Supplemental Remedial Investigation Work Plan

Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), NY
NYSDEC BCP Site 241048

Prepared for:
New York State Department
of Environmental Conservation

Division of Environmental
Remediation, Region 2

Prepared by:
Stantec Consulting Services Inc.

February 13, 2025

Sign-off Sheet

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Prepared by Donald F. Moore
(signature)

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Sign-off Sheet

CERTIFICATION

I, Donald Moore, certify that I am a qualified environmental professional as defined in 6 NYCRR Part 375 and that this Supplemental Remedial Investigation Work Plan 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).

Donald F. Moore 2/13/2025

Signature Date

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AWQSGVS	Ambient Water Quality Standards and Guidance Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BLS	Below Land Surface
CAMP	Community Air Monitoring Plan
CSM	Conceptual Site Model
DER	Division of Environmental Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
DUSR	Data Usability Summary Report
EFR	Enhanced Fluid Recovery
HASP	Health and Safety Plan
IAQ	Indoor Air Quality
IDW	Investigation Derived Waste
IRM	Interim Remedial Measure
LNAPL	Light Non-Aqueous Phase Liquid
MDL	Method Detection Limit
MRL	Method Reporting Limit
MGP	Manufactured Gas Plat
NGVD	National Geodetic Vertical Datum
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
POG	Protection of Groundwater
PRP	Potentially Responsible Party
PPM	Part per Million
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RIR	Remedial Investigation Report
RP	Remedial Party
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SOP	Standard Operating Procedure
SSD	Sub-slab Depressurization
SSSG	Sub-slab Soil Gas
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
TOGS	Technical and Operational Guidance Series

VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
VI	Vapor Intrusion

1.0 INTRODUCTION

Ahold U.S.A., Inc./Stop & Shop Supermarket Company LLC entered into a Brownfield Cleanup Agreement (BCA, index no. C241048-11-17) with the New York State Department of Environmental Conservation (NYSDEC) in February 2018, to investigate and remediate a 5-acre property located at 112-15 Beach Channel Drive in Far Rockaway, Queens County, NY (the Site). Ahold U.S.A., Inc./Stop & Shop Supermarket Company LLC is a Volunteer in the Brownfield Cleanup Program. The BCA supplants the prior Voluntary Cleanup Agreement (VCA, index no. W2-0896-01-09) that had been executed between NYSDEC and Great Atlantic & Pacific Tea Company, Inc. (A&P), the former owner of the site.

The property is currently owned by Benenson Belle Harbor, LLC, which leases a grocery store in the shopping center to Ahold U.S.A. Inc (Ahold). The location of the property is shown on Figure 1. Pertinent features of the Site are shown on Figure 2. Historically, the grocery store had been leased by A&P. In July 2015, A&P filed for Chapter 11 bankruptcy protection. Subsequent phases of bankruptcy transactional proceedings associated with A&P, the bankruptcy court, and the property owner occurred that gave way to an auction purchase of the A&P operations by Ahold of Quincy, Massachusetts. The grocery store then re-opened as Stop & Shop Grocery Store. Ahold/Stop & Shop retained Stantec as the environmental professional for this Site.

In August 2021, Stantec submitted a draft Remedial Investigation Report (the "2021 RIR"), which described investigation activities and previous results of soil, groundwater, and vapor intrusion sampling conducted at the Site related to a historic release of dry-cleaning solvent at the Site as well as impacts related to the adjacent former Rockaway Park Manufactured Gas Plant (MGP). The activities included the collection of media samples for chlorinated volatile organic compounds (CVOCs) in the central and western portions of the Site and MGP-related constituents in the eastern portion of the Site that were the primary contaminants of concern identified during pervious investigation work conducted under the Site's former VCA.

This Supplemental Remedial Investigation Work Plan (SRIWP) is required by NYSDEC based on their review of the 2021 RIR and additional data summary tables and figures submitted by Stantec in August 2022, as well as on the enhanced analytical requirements of NYSDEC's Brownfield Cleanup Program (BCP). This supplemental work plan is designed to delineate the nature and extent of contamination at the Site in order to develop appropriate remedial actions to address all on-site contamination. The SRIWP was developed based on collaboration between the property owner, Stantec, GEI Consultants, P.C. (GEI), National Grid USA Service Company, Inc., and the NYSDEC. This SRIWP is being submitted on behalf of the Owner/Volunteer:

Ahold Delhaize USA (Ahold)
Retail Business Services
1385 Hancock St, 10 Floor

Quincy, MA 02169
Point of Contact: Mr. Jeff Morgan
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NY Professional Engineer: Alexander DeNadai – (610) 840-2550

The Site consists of Tax Block 16166, Lot 434 on the NYC Tax Map (see Figure 3).

2.0 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The Site is located at 112-15 Beach Channel Drive, Belle Harbor (Queens), Queens County, New York (Figure 1). Coordinates for the central location of the property are Latitude 40.34.55.6, Longitude 73.50.06.7. The property is identified further as Block 16166, Lot 434, and comprises approximately 5 acres (see Figure 2).

The Site currently consists of a shopping center building encompassing approximately 57,000 square feet with tenant retail commercial operations. The remaining 3.7 acres of the Site are paved parking. The shopping center is currently active and is occupied by a Stop & Shop Supermarket, Liquor Wine Warehouse, Sofia's Nail Salon (occupying the space which was formerly occupied by Bell Boy Dry Cleaners), Ciros Pizza, and a Citibank branch bank.

The Site is bordered by Beach Channel Drive to the north, a Mobil gasoline station to the northeast, Wainwright Court/Rockaway Freeway to the east, a New York City Subway yard and tracks to the south, a New York City Department of Transportation parking lot to the west, and a Post Office and retail stores to the northwest. An electrical substation and former Rockaway Park MGP (NYSDEC site no. 241029) are located immediately to the east of the Site across Wainwright Court. Commercial properties are located across Beach Channel Drive to the north and include auto repair shops and another gasoline station.

2.2 SITE HISTORY

The current Site layout is different now than it was in the past. An aerial photo from 1966 depicts the previous building oriented east to west parallel to Beach Channel Drive (see Figures 2 and 2A). It is reported that a dry cleaner operated in a portion of this previous building. As described in Section 3.1, and shown on Figure 2, this portion of the previous building is outlined or depicted by "2008 HRC Injection Area". A gasoline station currently located at the northeast corner of the block is evident as far back as 1954. The aerial photos also show a rail spur and building structure located within the south boundary of the Site indicating some level of industrial activity at the time. A building and power grid substation appears in the aerial photos just beyond the most southeast corner of the Site. This building appears to be associated with the power company property located to the east or the subway yard to the south.

A photo from 1980 shows an addition to the northern portion of the building. A photo from 2006 shows the current building footprint. The primary change in the footprint appears to be the loss of the most western portion of the original shopping center and an addition of the building to the south. Figure 1 depicts the configuration of the building circa 1992 (i.e., running east to west parallel to Beach Channel Drive). Figure 2 depicts the present configuration of the building, property boundary, and various exterior sampling locations. Figure 2A shows the lease units and various interior sampling locations.

2.3 PHYSICAL SETTING

2.3.1 Topography

Surface topography at the Site is generally flat and slopes gently to the north, with a ground surface elevation of approximately 10 feet above mean sea level (msl). Note that the vertical datum is based on the National Geodetic Vertical Datum 1929 (NGVD 1929). No surface water or wetland areas were observed on-site during Stantec's field work. The nearest water body is Jamaica Bay, which is located approximately 300 feet to the north of the Site, across Beach Channel Drive.

2.3.2 Geology

According to available maps and information, Long Island is part of the Atlantic Coastal Plain Geomorphic Province, which stretches north and south along the east coast. Long Island is primarily a ridge of direct contact glacial and glacial outwash sediments that almost completely cover the underlying Cretaceous sedimentary bedrock. Long Island topography, therefore, is glacial topography, with little or no influence from the underlying bedrock.

The Site is further located on an outer barrier beach that is part of the Long Island and New York City barrier islands. These are a string of barrier islands or beaches that divide the lagoons south of Long Island (i.e., Jamaica Bay) from the Atlantic Ocean.

The soils encountered at the Site consisted of fill material (fine to coarse sand and gravel with pieces of coal fragments and concrete) from ground surface to approximately 5 to 6 feet below land surface (bls). Underlying the fill, native soils encountered consisted of fine sand. Bedrock was not encountered in any of the borings drilled at this Site.

2.3.3 Hydrology

Details of the Site's hydrogeology (including additional tables and figures) are presented in the 2021 RIR and briefly described below.

Depths to groundwater, as measured in Site monitoring wells, typically range from five to seven feet bls. Well construction details are presented in Table 1. Depths to groundwater measured during groundwater sampling activities (June 26, 2012) ranged from 5.09 to 6.37 feet bls in the shallow wells and from 5.60 to 6.93 ft bls in the deep wells (see Table 2). The corresponding measuring point elevations (top of polyvinyl chloride (PVC) well riser in feet msl) for the shallow wells were used to derive groundwater elevations shown in Table 2 and the Groundwater Contour Map (Figure 4). Note that groundwater elevations are not posted at MW-108S, MW-109S, or MW-110S due to the fact that these wells were not drilled in June 2012. As shown on Figure 4, groundwater flow is towards the north-northeast across the Site at a relatively flat hydraulic gradient of 0.004 feet per foot (ft/ft). A groundwater mound is depicted in the vicinity of MW-102S.

