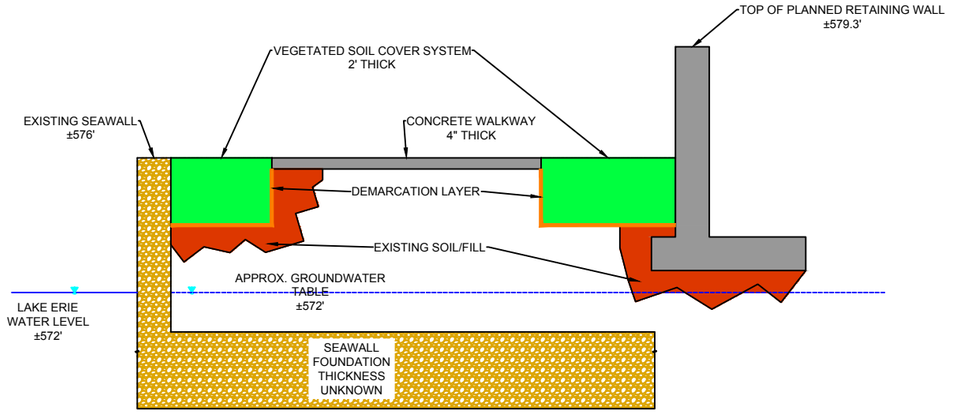
TIE-IN DETAIL
NTS



DEMARCATION LAYER

DETAIL A-A'

NTS



DATE: MAY 2018
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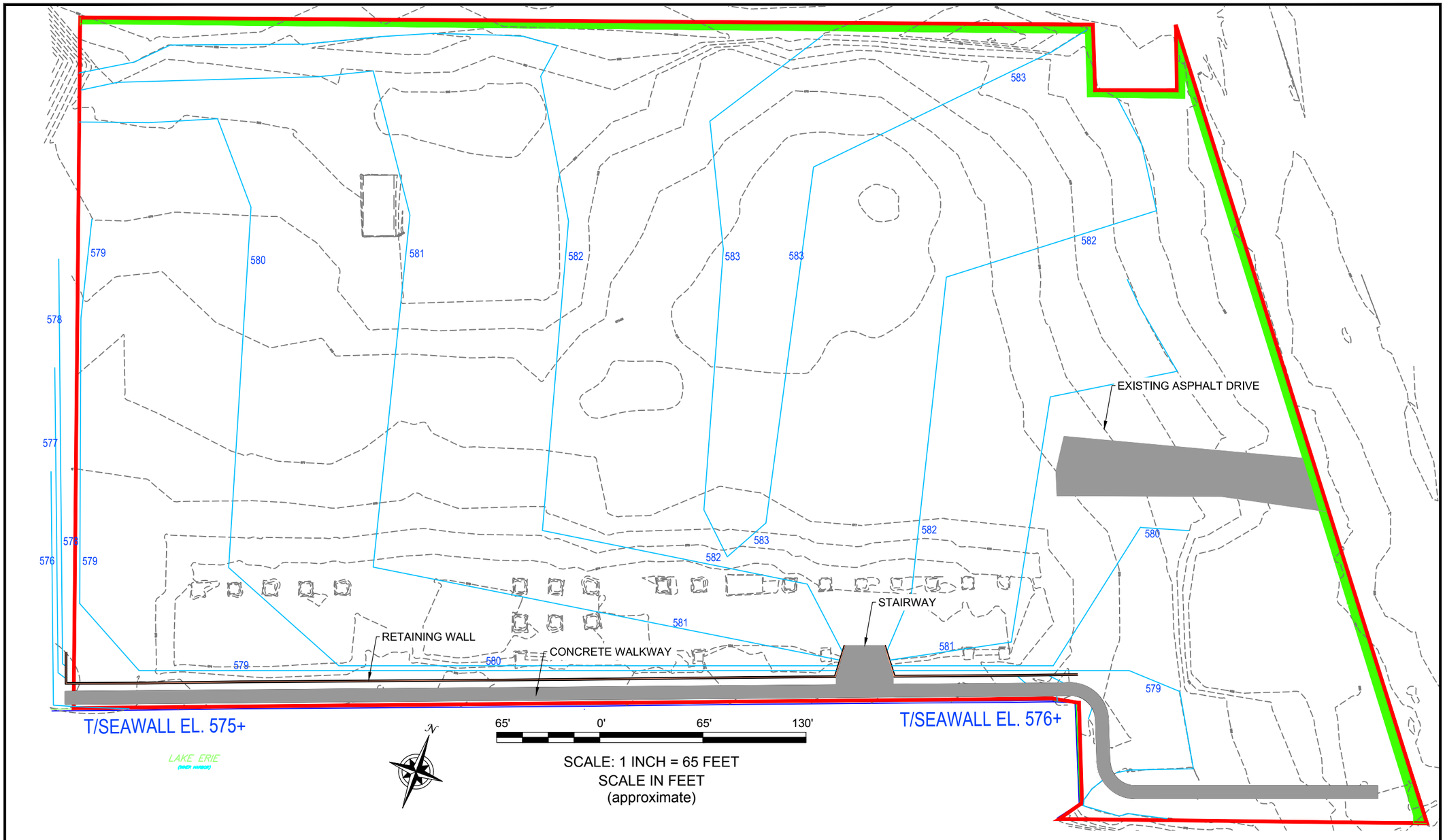
JOB NO.: 0424-017-001