As described in the 2021 RIR, historic groundwater elevation data indicate that groundwater levels and flow in the shallow water table zone are not influenced by tidal action, but that levels and flow in the mid and deep overburden zones are influenced by the tides (see Table 2a). Groundwater in the shallow overburden is shown to flow to the north-northeast during both low and high tides (see Figures 4a and 4d). During both tides, a groundwater mound in the approximate center of the Site (in the vicinity of MW-102S/MW-102D) is present. The change in elevations in the shallow wells, from low to high tide, is minimal and on the order of about one inch.

Groundwater in the mid-level overburden is shown to be somewhat radial in the center of the Site during both low tide (Figure 4b) and high tide (Figure 4e). Water level elevations are also shown to rise approximately one to two feet from low to high tide. Groundwater in the deep overburden wells is shown to flow towards the north during low tide (Figure 4c) and towards the northeast during high tide (Figure 4f). Water level elevation changes in the deep overburden wells are similar to the mid-level overburden wells, in that elevations rise about one to two feet from low to high tide.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

Remedial investigation activities conducted at the Site are described in, or included by reference in, the following reports submitted to the NYSDEC Division of Environmental Remediation (DER).

- Site investigations initiated by Malcolm Pirnie, Inc. (MPI) from November 2000 to February 2001 to evaluate potential impacts to subsurface conditions associated with an on-site dry cleaner, nearby rail/subway yard, adjacent coal/gasification facility, and historic fill.
- Documentation relating to A&P entering into a Voluntary Cleanup Agreement with NYSDEC dated October 2001.
- A revised Remedial Investigation Report & Supplemental Remedial Investigation & Corrective Action Work Plan dated December 2001 prepared by Whitestone Associates, Inc. (Whitestone).
- A Site-Specific Health and Safety plan (HASP) and Quality Assurance/Quality Control (QA/QC) and Sampling & Analyses Plan dated March 1, 2002, prepared by Whitestone.
- A Remedial Investigation Report and Supplemental Remedial Investigation Workplan dated May 2003 prepared by Whitestone.
- A follow-up investigation by Whitestone. completed between May 2004 and June 2004 and presented in a Supplemental Remedial Investigation Report & Remedial Investigation/Corrective Action Work Plan dated August 2004 prepared by Whitestone.
- Correspondence dated August 29, 2007, and October 9, 2007, and May 7, 2008, associated with comments to the August 2004 Supplemental Remedial Investigation Report & Remedial Investigation/Corrective Action Work Plan prepared by Whitestone.
- Supplemental Remedial Investigation/Interim Corrective Action Report & Remedial Investigation/Corrective Action Work Plan dated December 26, 2008, prepared by Whitestone.
- Supplemental Remedial Investigation/Pilot Test Report & Remedial Investigation/ Corrective Action Work Plan dated January 12, 2009, prepared by Whitestone.
- Response to April 30, 2009 NYSDEC Comment Letter, dated May 28, 2009, prepared by Whitestone.
- Supplemental Remedial Investigation Work Plan and Data Summary dated July 2011, prepared by Stantec.
- Well installation (MW 101 through MW 110 – October 2012) by Stantec.
- Interim Remedial Measures Report with data summary in July 2013 and Addendum in January 2014, prepared by Stantec.
- Groundwater sampling in June 2012, January 2013, January 2018, and August 2020 by Stantec.
- Soil Vapor and Indoor Vapor Intrusion sampling in March 2014, April 2015, January 2018, August 2020, March 2022, March 2023, and March 2024 by Stantec.
- Supplemental Investigation Report with data summary dated October 2017 prepared by Stantec.

- Draft Remedial Investigation Report with data summary dated February 2018 prepared by Stantec.
- Quality Assurance Project Plan (QAPP) for groundwater sampling for per- and poly-fluoroalkyl substances (PFAS) and 1,4-dioxane dated August 2018 prepared by Stantec.
- Dense Non-Aqueous Phase Liquid (DNAPL) Recover Evaluation Workplan dated April 2020 prepared by GEI.
- DNAPL Recovery Evaluation 2020 – 2021 by GEI.
- Groundwater Sampling at MW-1 in November 2020 by GEI.
- Revised Draft Remedial Investigation Report dated August 2021 prepared by Stantec.
- Revised Remedial Action Work Plan dated October 2021, prepared by Stantec.
- Draft Supplemental Remedial Investigation Work Plan dated December 2022 prepared by Stantec.
- Revised Supplemental Remedial Investigation Work Plan dated November 2023 prepared by Stantec
- Monthly Progress Reports, new data reporting and periodic performance assessment of the onsite sub-slab depressurization system (SSDS) prepared by Stantec.

In general, the remedial investigation (RI) activities conducted at this Site suggested there have been three distinct releases of oil and hazardous materials at the Site:

1) a release of dry cleaning solvent assumed to be associated with two different locations at the Site, over two different time periods: (i) operations within the former western portion of the original shopping center (i.e., in the area of existing monitoring wells, MW-4/4D) and (ii) with a former Bell Boy Dry Cleaner that was located within the existing building to the north of the present grocery store. Note that this unit is currently the Sofia's Nail Salon;

2) the presence of residual MGP wastes, located primarily in the southeast corner of the property in the area of existing monitoring well MW-1, apparently from the former operations of the MGP located just east of the Site. This area of the Site is being investigated by GEI on behalf of National Grid under the auspices of the BCA; and

3) the potential co-mingling of petroleum hydrocarbons with other contaminants identified in groundwater at the Site likely resulting from storm water catch basins/leaching storm drains or a release of unknown origin, volume and time period from one or more of the operating gasoline stations, auto repair shops, and/or the subway yard located adjacent to the northeast, north, or south boundaries of the Site.

3.1 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

The following is a brief description of the RI work and findings.

3.1.1 Soil

Between November 2000 and February 2001, MPI oversaw the drilling of seven soil borings within the former Bell Boy Cleaners unit. As shown on the figure presented in Appendix A, these borings are identified as APBH-14, APBH-15, APBH-16, APBH-27, APBH-34, APBH-35, and APBH-36. Please note that Stantec was not able to review MPI's report on this work, as the report was not available, and that the following description is based on Stantec's review of subsequent reports prepared by Whitestone. Soil samples collected from beneath the concrete slab from the seven borings had reported concentrations of tetrachloroethene (also known as perchloroethene or PCE) of 7.2 to 18 parts per million (ppm), which exceeded the Technical and Administrative Guidance Memorandum (TAGM) guidance value of 1.4 ppm applicable at that time. However, according to Whitestone, the MPI results indicated that the impacted soil did not extend to the groundwater interface, at approximately six to seven feet below the concrete slab.

Soil sample analytical results did not reveal significant evidence of soil source areas for volatile organic compounds (VOCs). However, soil samples collected from several borings in the southeastern corner of the Site (rear parking lot area) had reportable concentrations of semi-volatile organic compounds (SVOCs). The total concentration of these compounds was 11.4 parts ppm which was below the applicable NYSDEC TAGM guideline criteria of 500 ppm for total SVOCs. According to Whitestone, MPI suggested this contamination was potentially associated with MGP wastes originating from the adjoining property.

In March 2003 and May 2004, Whitestone conducted soil borings, monitoring well construction, and groundwater sampling at eight locations at the Site. The locations (identified as MW-1 through MW-8S/D) are shown on Figure 2 and generally corresponded to some of the 2000/2001 borings (as shown on the figure in Appendix A). Soil samples for analytical testing were collected from only MW-1, MW-2, MW-3, MW-7, and MW-8S. The soil boring results indicated that fill underling the Site (is covered by asphalt and the Site building). Soil sample analytical results showed that no VOCs, SVOCs, metals, pesticides, or polychlorinated biphenyls (PCBs) were detected above TAGM guidelines in MW-2 and MW-3, but that only SVOCs and metals were detected at levels above TAGM guidelines from samples collected from MW-1, MW-7S, and MW-8S.

In 2012 Stantec conducted investigation work in the western portion of the Site that included a Membrane Interface Probe (MIP) survey (to evaluate the proper siting of new monitoring wells), soil borings, soil sampling, and monitoring well construction and sampling. Locations of the MIP borings (MIP-1 to MIP-11) and monitoring wells (MW-101 to MW-107S) are shown on Figure 2. These results were compared against the applicable NYSDEC Part 375 soil cleanup objectives (SCOs). Laboratory analytical results for soil are presented in Table 4a. Spider maps depicting exceedances of SCOs for soil are presented on Figure 5A (western portion of Site) and Figure 5B (eastern portion).

As shown on Table 4a, only one soil sample from the 2012 work, collected just above the field-identified water table (MW-103, 5.2 – 6.2 feet bls), had an elevated VOC concentration reported above laboratory detection limits. This sample had a reported concentration of PCE at 16 ppm, which is above its applicable Protection of Groundwater (POG) SCO of 1.3 ppm. As shown on Figures 2 and 3, MW-103 is located approximately 20 feet southwest of the MW-4/4D well pair and in the vicinity of an area that encompassed an injection of Hydrogen Release Compound (HRC©) in 2008 by Whitestone (i.e., the 2008 HRC area). Further details of this injection work are presented below in Section 3.2.1. All other soil samples from 2012 had concentrations of VOCs reported at levels below SCOs or below laboratory detection limits.

Concentrations of SVOCs in soils were reported at levels exceeding POG SCOs in five samples (corresponding to just above the field-identified water table) in MW-102, MW-103, MW-104, MW-105, and MW-107 (see Table 4a and Figure 5A). The individual SVOCs exceeding SCOs in these five soil samples correspond to polycyclic aromatic hydrocarbons (PAHs) with the highest Total PAH levels occurring in MW-102 (488 ppm), MW-104 (86 ppm), MW-105 (45 ppm), MW-103 (36 ppm), and MW-107 (13 ppm). SVOC concentrations in the samples collected at deeper intervals in these same five borings were reported at levels below laboratory detection limits or below POG SCOs. SVOCs were also reported at levels below POG SCOs and/or below laboratory detection limits in both the shallow and deep interval samples collected from MW-101 and MW-106. The data suggest that soils impacted by PAHs are located at relatively shallow depths (i.e., from 0 to 10 feet bls) in the vicinity of the former western portion of the original shopping center.

As described in the 2021 RIR, Stantec evaluated the PAH concentrations in the collected shallow soils and compared the levels to background levels in New York and Massachusetts published by others[1]. The evaluation indicated that the types of specific PAHs (such as benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene) and concentrations reported in the western portion of the Site fall within the type and concentration ranges of the background samples. This suggests the PAHs reported in shallow soils in the western portion of the Site are more indicative of background/urban fill and not a spill or release.

As shown in Table 4a, concentrations of metals were reported at levels below Commercial SCOs except copper in the sample from just above the field identified water table in MW-104 (6.3 – 6.9 ft bls). The concentration of copper (783 ppm) in this sample exceeded its Commercial SCO of 280 ppm. Lead was also reported in this same sample at a concentration of 611 ppm, which exceeded its POG SCO of 450 ppm. Similar to the distribution of SVOCs, the metals data suggest that soils impacted by metals are located at relatively shallow depths in the vicinity of the former western portion of the original shopping center.

In July 2015, Stantec oversaw the advancement of eight additional soil borings located in the vicinity of, and surrounding, MW-103 and collected soil samples from those borings. This work was undertaken on behalf of A&P to delineate CVOCs in soils. It is important to note that, as described above, this work corresponded with the time period that A&P declared bankruptcy and so those results were not described or submitted in previous reports. These soil borings are identified herein as GP-1 to GP-8 and the results are included in Table 4a and shown on Figure 5A. In general, the results show PCE at levels exceeding POG SCOs in the samples corresponding to just above the

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[1] Azzolina, N.A. et al. October 19, 2016. Background concentrations of PAHs and metals in surface and subsurface soils collected throughout Manhattan, New York.

Mass DEP. May 2002. Background levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil.

field-identified water table. AT GP-6, benzene and additional CVOCs (i.e., TCE, cis-1,2-DCE, and trans-1,2-DCE) were detected at levels exceeding Protection of GW SCOs.

From 2012 to 2015, GEI conducted an investigation of MGP-related residuals in the southeastern portion of the Site that included soil borings, soil sampling, and monitoring well construction and sampling. Soil samples were collected from various depth intervals from 18 borings and analyzed for VOCs, SVOCs, Target Analyte List (TAL) metals and mercury, and total and free cyanide. Copies of GEI's soil quality analytical tables are presented in Appendix B. Locations of the borings that had concentrations of contaminants above SCOs are shown on Figure 5B.

The GEI soil quality data indicated there were no CVOCs reported above either POG or Commercial SCOs. BTEX compounds (i.e., benzene, ethylbenzene, toluene, and xylene), however, were reported at concentrations exceeding POG SCOs but below Commercial SCOs in samples collected from two borings (B-104 at depths of 9 to 10 feet bls and B-107 at depths of 8.5 to 12 feet bls).

PAHs in soils were reported above POG SCOs in samples collected from four borings (B-104, B-107, B-110, and B-111) in 2012. Concentrations of Total PAHs ranged from 50 ppm at B-111 to 1,300 ppm at B-107. The sample depths at which these elevated levels were reported typically ranged from 7 to 12 feet bls. At B-110, however, Total PAHs were reported at 208 ppm at a depth interval of 1 to 3 feet bls. When compared to the published background data, the types and concentrations from the GEI borings show higher concentrations (and higher percentages) of naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene than in the background samples. This suggests the PAHS reported in soils in the eastern portion of the Site are not indicative of background/urban fill.

MGP-related source material at the Site is limited to the area immediately surrounding monitoring well MW-1. Tar-coated to tar-saturated soils were limited to depths between 9 and 14 feet bls at the two borings located immediately east and west of monitoring well MW-1 (B-104 and B-107, respectively). Physical impacts in borings to the north and northeast of monitoring well MW-1 were limited to soil staining and naphthalene-like odors. Physical impacts east of B-107 were limited to naphthalene-like odors at MW-110S. Borings located south of monitoring well MW-1 and east of borings B-107 and MW-110S did not exhibit any physical impacts.

Total cyanide was reported at B-110 at 127 ppm, which exceeded both its POG (40 ppm) and Commercial Use SCO (27 ppm). See Appendix B and Figure 5B. In 2015, GEI conducted additional soil borings and sampling in the vicinity of B-110 to further delineate the extent of Total cyanide that exceeded SCOs. Four borings, identified as B-115 to B-118, were advanced north, south, east, and west of B-110. The results showed levels of total cyanide were below SCOs in the borings to the north, west, and south (B-115, B-116, and B-118). Total cyanide at B-117 was reported above its SCO at 103 ppm.

3.1.2 Groundwater

Groundwater samples collected from temporary wells installed in several of the MPI 2000/2001 borings had concentrations of VOCs and base neutral compounds at levels that exceeded New York State Ambient Water Quality Standards and Guidance Values (AWQSGVs). The highest detected VOC levels were observed in the western half of the front parking lot area and included PCE, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride (VC).

In March 2003 and June 2004, groundwater samples were collected from monitoring wells by Whitestone. Well locations are shown on Figures 2, 3, and 6. Results are presented in Appendix A. The groundwater sample analytical results showed concentrations of CVOCs, BTEX, and SVOCs at levels exceeding AWGSGVs at MW-2, MW-4, and MW-4D; and BTEX and SVOCs above AWQSGVs at MW-6. In the southeastern portion of the Site, BTEX and SVOCs were reported above AWQSGVS in MW-1 only. A dense non-aqueous phase liquid (DNAPL), or free product, related to coal tar/MGP residuals, was also observed, or measured, during the installation and sampling of MW-1.

In August 2007, another round of groundwater samples was collected from the eleven Site wells. The results from this event were similar to previous results.

In March 2012, groundwater sample results were collected by Stantec from temporary wells located inside the Citibank, Ciros Pizza, and Liquor and Wine Warehouse. These temporary wells are identified as SVP-6, SVP-11, and SVP-9, respectively. Locations are shown on Figures 2A and 6. Exceedances of AWQSGVs are presented on Table 5a. Spider Maps depicting exceedances of AWQSGVs are presented as Figures 6A and 6B.

As shown on Table 5a and Figure 6A, VOCs were detected in each of the three interior samples. At SVP-6 (in the Citibank), exceedances of AWQSGVs were reported for ethylbenzene (12 micrograms per liter or ug/L) and VC (2.2 ug/L). At SVP-11 (in Ciros Pizza), exceedances of AWQSGVs were reported for only PCE (6.1 ug/L). At SVP-9 (in the Liquor Warehouse), exceedances of AWQSGVs were reported for cis-1,2-DCE (7.1 ug/L), ethylbenzene (320 ug/L), isopropylbenzene (46 ug/L), o-xylene (170 ug/L), and toluene (41 ug/L). Reportable levels of CVOCs (PCE and breakdown products) were detected in each sample, with only PCE (6.1 ug/L at SVP-11) and VC (2.2 at SVP-6) being reported above AWQSGVs. Total CVOC concentrations were 12.6 ug/L at SVP-6, 14.7 ug/L at SVP-11, and 12.8 ug/L at SVP-9. Total BTEX concentrations were 14.1 ug/L at SVP-6, 4.8 ug/L at SVP-11, and 599 ug/L at SVP-9.

As shown in Table 5a, concentrations of SVOCs were reported at levels exceeding AWQSGVs in each of the three interior samples (see Table 5a). At SVP-6, exceedances of AWQSGVs were reported for acenaphthene (67 ug/L), benzo(b)fluoranthene (0.26 ug/L), and indeno(1,2,3-cd)pyrene (0.15 ug/L). At SVP-11, exceedances of AWQSGVs were reported for acenaphthene (110 ug/L), benzo(a)anthracene (0.96 ug/L), benzo(b)fluoranthene (0.65 ug/L), and indeno(1,2,3-cd)pyrene (0.15 ug/L). At SVP-9, fourteen of the PAH analytes were reported at levels exceeding AWQSGVs.