PROPOSED COVER SYSTEM

ALTERNATIVE ANALYSIS REPORT
QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK
PREPARED FOR
QUEEN CITY LANDING, LLC

FIGURE 10

F:\CAD\Benchmark\Queen City Landing\AAR\Figure 11; Site Grading Plan.dwg



LEGEND

- BROWNFIELD SITE BOUNDARY
- AREA TO BE CUT AT LEAST TWO FEET, PLACE 2' OF NYSDEC- APPROVED COVER MATERIALS AND VEGETATE. RELOCATE CUTTINGS ON SITE FOR USE BENEATH THE COVER SYSTEM WITH NYSDEC APPROVAL.
- AREA OF NEW OR EXISTING HARDSCAPE (ASPHALT, CONCRETE WALKWAY, RETAINING WALL)
- 583 CONCEPTUAL FINAL GRADE CONTOUR; ELEVATION IN FEET DATUM NAVD 88.
- EXISTING GROUND CONTOUR AFTER REMEDIATION; ELEVATION IN FEET DATUM NAVD 88.

NOTES:
1. GRADING PLAN DEVELOPED FROM A GRADING PLAN C-102 PROVIDED BY TREDO ENGINEERS DATED MAY 11, 2018.
2. AREAS WHERE THERE ARE LESS THAN 2 FEET OF COVER WILL NEED TO BE CUT AN APPROPRIATE DEPTH IN ORDER TO ALLOW 2' OF NYSDEC-APPROVED COVER MATERIALS TO BE PLACED TO MEET GRADING PLAN. CUTTINGS TO BE RELOCATED BENEATH THE ON-SITE COVER SYSTEM.

DATE: JANUARY 2018
DRAFTED BY: RFL

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JOB NO.: 0424-017-001

CONCEPTUAL GRADING PLAN

ALTERNATIVE ANALYSIS REPORT
QUEEN CITY LANDING SITE
BCP SITE NO. C915304
BUFFALO, NEW YORK
PREPARED FOR
QUEEN CITY LANDING, LLC

FIGURE 11

APPENDIX A

LAND USE FACTORS

APPENDIX A
LAND USE EVALUATION

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 Queen City Landing Site, located in the City of Buffalo, Erie County, New York, are presented below.

1. *Current use and historical and/or recent development patterns:* The Site has been owned by Queen City Landing, LLC (QCL) since November 2007. Prior to November 2007, the Site ownership has included Terminal & Transportation Corporation of America (approximately 1927 to 1940s), Freezer Queen Foods, Inc. (1958 to 2004), Home Market Foods, Inc. (2004 to 2007), 975 Fuhrman Blvd Inc. (March 2007-November 2007).

   Prior to QCL ownership, which was responsible for the Freezer Queen building demolition, the Site was used for food manufacturing from 1958 to 2004. A marine used the property for boat repair and storage from 2004 until September 2015. The Site has been vacant from 2016 to current.