As mentioned above, in 2012 Stantec conducted investigation work in the western portion of the Site that included a MIP survey followed by monitoring well construction and sampling. Locations of the MIP borings (MIP-1 to MIP-11) and monitoring wells (MW-101 to MW-107S) are shown on Figure 2. Laboratory analytical results for the groundwater monitoring wells are presented in Table 5b. Spider maps depicting exceedances of AWQSGVS are presented on Figure 6A and 6B.

As shown on Table 5b and Figure 6A, CVOCs were reported at concentrations exceeding AWQSGVs at four shallow wells (MW-4, MW-5, MW-104S, and MW-106S), and BTEX compounds above AWQSGVs at six shallow wells (MW-2, MW-5, MW-6, MW-102S, MW-105S, and MW-106S) and two deep wells (MW-4D and MW-102D). At the remaining wells, VOCs were reported at levels below AWQSGVs or below laboratory detection limits. The horizontal distribution of CVOC and BTEX exceedances appears to be within, or downgradient of, the former western portion of the original shopping center. The vertical distribution appears to be primarily in the shallow water table zone, with the exception of BTEX compounds above AWQSGVs in two deep wells, MW-4D and MW-102D.

Similarly, as shown in Table 5b and Figure 6A, SVOCs (primarily PAHs) were detected at levels exceeding AWQSGVs in eight shallow wells (MW-2, MW-4, MW-5, MW-6, MW-102S, MW-105S, MW-106S, and MW-107S). Elevated total SVOCs, at levels ranging from 358 to 679 ug/L, were reported in shallow wells MW-4, MW-6, MW-102S, and MW-105S. At these four shallow wells, concentrations of naphthalene ranged from 240 to 410 ug/L, which accounted for 60% to 80% of the total PAHs. As shown on Figure 4, groundwater is shown to flow from southwest to northeast across the entire Site. In the western portion of the Site, wells MW-2 and MW-6 along Beach Channel Drive are depicted as downgradient, in the eastern portion of the Site, well MW-8 along Wainwright Court is depicted as downgradient. Due to reported levels of PAHs exceeding AWQSGVS in shallow wells MW-2 and MW-6, delineation in this downgradient area of the Site along Beach Channel Drive is not achieved. However, delineation is shown at downgradient well, MW-8, located near Wainwright Court.

SVOCs at levels exceeding AWQSGVs were reported in only two deep wells (MW-4D and MW-102D). At each of these two deep wells, naphthalene was reported at 1,500 and 440 ug/L, which account for 93% and 87% of total SVOCs in these wells. Like VOC impacts, the distribution of exceedances appears to be within, or downgradient of, the former western portion of the original shopping center.

The groundwater quality data from the eastern portion of the Site, collected by GEI are presented in Appendix B. Exceedances of AWQSGVs are shown on Figure 6B. As shown on Figure 6B, there were no CVOCs reported above AWQSGVs. BTEX compounds, however, were reported at concentrations exceeding AWQSGVs from samples collected during the drilling of boring B-106, via discrete sampling methods, and from samples collected from corresponding monitoring well MW-108S. The highest levels of total BTEX at this location (9,740 ug/L) were reported at a depth interval of 12 to 16 feet bls. Groundwater samples collected from 38 to 40 feet bls were reported at 42 ug/L for Total BTEX, indicating decreasing concentrations with depth. BTEX compounds were reported at levels below standards at the B-105 and B-109 locations (discrete sampling methods) and at MW-109S and MW-110S.

PAHs in groundwater samples collected by GEI were reported below AWQSGVS in samples collected at the B-109, MW-109S, and MW-110S locations (see Appendix B). As shown on Figure 6B, PAHs were reported above AWQSGVS from samples collected via discrete sampling methods from two temporary groundwater probes at the B-105 and B-106 locations as well as from low-flow samples collected from monitoring wells MW-1 and MW-108S. MW-108S was installed in the same location as temporary groundwater probe B-106. At the B-106 location, total PAHs were reported at each of the four discrete sampling intervals as follows:

Sampling Interval	Total PAHs (ug/L)	Naphthalene (ug/L)
5 to 9 feet	111	79
12 to 16 feet	8,890	7,400
18 to 22 feet	950	850
36 to 40 feet	22	22

Concentrations of naphthalene accounted for 71% to 100% of the total PAHs in the four sampling intervals from B-106. Samples collected from monitoring well MW-108S, which is screened from 5 to 20 feet bls in the same location as temporary groundwater probe B-106, had Total PAHs reported at 1,650 ug/L (with 1,895 ug/L in the associated QA/QC Duplicate sample), with naphthalene at 1,300 ug/L (79% of the total; with 1,500 ug/L in the associated QA/QC Duplicate sample). The data indicate the highest levels of impacts are in the top 20 feet of groundwater (located from 5 to 25 feet bls), and in the vicinity of MW-1.

As described further in Section 3.2.3 below, groundwater from MW-1 was also sampled by GEI at the request of the NYSDEC on November 11, 2020, three months after removal of the DNAPL in the well on August 11, 2020. Results are presented in Appendix B. The groundwater results were compared to the historic sampling conducted by Whitestone from 2003-2008. The samples collected post removal in November 2020 are significantly lower than the historic average concentrations prior to DNAPL removal as shown below.

Sampling Date(s)	Total PAHs (ug/L)	Total BTEX (ug/L)
2003-2008 Historic Average	8,133	7,313
11/11/2020 Post Removal	4,580	3,580

Similar to the soil analytical results, total cyanide concentrations in temporary probes were highest at shallow intervals and generally decreased with depth. North of MW-1, total cyanide was detected above the standard in two samples collected at B-106 at depths of 5-9 ft bls (940 ug/L) and 12-16 ft bls (830 ug/L); and cyanide was detected in sample B-109 (6-10 ft bls) at 1,300 ug/L, above the NYS AWQSGV (200 ug/L) (see Figure 6B).

Cyanide was also detected in samples collected from monitoring wells MW-108S, MW- 109S, and MW-110S. Cyanide concentrations were above the NYS AWQSGV in samples MW-108S and MW-

110S. The highest concentrations in groundwater were detected in temporary groundwater probe B-106 and confirmed in monitoring well MW-108S north of the MGP impacts observed near MW-1

In January 2018, Stantec resampled six wells that (in 2012) showed detections of chlorinated hydrocarbons and/or were close to the original source area. These wells are identified as MW-4S, MW-4D, MW-5, MW-104S, MW-104D, and MW-106 and were sampled for both VOCs and SVOCs. The 2018 results are presented in Table 5b and on Figure 6A, along with the 2012 results, as a means to compare the two data sets. In general, the levels of CVOCs and BTEX compounds showed a decrease in concentrations at each of the six wells. Especially PCE, which decreased from 310 to 5.1 ug/L at MW-4 and from 23 to 5.8 ug/L at MW-104S. An exception to this trend is shown for cis-1,2-DCE and VC at MW-4. These two compounds increased in concentrations, from 220 to 340 ug/L and from 47 to 110 ug/L, respectively. The data indicate that PCE continues to degrade to its breakdown products.

The January 2018 groundwater results show a decreasing trend in SVOCs at each of the six sampled wells (see Table 5b). SVOCs were reported at levels below AWQSGVs at each well except naphthalene (770 ug/L) at MW-4D. The levels of naphthalene at this well, although showing a decrease from 2012, still accounted for 92% of the total SVOCs in this well.

In August 2020, Stantec collected additional samples from nine monitoring wells (MW-2, MW-2D, MW-3, MW-4S, MW-4D, MW-5, MW-104S, MW-104D, and MW-106) for VOCs. Results are presented in Table 5b and Figure 6A. The groundwater sample results from August 2020 (as presented in Table 5b) continue to show levels of CVOCs above AWQSGVS at MW-4, MW-5, and MW-104S. Total CVOC concentration contours from the August 2020 event are also shown on Figure 7A. The overall data show that highest concentrations of CVOCs continue to be reported at well MW-4, which is located within the area of the 2008 HRC injection and closest to the apron of the Liquor Store. Total BTEX concentrations from the August 2020 event are also posted on Figure 7B. The highest concentrations are shown in two deep overburden wells (48.5 ug/L at MW-4D and 15.6 ug/L at MW-104D). Levels at a downgradient deep well (MW-2D) were reported as non-detect. Due to the sporadic nature of the concentrations, it is difficult to present concentration contours.

In August 2020, groundwater samples were also collected from three wells (MW-2, MW-3, and MW-4) and analyzed for 1,4-dioxane and PFAS compounds. The August 2020 sample results for 1,4-dioxane and PFAS compounds are presented in Table 5d. In March 2024, AWQSGVs were established for 1-4-dioxane and two PFAS compounds [perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA)]. The AWQSGVs are presented in Table 5d and as shown in this table, 1,4-dioxane was not detected in any of the samples. PFAS compounds were detected in each sampled well. Total PFAS levels were 388.6 nanograms per liter (ng/L) at MW-2, 168.0 ng/L at MW-3 (with 170.9 ng/L in the QA/QC Duplicate sample), and 228.5 ng/L at MW-4. PFOS was reported above its AWQSGV of 2.7 ng/L at each of the three wells at concentrations ranging from 22.9 ng/L at MW-4 to 52.2 ng/L at MW-2. PFOA was also reported above its AWQSGV of 6.7 ng/L at each of the three wells at concentrations ranging from 22.9 ng/L at MW-4 to 52.2 ng/L at MW-

2. PFOA was also reported above its AWQSGV of 6.7 ng/L at each well at levels ranging from 21.3 ng/L at MW-3 to 33.4 ng/L at MW-2.

3.1.3 SUB-SLAB SOIL VAPOR AND INDOOR AIR

In June 2004, Whitestone collected sub-slab soil vapor samples for VOC analyses by Method TO-15 from four locations (identified as SV-1 to SV-4 on the figure in Appendix A). As shown on the data table in Appendix A, PCE soil vapor concentrations were reported at levels ranging from 3,800 micrograms per cubic meter (ug/m^3) at SV-1 to 160,000 ug/m^3 at SV-3, and TCE at levels ranging from non-detect at SV-3 and SV-4 to 440 ug/m^3 at SV-2. Whitestone surmised that these soil gas vapor concentrations may relate to localized shallow soil anomalies identified by MPI but may more likely correspond to downward vapor migration through floor cracks or openings from the poorly vented dry cleaners to the vadose (or unsaturated) zone.

On June 11, 2008, six soil vapor samples (identified as SG-1 to SG-6 on the figure in Appendix A) were collected by Whitestone from locations around the perimeter of the property and submitted for VOC analyses by Method TO-15. Results (see copies of data tables in Appendix A) showed the highest concentrations of PCE at location SG-1 (210 ug/m^3), which was located in the sidewalk to the north of the Citibank unit. PCE levels at the remaining five soil gas vapor locations ranged from non-detect at SG-3 to 18 ug/m^3 at SG-5. TCE was reported at 32 ug/m^3 at SG-1 and at non-detect levels at the other five locations. Whitestone also collected indoor air quality (IAQ) samples from the former dry cleaner unit (IAQ-1) and from the adjacent Ciros Pizza (IAQ-2) for VOC analysis by Method TO-15. A third exterior air sample (IAQ-3) was located outside near the rear door and analyzed for TO-15. The tabulated results (Appendix A) identified PCE concentrations at 310 ug/m^3 and 6.8 ug/m^3, respectively, in IAQ-1 and IAQ-2. The IAQ-1 sample result of 310 ug/m^3 exceeded the New York State Department of Health (NYSDOH) air guidance value of 100 ug/m^3. TCE was reported as non-detect in both indoor air samples.

Based on the levels of PCE reported in the sub-slab gas and indoor air samples, Whitestone recommended that a sub-slab depressurization system (SSDS) be installed in the former Bell Boy dry cleaner unit. As described further in Section 3.2.2 below, this work, which included excavating impacted soils from below the slab, installing slotted PVC piping below the slab and solid PVC piping on the exterior wall, and installing a radon fan, was conducted by Stantec from 2011 to 2013. Note the former Bell Boy unit is now currently known as Sofias Nail Salon (see Figure 2).

On March 11 and 20, 2012, Stantec collected sub-slab vapor and indoor air quality samples from the Citibank (SVP-6, IA-6, and IA-7), Ciros Pizza (SVP-11 and IA-11), Sofia's Nail Salon (IAQ-1 and IAQ-2), and vacant unit (SVP-9, SVP-10, IAQ-9 and IAQ-10). Locations are shown on Figure 2A, and analytical results are presented in Figure 6a. These samples were collected approximately 12 weeks after the installation and continuous operation of the SSDS.

As shown on Table 6a, concentrations of CVOCs were detected in each of the SVP, IAQ, and ambient air samples. Concentrations of TCE were reported in sub-slab samples in Ciros Pizza (2.9 ug/m^3 in SVP-11) and in the vacant unit (0.18 ug/m^3 in SVP-9 and 3.8 ug/m^3 in SVP-10).

Concentrations of PCE were reported in the Citibank (1.0 ug/m^3 in SVP-6), Ciros Pizza (160 ug/m^3 in SVP-11), and in the vacant unit (21 ug/m^3 in SVP-9 and 48 ug/m^3 in SVP-10).

The 2012 sub-slab results suggest an overall decrease in sub-slab vapor levels from the 2004 levels. This may be due to a combination of several years of degradation as well as the positive effects from source material/impacted soil excavation from the former dry cleaner and SSDS installation in December 2011.

Results of the March 2012 IAQ samples (Table 6a) also show levels of CVOCs in each sample. Although no detections of TCE were reported in any of the IAQ samples, PCE was reported at levels of approximately 1.0 ug/m^3 in the Citibank, 0.45 ug/m^3 in Ciros Pizza, 3 ug/m^3 in Sofia's Nail Salon, and approximately 5.0 ug/m^3 in the Vacant Unit. Each of these results is well below the NYSDOH guidance value of 30 ug/m^3 for PCE. As described above, two IAQ samples collected in 2008 from the subject unit and from Ciros Pizza had reported concentrations of PCE at 310 ug/m^3 and 6.6 ug/m^3, respectively. The 2012 IAQ results indicate a decrease in PCE of about 99% (from 310 ug/m^3 to 3 ug/m^3) in the subject unit and 93% (from 6.6 ug/m^3 to 0.45 ug/m^3) in Ciros Pizza. Again, this decrease may be a result of several years of degradation occurring under the sub-slab as well as the positive effects from source material excavation and SSDS installation in December 2011.

Stantec also evaluated the March 2012 sub-slab and IAQ results in accordance with Section 3.4 (Decision Matrices) of the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006 revised May 2017). The Decision Matrices are another way to compare sub-slab vapor with indoor air concentrations in order to develop recommended actions. Stantec's evaluation resulted in placing the Citibank, Ciros Pizza, and Vacant Unit in No Further Action categories.

In January/February 2014, the vacant unit was renovated into a retail liquor store (Liquor Warehouse) and due to the renovation the two sub-slab probes (SVP-9 and SVP-10) that were installed in March 2012 were no longer viable. Therefore, Stantec replaced these two probes on March 18, 2014. On March 25, 2014, Stantec then collected additional sub-slab vapor and IAQ samples from the Ciros Pizza, Sofia's Nail Salon, and vacant/Liquor Warehouse units. Note that the SSDS was turned off on March 18, 2014 (seven days before collecting the additional samples).

The analytical results from the March 2014 event are presented in Table 6b. The sampling locations are shown on Figure 2A.

As shown on Table 6b, concentrations of VOCs were again detected in each of the sub-slab soil gas (SSSG), IAQ, and ambient air samples. The highest concentration reported was for acetone in the indoor air sample from within Sofia's Nail Salon (16,000 ug/m^3 at IAQ-1). This high concentration is likely due to the products (nail polish, hair spray, etc.) being used in this business. In terms of the contaminants of concern, levels of TCE were reported in sub-slab samples in Ciros Pizza (0.56 ug/m^3 in SVP-11), Sofia's Nail Salon (0.52 ug/ m^3 in SVP-102), and in the Liquor Warehouse (2.5 ug/m^3 in SVP-9 and 1.0 ug/m^3 in SVP-10). Concentrations of PCE were reported in Ciros Pizza

(34 ug/m^3 in SVP-11), in Sofia's Nail Salon (140 ug/m^3 in SVP-102), and in the Liquor Warehouse (8.8 ug/m^3 in SVP-9 and 14 ug/m^3 in SVP-10). The March 2014 results indicate decreasing levels of PCE and TCE in sub-slab soil gas compared to the March 2012 results.

Results of the March 2014 IAQ sample data (Table 6b) also show levels of CVOCs in each IAQ sample. Similar to the March 2012 event no detections of TCE were reported in any of the IAQ samples. PCE was only reported at levels of 0.67 ug/m^3 in Ciros Pizza and 0.94 ug/m^3 in the Liquor Warehouse. PCE was not detected in the indoor air sample (IAQ-1) from Sofia's Nail Salon. Each of these results is well below the guidance value of 30 ug/m^3 for PCE. The March 2014 results generally indicate decreasing levels of PCE in indoor air compared to the March 2012 results.

Stantec also evaluated the March 2014 SSSG and IAQ results in terms of NYSDOH Decision Matrices. This evaluation again resulted in placing the Citibank, Ciros Pizza, and Liquor Warehouse Unit in No Further Action categories.

The March 2014, SSSG and IAQ results indicated a continuing decreasing trend in sub-slab vapor and indoor air levels. Again, this decrease may be a result of several years of degradation occurring under the sub-slab as well as the positive effects from source material excavation and SSDS operation since December 2011.