   The proposed use of the Site will include be a residential redevelopment with a commercial component that will be consistent with the Buffalo Green Code. The Site is zoned N-1S: Secondary Center, mixed-use mid-rise development clusters defined by large-footprint structures.

   It is stated in the Buffalo Harbor Brownfield Opportunity Area Step 2 Nomination Document (BOA Nomination Document), "A strip of land along the City Ship Canal has been zoned Mixed-Use Center to take advantage of access to the Inner Harbor by ferry, as well as views of the downtown core. Allowance has also been made for redevelopment at the foot of Ohio Street, where the former Port Terminal complex and Freezer Queen are located."

   Additionally, the City of Buffalo Local Waterfront Revitalization Program (LWRP) has specifically identified the Ford Terminal Complex/Freezer Queen property as a BOA Strategic Site. The document does on to state that "The Ford Terminal Complex and the former Freezer Queen manufacturing facility offer unique opportunities for water enhanced mixed use development. The Freezer Queen site is currently being developed as a water-enhanced mixed use building.

APPENDIX A
LAND USE EVALUATION

The proposed redevelopment would be considered restricted-residential under 6NYCRR Part 375. **Accordingly, a residential site redevelopment would be acceptable for the Site.**

Applicable zoning laws and maps: The Site is located within an area identified by the Green Code as N-1S: Secondary Center, mixed-use mid-rise development clusters defined by large-footprint structures.

The proposed redevelopment for residential use with a commercial component will be consistent with the City of Buffalo's Buffalo Green Code, BOA Nomination Document and LWRP.

2. *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 is within the Buffalo Harbor BOA which is currently at Step 2: Nomination Document.**

3. *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:* According to the Buffalo Green Code, Unified Development Ordinance dated September 2016, the Site is within the boundaries of an area that was changed from M-3 – Heavy Industrial to N-1S: Secondary Center. **The proposed redevelopment of the Site for a residential use with a commercial component is consistent with the Buffalo Green Code, BOA Nomination Document and LWRP.**

4. *Proximity to real property currently used for residential use, and to urban, commercial, industrial, agricultural, and recreational areas:* The Site is located in an area that was changed from M-3 – Heavy Industrial to N-1S: Secondary Center. The properties adjacent to the north and south have both been changed from M-3 to D-OG: Greens and parks, characterized primarily by trees and landscapes and designed for passive use. Lake Erie is adjacent to the Site to the west and Fuhrmann Boulevard and Route 5 to the east. **Adjacent properties are zoned for recreational use. The proposed redevelopment of the Site for residential use with a commercial component is consistent with the Buffalo Green Code, BOA Nomination Document and LWRP.**

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5. *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:* **Comments have been received from the public.**

6. *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 properties are a mixed use of recreational, commercial and industrial properties. The proposed redevelopment of the Site for residential use with a commercial component is consistent with the Buffalo Green Code, BOA Nomination Document and LWRP. This redevelopment project does not pose environmental justice issues.**

7. *Federal or State land use designations:* The property is designated Urban Land by the Soil Conservation Service. Based on the Remedial Investigation completed, the Site contains a significant amount of fill material. **Reuse in a restricted residential capacity is typical in urban areas where background conditions sometimes preclude achieving unrestricted use soil cleanup objectives.**

8. *Population growth patterns and projections:* The City of Buffalo, encompassing 40 square miles, has a population of 261,025 (2011 US Census Bureau), a decrease of 0.1% from 2010 U.S. Census. The population density in the City is 5,525.6 people per square mile. The Site is located in Census Tract 110, in the area of the city zoned for residential, commercial and industrial use. **Reuse of the Site for residential use with a commercial component is consistent with the Buffalo Green Code, BOA Nomination Document and LWRP.**

9. *Accessibility to existing infrastructure:* The Site is located along Fuhrmann Boulevard just west of Route 5, with easy access to the City of Buffalo streets and nearby Interstate 190 which connects with Route 33 and Interstate 90. Utilities (sewer, water, gas, and electric) are present along the boulevard. **Existing infrastructure supports the proposed redevelopment.**

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10. *Proximity of the Site to important cultural resources, including federal or State historic or heritage sites or Native American religious sites*: **No cultural resources were identified within ½ mile of the Site.**

11. *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:* The Site is adjacent to the City of Buffalo Outer Harbor of Lake Erie. The NYSDEC Environmental Resource Mapper has two (2) listings for rare plant and rare animals in the vicinity of the Site. One (1) listing is for Lake Sturgeon which live in Lake Erie. The 2nd does not provide an information but is likely related to the Tift Nature Preserve located southeast of the Site across Route 5.