In April 2015, GEI conducted a vapor intrusion investigation in the grocery store. Results are presented in Table 6c. Soil gas samples were collected from three temporary sub-slab vapor points (SV-101 to SV-103) and from three indoor air locations (IA-101 to IA-103). These locations are shown on GEI's Figure 1, dated May 2015, in Appendix B. The results indicated low levels or non-detect levels of PCE and TCE at the SV-101/IA-101 and SV-102/IA-102 locations, placing these two locations in No Further Action categories. For the April 2015 sampling event, levels of PCE were reported in SV-103 at 115,000 ug/m^3 and in IA-103 at 1.57 ug/m^3, placing this location within action Category 7 (Mitigate). As described in the 2021 RIR, GEI compared the indoor air concentrations with NYSDOH Background Indoor Air Concentrations and determined that levels of naphthalene and BTEX compounds in indoor air were below the NYSDOH Background Indoor Air Concentrations indicating that soil vapor intrusion of compounds related to the former MGP residuals in soil and groundwater does not appear to be occurring in the eastern portion of the Site.

Due to the bankruptcy proceedings, little work was conducted at the Site in 2015, so Stantec recommended that re-sampling at the IA-103/SV-103 location be conducted. Since the property owner required that GEI remove and restore the locations at each location under the access agreement for sampling in 2015, each of the three temporary sub-slab soil gas points that GEI installed were removed after the sampling in April 2015. Therefore, re-sampling at the SV-103 location required installing a permanent sub-slab gas point (SSGP). This work was conducted by Stantec in January 2018. The permanent SSGP at SV-103 was sampled along with the collection of a single indoor air sample at the same location.

The January 2018 results, also presented in Table 6c, were similar to GEI's 2015 data as elevated levels of PCE (>100,000 ug/m3) were detected in the SV-103 sub-slab soil gas sample. Levels of PCE in the indoor air (1.6 ug/m3) were also similar to the levels detected in 2015 (1.57 ug/m3). Although the indoor air levels were well below the NYSDOH Standard of 30 ug/m3, evaluating the sub-slab and indoor air values to the Decision Matrices further indicated that mitigation was necessary. It is interesting to also note that the concentration of PCE in the ambient/outside air sample (collected on the western portion of the property near the post office building) was reported greater than the indoor air sample at 3.7 ug/m3.

In August 2020, Stantec conducted additional Vapor Intrusion (VI) work, in accordance with the NYSDEC approved Interim Remedial Measures (IRM) - VI Remedial Action Work Plan (RAWP). This work included installing additional sub-slab soil gas probes inside the grocery store (identified as SVP-201 and SVP-202) and in the apron in front of the store (SVP-203 and SVP-204) and installing two replacement probes (SV-101 and SV-104) inside the nail salon unit (See Figure 2A). The work also included collecting sub-slab vapor and indoor air samples.

The August 2020 results (Table 6d) showed that sub-slab vapor for PCE was elevated in the subsurface soil outside, and underlying the slab of, the grocery store building suggesting that the former dry cleaner of the original shopping plaza building footprint has contributed to impacts at least to groundwater if not soil.

Stantec has continued to collect VI samples from the same locations in March 2022, March 2023, and March 2024. Results are presented in Tables 6e, 6f, and 6g, respectively. A Spider Map showing the results from 2020 to 2024 is presented as Figure 8. Please note that only those VOCs that have an associated Matrix value and had detected concentrations are show. For instance, although 1,1,1-trichloroethane is included in Matrix B it has always been reported as non-detect and so it is not shown on Figure 8. The overall data for the indoor air quality testing identified that, although the potential for vapor intrusion is present, there is no significant indoor air quality impacts at the grocery store, the liquor store, the pizza restaurant, or the bank related to CVOCs. Other volatile organic compounds exist in air and soil vapor but are not likely from the dry cleaner release. The indoor air quality within the former Bell Boy Cleaners space (currently occupied by Sofia Nails) is mitigated by the operation and performance of the SSDS. Evaluating the results in terms of the Decision Matrices indicates that, due to levels of PCE and TCE in sub-slab vapor in the grocery store (SVP-103) and the apron (SVP-203 and SVP-204), mitigation is necessary.

3.2 SUMMARY OF INTERIM REMEDIAL MEASURES

3.2.1 In-Situ Injections

Elevated concentrations of PCE and TCE were detected in groundwater samples collected by Whitestone in monitoring well MW-4. The data suggested these contaminants were from chlorinated solvents from dry cleaning activities/compounds at a former dry cleaner that had been in the previous western portion of the building and that an injection of Hydrogen Release Compound (HRC©) was recommended as a remedial measure.

On June 15, 2008, an injection of HRC© was conducted in the vicinity of MW-4/MW-4D, in accordance with Whitestone's August 2004 Supplemental Remedial Investigation Report & Remedial Investigation/Corrective Action Workplan, Whitestone's August 2007 and October 2008 correspondence, and NYSDEC's May 2008 approval letter. A total of 15 temporary injection points were installed in a grid pattern around MW-4/MW-4D (see Figure 2). Each point was installed to a depth of 12 feet bls. At each point, five pounds of HRC© were injected per vertical foot from depth intervals of 6 to 12 ft. bls (for a total of 30-lbs per point). Post-injection groundwater samples were subsequently collected by Whitestone on July 15 and October 16, 2008 (30 days and 90 days after injection) from MW-4 and MW-4D. The results showed a decrease in concentrations of PCE in MW-4 (from >1000 ug/L to 460 ug/L). An increase in concentrations of PCE breakdown products (TCE, cis-1,2-DCE, and VC) further suggested the HRC© had been effective in breaking down the CVOCs. PCE concentrations at MW-4 in samples subsequently collected by Stantec were reported at 310 ug/L (June 2012), 5.1 ug/L (January 2018), and 47 ug/L (August 2020). The overall water quality data indicate decreasing CVOC concentrations in MW-4.

3.2.2 Sub-Slab Depressurization System

Based on the historical soil, sub-slab vapor, and indoor air quality data collected by both Whitestone and Stantec from the former Bell Boy Cleaners unit (which is now doing business as Sofias Nail Salon) located in the northern portion of the current building, Stantec conducted interim remedial measures in this unit from 2011 to 2013. The work was conducted in accordance with the NYSDEC approved IRM Work Plan, submitted by Stantec on December 1, 2011. The work included cutting through the concrete slab, excavating approximately 30 cubic yards of soil underlying the slab, and installing a sub-slab depressurization system (SSDS) in late December 2011. The SSDS consists of slotted (20-slot) 4-inch diameter PVC piping installed below the slab that is connected to solid 4-inch diameter PVC piping that extends along the outside wall to above the roof line. A radon fan (Fantech Model FR-200) is located on the exterior piping. The fan draws vapor from beneath the slab through the slotted and solid piping and vents the vapor to above the roof line. The exhaust is located at least 10-feet from any adjoining or adjacent building heating, ventilation, and air conditioning (HVAC) intakes.

After the SSDS was installed, Stantec then conducted post-installation monitoring that included pressure tests to verify that adequate negative pressure (i.e., vacuum) was being maintained beneath the slab and that the system manometer was showing a negative pressure. Sub-slab soil gas and indoor air samples were also collected in March 2012. Due to damage caused by Hurricane Sandy in October 2012, repairs to the SSDS were conducted in January 2013. A report, entitled Interim Remedial Measures – Construction Completion Report (IRM-CCR), dated June 28, 2013, was subsequently submitted by Stantec for NYSDEC review and comment on July 2, 2013.

Based on NYSDEC comments and requirements, additional work was conducted by Stantec in October 2013. This work included installing four additional SSSG probes within the Sofia's Nail Salon unit (identified as SV-101 to SV-104 on Figure 2a), conducting quantitative differential pressure field readings on all of the SSSG probes in the various lease units to document the SSDS range of influence, and conducting an evaluation of the air quality/emissions from the SSDS discharge stack to determine whether the emissions were meeting air quality standards.

The results, which were submitted to NYSDEC in an Addendum to Interim Remedial Measures-Construction Completion Report in January 2014, indicated that the SSDS was creating a vacuum beneath the entire slab at the Sofia's Nail Salon unit, which extended to the Ciros Pizza unit and Citibank unit to the north and to the Liquor Warehouse to the south. Based on the data the range of influence of the operating SSDS was estimated at 50 feet. The results also indicated that there were no compounds in the stack emissions that exceeded Annual Guideline Concentrations or Short-term Guideline Concentrations. NYSDEC subsequently approved the IRM-CCR on March 11, 2014.

Stantec has conducted Operation Maintenance and Monitoring (OM&M) inspections of the SSDS since the system has been operating. These inspections include inspecting the SSDS, field testing the sub-slab soil gas probes in each store unit to evaluate vacuum conditions, replacing any probes as required, and collecting sub-slab vapor and indoor air samples from select units. The inspections consistently showed that the SSDS is operating as intended and installed and that the system continues to create a vacuum that extends from beneath the Sofia's nail Salon to the Citibank unit (to the north) and the Liquor Warehouse (to the south). The data also indicate the influence extends to the front portion of the Stop & Shop store. Based on these data, the range of influence of the operating SSDS is estimated at approximately 50 to 75 feet.

3.2.3 Groundwater – DNAPL Removal Southeastern Area

On May 28 and June 11, 2008, Enhanced Fluid Recovery (EFR) activities were conducted in MW-1, located in the southeastern portion of the Site. During these EFR events, 750 and 800 gallons of liquids, respectively, were pumped from MW-1. Post-EFR groundwater samples collected on October 16, 2008, continued to show levels of BTEX and SVOCs above AWQSGVS in MW-1 and below Standards in MW-7, MW-8S, and MW-8D. A subsequent gauging event conducted by NYSDEC and Whitestone at MW-1 on December 18, 2008, continued to show the presence of DNAPL product in this well.

From August 2020 to July 2021, GEI conducted an evaluation of the recovery of DNAPL associated with MGP-related residuals at the Site. The work was conducted in accordance with a NYSDEC approved work plan dated April 2, 2020, and the requirements of the BCP and the access agreement between National Grid and Ahold. The evaluation was conducted of potential source material removal options for the DNAPL that was present at monitoring well MW-1. The DNAPL in the well at the Site is a potential source of groundwater impacts and the removal of the DNAPL will likely decrease the dissolved phase contribution to groundwater quality at the Site as part of the overall Site remedy.

On August 11, 2020, GEI began the field evaluation with a fluid gauging event to collect baseline depth to water, depth to DNAPL, and depth to well bottom using an electronic interface probe. During the pre-test evaluation of the well, a total of 1.65 feet of DNAPL was recorded. Since the

DNAPL in the well had not been removed or disturbed for several years prior to the test, this thickness was recorded as the pre-test equilibrium condition.

GEI conducted a standard baildown test of the DNAPL present in MW-1 on August 11, 2020, to remove DNAPL from the well and sand filter-pack. Approximately 1.25 gallons of DNAPL was removed from the well. During the removal, an electronic interface probe was used to gauge remaining DNAPL in the well. Removal continued until there was no measurable DNAPL observed in the well using the electronic interface probe. A weighted tape was then used to confirm that all DNAPL was removed from the well.

Immediately following the removal of the DNAPL in the well and sand filter pack, periodic measurements were conducted using an electronic interface probe for 7 hours. No measurable DNAPL was observed on the first day of the test. After 7 hours, two pressure transducers were placed in the well to monitor DNAPL recovery and the groundwater elevation. A barometric pressure transducer was also placed within the road box to measure surface barometric pressure during the test.

Periodic measurements were conducted using an electronic interface probe following the installation of the pressure transducers. Measurements were conducted through the first day of the test, then daily for a week, monthly for two months, and then periodically through July 9, 2021. The field data measurement form is included in Appendix A. No measurable DNAPL was observed in the well during the 331 days following removal of the DNAPL on August 11, 2020. Based on the lack of recovery of measurable DNAPL over the testing period, the DNAPL present at the Site does not exhibit the physical properties of a mobile DNAPL and is not hydraulically recoverable.

In an email to NYSDEC, GEI recommended that the transducers be removed, the recovery testing ended, and monitoring for DNAPL continue on an annual basis. Based on the results of the testing program, GEI did not recommend active DNAPL recovery as part of the remedy. This was approved by NYSDEC in an email dated June 28, 2021.

As mentioned previously, groundwater from MW-1 was sampled by GEI at the request of the NYSDEC on November 11, 2020, three months after removal of the DNAPL in the well on August 11, 2020. The groundwater results were compared to the historic sampling conducted by Whitestone Associates from 2003-2008. The samples collected post removal in November 2020 are significantly lower than the historic average concentrations prior to DNAPL removal.

Sampling Date(s)	Total PAHs (ug/L)	Total BTEX (ug/L)
2003-2008 Historic Average	8,133	7,313
11/11/2020 Post Removal	4,580	3,580

3.3 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of the physical, chemical, and biological processes that control the transport, migration, and actual and potential impacts of contamination (in soil, groundwater, air, surface water, or sediments) to sensitive receptors. The following subsections describe the relevant environmental setting, contaminants of concern, contaminant fate and transport, potential receptors, and exposure pathways to define the CSM and provide context to the proposed work plan. This CSM is based on the results of prior Site investigation work completed by Whitestone, Stantec, and GEI as presented in Section 3 of this work plan. While the contaminants of concern at the Property include metals, VOCs, PAHs, and PFAS in soil and/or groundwater, please note that this work plan addresses VOCs and PFAS in groundwater only.

3.3.1 Environmental Setting

The Site is located at 112-15 Beach Channel Drive, Belle Harbor (Queens), Queens County, New York (Figure 1). The property is identified further as Block 16166, Lot 434, and comprises approximately 5 acres (see Figure 2). The Site currently consists of a shopping center building encompassing approximately 57,000 square feet with tenant retail commercial operations, basically orientated north to south. The remaining 3.7 acres of the Site are paved parking. The shopping center is currently active and is occupied by a Stop & Shop Supermarket, Liquor Wine Warehouse, Sofia's Nail Salon (occupying the space which was formerly occupied by Bell Boy Dry Cleaners), Ciros Pizza, and a Citibank branch bank. A former portion of building, orientated east to west and was located on the western side of the current building. It is reported that a dry cleaner also operated in this former building.

Surface topography at the Site is generally flat and slopes gently to the north, with a ground surface elevation of approximately 10 feet above mean sea level (msl). No surface water or wetland areas were observed on-site during Stantec's field work. The nearest water body is Jamaica Bay, which is located approximately 300 feet to the north of the Site, across Beach Channel Drive.

Based on previous investigation data, soils encountered at the Site consisted of fill material (fine to coarse sand and gravel with pieces of coal fragments and concrete) from ground surface to approximately 5 to 6 feet bls. Underlying the fill, native soils encountered consisted of fine sand. Bedrock was not encountered in any of the borings drilled at this Site.

The water table has been measured at approximately 5 to 7 feet bls in the Site monitoring wells, with an inferred groundwater flow direction to the north-northeast at a horizontal gradient of approximately 0.004 feet/foot. Multi-level well pairs have been installed at the Property. Groundwater elevation data indicate that groundwater levels and flow in the shallow water table zone are not influenced by tidal action, but that levels and flow in the mid and deep overburden zones are. Groundwater in the shallow overburden is shown to flow to the north-northeast during both low and high tides. Groundwater in the mid-level overburden is shown to be somewhat radial in the center of the Site during both low tide and high tide. Water level elevations are also shown to rise approximately one to two feet from low to high tide. Groundwater in the deep overburden wells is shown to flow towards the north during low tide and towards the northeast during high tide. Water level elevation changes in the deep overburden wells are similar to the mid-level overburden wells, in that elevations rise about one to two feet from low to high tide. Vertical hydraulic gradients are shown to be downwards during low tide and upwards during high tide.

3.3.2 Contaminants of Concern

The following contaminants of concern have been identified for the Site based on the prior investigation work.

Soil – SVOCs were encountered in shallow soils at concentrations above NYSDEC SCOs in both the western and eastern areas of the Site. The levels of SVOCs, such as benzo(a) anthracene, benzo (b) fluoranthene, and chrysene, in the western area of the Site are more indicative of background/urban fill and not a spill or release, whereas the levels in the eastern area are more indicative of MGP-related source material.

CVOCs were also encountered in shallow soils at concentrations above SCOs in borings located in the western area only, within, or in the vicinity of, the former dry cleaner in the previous building. These borings include MW-103, GP-2, and GP-4 to GP-8. This area of the Site is shown on the various figures as the 2008 HRC injection area. Concentrations of CVOCs, primarily PCE, are reported in shallow soils at depths ranging from about 1.5 to 6.5 feet bls above POG SCOs. The highest concentrations appear to be at depths of 1 to 3 feet bls and decrease with depth. The soil quality data indicated there were no CVOCs reported above SCOs in borings located in the eastern area of the Stie.

BTEX compounds were reported at concentrations exceeding POG SCOs but below Commercial SCOs in samples collected from only one boring (GP-6 at a depth of 2.5 to 2.7 feet bls) located in the western area of the Site and from only two borings (B-104 at depths of 9 to 10 feet bls and B-107 at depths of 8.5 to 12 feet bls) in the eastern area of the Site. The historical data indicate no underground storage tanks (UST) at the Site.

Concentrations of cyanide were also reported in shallow soils (at depths of approximately 1 to 3 feet bls) in a small area located in the eastern portion of the Site, centered around a boring identified as B-110.

Groundwater – Based on the historical groundwater sampling, concentrations of SVOCs are reported above AWQSGVs in permanent monitoring wells located throughout the western area of the Site and in temporary wells that were located inside the current building within the Citibank, Ciros Pizza, and Liquor Warehouse units. Similar to the contaminants in soils, the SVOCs above AWQSGVs in this area of the Site are wide-spread and typically consist of benzo(a) anthracene, benzo (b) fluoranthene, and chrysene. The data suggest the impacts are due to the urban fill material. In the eastern portion of the Site SVOCs are also reported above AWQSGVs. These SVOCS consist of similar compounds (benzo(a) anthracene, benzo (b) fluoranthene, and chrysene) but also show naphthalene above AWQSGVs. In addition, DNAPL was observed in well MW-1 located in the eastern portion of the Site. The data suggest these impacts are more indicative of MGP-related source material.