    No State or Federal wetlands exist on the Site. The City of Buffalo Outer Harbor of Lake Erie is adjacent to the south of the Site. According to the NYSDEC's Environmental Resource Mapper (ERM) there are two (2) listings for rare plant and rare animals in the vicinity of the Site. One (1) listing is for Lake Sturgeon which live in Lake Erie. The 2nd does not provide an information but is likely related to the Tift Nature Preserve located southeast of the Site across Route 5.

12. *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:* Groundwater at the Site is assigned Class "GA" by 6NYCRR Part 701.15. Nine (9) overburden groundwater monitoring wells were installed on-Site as part of the RI. Groundwater data obtained during the RI indicate low level VOC, SVOC and metals were detected slightly above their respective Class GA criteria.

    Although low level groundwater contamination is present at the Site, the concentrations present (less than 100 micrograms per liter (ug/l) for total volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs)) do not warrant remedial action. Achieving these types of levels for total concentrations in groundwater would be considered a success from a remedial standpoint at both BCP and petroleum cleanup sites and NYSDEC has considered remediation complete at Sites across the State of New York at these concentration levels. The metals present in the groundwater (iron, magnesium, manganese, and sodium) are commonly found

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in urban areas, particularly in areas where significant fill material is present, and NYSDEC has not required them to be addressed at BCP sites at the levels present at the QCL Site.

The absence of potable wells, wellhead protection, and groundwater recharge areas indicates that cleanup to restricted-residential use conditions will not pose a drinking water threat.

13. *Proximity to flood plains:* A portion of the Site is within the 100-year flood plain. The City of Buffalo Building Code requires that the first floor elevation is at least 1 foot above the 100-year flood plain. The proposed redevelopment plan proposes to have the first floor building slab 2 feet above the 100 year flood level and raise the grades of other areas of the Site above the 100-year flood plain. Redevelopment of the Site will require raising grades across the Site about 3 to 7 feet.

    The Site's current condition allows surface water/flood water to contact impacted fill material at ground surface. Redevelopment of the Site will include an engineered cover system which will provide a hardscape and/or 2 foot soil cover over the entire 7.72-acres Site preventing surface water/flood water from contacting remaining contaminants at the Site. **As such, cleanup and redevelopment to restricted-residential use standards does not pose a threat to surface water/flood water and will improve the current Site conditions.**

14. *Geography and geology:* Heterogeneous urban fill is present at the Site at depths ranging from 8 to 17 feet below grade. The urban fill material at the Site contains, crushed rock, sand, silt, clay, plastics, construction debris, lumber, ash/cinders, ceramics, bricks, and metal. Underlying the urban fill in portions of the Site is construction fill placed in Lake Erie to create the bulk of the land that encompasses the Site. This construction fill consists of fine to coarse sand. Depth to and of construction material varies in different areas of the Site. The construction fill was found in alternating intervals with urban fill and clay layers throughout the Site, but was typically the last layer before native soil was encountered. Native soil was encountered in borings in the eastern portion of the Site, beneath the construction fill. The native soil consisted of silty clay with a grey appearance. Native soils were only encountered on the far eastern side of the Site at depths of 9.6 feet to 13.2 feet bgs. **Geography and geology should not have an impact on the residential**

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redevelopment after the remedial action is implements and will improve Site conditions.

15. *Current institutional controls applicable to the site:* **No institutional controls are currently present that would affect redevelopment options.**

Based on the above analysis, redevelopment of the Site for residential use is consistent with the Buffalo Green Code, BOA Nomination Document and LWRP. This redevelopment does not pose additional environmental or human health risk, but rather improves the Site condition and enhances the waterfront redevelopment in this area of the City of Buffalo.