Petroleum related VOCS, including BTEX compounds, are also reported above AWQSGVs in permanent monitoring wells located throughout the western area and the eastern area of the Site, and in temporary wells that were located inside the current building. As mentioned above, the historical data do not indicate an obvious, or usual source, of impact, such as a UST. Instead, the sporadic nature of BTEX compounds in groundwater may be a result of storm water running off into leaching-catch basins located throughout the parking lots. These leaching-catch basins, or storm drains, are designed to allow storm water to infiltrate through the bottom and into the underlying soils and groundwater.

CVOCs are reported above AWQSGVs only in four permanent wells (MW-4, MW-5, MW-104S, and MW-106S) and the three temporary wells (SVP-6, SVP-9, and SVP-11 located in the western area of the Sitey. PCE is reported above its AWQSGV in two wells (MW-4 located within the 2008 HRC injection area and MW-104S located sidegradient to this area). Concentrations of PCE in these two wells are showing an overall decreasing trend. PCE was also reported above AWQSGV in SVP-11, which was located inside the Ciros Pizza unit downgradient of the former Bell Boy Cleaners unit. PCE breakdown products including TCE, cis-1,2-DEC, and VC are also present at MW-4 and the downgradient monitoring wells. No CVOCs are reported above AWQSGVs in the eastern area of the Site.

Groundwater samples for PFAS compounds have been collected only once, in August 2023 from three monitoring wells, MW-2, MW-3, and MW-4. Concentrations of PFOS and PFOA were reported above AWQSGVs in all three wells.

Vapor – Based on the historical sub-slab soil gas and indoor air, concentrations of PCE were detected at elevated levels in sub-slab soil gas samples collected from the former Bell Boy dry cleaner's unit (now the Sofias Nail Salon) and the two units (Ciros Pizza and Liquor Warehouse) located adjacent to the Sofias Salon. These impacts are currently being remediated by the exiting sub-slab depressurization system installed and operating in the Nail Salon. PCE in sub-slab vapor is also reported in samples collected from inside the grocery store and from the apron just outside the grocery store. These areas are in close proximity to the 2008 HRC injection area. However, corresponding indoor air samples show no significant indoor air quality impacts at the grocery store, the liquor store, the pizza restaurant, nail salon, or the bank.

3.3.3 Contaminant Fate and Transport

Organic compounds, including petroleum-derived VOCs, CVOCs, and SVOCs may be readily degraded in the environment through volatilization, microbial activity, and other naturally occurring physical and geochemical processes. These contaminants can dissolve in groundwater to varying degrees depending on their individual solubility characteristics. Solubility also affects adsorption and desorption on soils and volatility from aquatic systems, as well as a contaminant's transformation by hydrolysis, photolysis, oxidation, reduction, and biodegradation in water. More soluble compounds, such as benzene, are more likely to leach from soil during precipitation events and enter groundwater than less soluble compounds, such as naphthalene. These contaminants may also volatilize from soil and groundwater into the atmosphere, and therefore can increase vapor intrusion risks.

Most petroleum products have a specific gravity of less than 1.0, and therefore are classified as light non-aqueous phase liquids (LNAPLs) which can accumulate or "float" on the capillary fringe of the water table where they can act as a continuing source of dissolved contamination to the underlying groundwater. Chlorinated VOCs have a specific gravity of greater than 1.0 and are classified as dense non-aqueous phase liquids (DNAPLs). Because of their relatively high density, these chemicals can sink through underlying permeable soils and groundwater to a more impermeable barrier. Once dissolved in groundwater, organic compound dispersion can occur through its migration with the advective flow of groundwater.

PCE undergoes degradation in the environment through a process called reductive dechlorination in which naturally occurring microbes break down PCE into daughter products that include TCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride. This process tends to occur more readily under anaerobic conditions.

PFAS compounds are a variety of man-made compounds typified by the presence of carbon-fluorine bonds. This bond is one of the strongest in nature and makes these chemicals highly resistant to degradation in the environment. Their unique chemical nature, being both oleophobic (oil resistant) and hydrophobic (water resistant) at the same time, make them useful in a wide range of manufacturing processes and as a component of many every-day commercial products. PFAS has been found to be widespread in the environment.

PFAS will bind to soil to some extent depending on the organic carbon content of the soil/sediment. However, due to their relatively high solubility, PFAS tend to leach from soil and migrate downward with infiltrating precipitation until they encounter the water table. Once at the water table, the compounds will migrate through advective transport, a mechanism that does not result in reduction of the plume concentration. However, dispersion may also occur as the plume migrates, reducing plume concentrations by making the plume larger. Diffusion of the plume along a concentration gradient can also occur in situations where the subsurface soil materials are of low permeability, such as clays or bedrock.

3.3.4 Potential Receptors and Exposure Pathways

The potential contaminant migration and exposure pathways for current and future likely receptors regarding impacted soil and groundwater that were considered as part of this investigation are discussed below.

Soil – The relatively shallow depth of impacted soils in the fill material suggests that Site workers excavating or digging at the Site (for utility repairs, etc.) could be at risk for exposure through direct contact of dermal absorption and/or incidental inhalation).

Groundwater – The relatively shallow depth to impacted groundwater suggests that Site workers excavating or digging at the Site could encounter impacted groundwater through direct contact of dermal absorption and ingestion.

Groundwater is not a source of potable water for the Site or surrounding properties

Air - Volatilization of volatile contaminants of concern from soil and groundwater comprises the inhalation exposure route. Due to the relatively shallow depths to impacted soils and groundwater, workers excavating or digging at the Site could be exposed through incidental inhalation of volatile contaminants of concern. The potential pathway of exposure through inhalation to people who work, or shop at the commercial lease units is from CVOCs migrating from subsurface sources to indoor air. However, as mentioned, this potential exposure route is currently being mitigated by the sub-slab depressurization system in the Sofias Nail Salon unit. Further, although elevated levels of PCE are reported in sub-slab vapor in the grocery store and the apron just outside the grocery store, air samples show no significant indoor air quality impacts at the grocery store.

4.0 SUPPLEMENTAL REMEDIAL INVESTIGATION OBJECTIVES

The objective of the SRIWP is to close specific data gaps in the Site characterization as identified by NYSDEC from their review of the 2021 RIR. Specifically, additional soil and groundwater samples will be collected at select locations and laboratory analyzed for TAL Metals including Mercury, Target Compound List (TCL) SVOCs, TCL VOCs, PCBs, Pesticides, Herbicides, and emerging contaminants (i.e., PFAS and 1,4-dioxane) since these potential contaminants of concern were not analyzed during previous investigations at the Site.

NYSDEC has requested supplemental soil and groundwater investigation for these contaminants. This supplemental investigation is intended to determine if these contaminants are present at concentrations that require further investigation and/or remediation.

Soil samples will be collected from nine new soil sampling locations at the Site (identified as B-201 to B-209 on Figure 3a) to assess the concentrations of the above-listed constituents. Soil samples will also be collected from two additional borings drilled at the previous GP-6 and GP-8 locations and sampled for VOCs only to evaluate whether VOC concentrations have decreased since the original borings were drilled and sampled in 2015. This will entail drilling soil borings at the select locations and sampling from the same (or similar) depth horizons as previous sampling locations nearby.

In addition, groundwater samples will be collected from select monitoring wells to assess the concentrations of the above listed constituents. The Technical Guidance for Site Investigation and Remediation (DER-10) states that only 20 or 25% of the wells at any given site are needed for the full target analyte list TAL/TCL list of parameters.

As shown on Figure 3a and consistent with historical soil quality data presented in Appendix A and Table 4a, soil sampling locations (B-201 to B-205) were selected to coincide with those previous locations that exhibited the highest concentrations of COCs (i.e., MW-102, MW-103, MW-104, and MW-105 in the western portion of the Site, and MW-109 and MW-1 in the southern and eastern portions of the Site, respectively).

Soil sampling locations B-206 to B-209 will be located in the furthest most western area (area not previously investigated) to evaluate this area for the contaminants of concern to determine whether the size or area of the BCP boundary can be reduced. Monitoring wells will be constructed in B-206 to B-209 for subsequent groundwater quality sampling as well.

Based on site-specific groundwater flow (see attached Figure 4), all existing monitoring wells (24 total) along with four proposed borings/wells B-206 to B-209 located at the Site will be sampled for TCL VOCs.

Three existing wells in the western portion of the Site shown on Figure 3a (MW-2, MW-3, and MW-4), the four new wells (B-206 to B-209), and 3 wells in the eastern side of the site (MW108S, MW-

109S, and MW-110S) will be sampled for the additional required analytical tests (TAL Metals including Mercury, TCL SVOCs, PCBs, Pesticides, Herbicides, and emerging contaminants (i.e., PFAS and 1,4-dioxane).

All six wells in the eastern portion of the Site (MW-1, MW-8S, MW-8D, MW-108S, MW-109S, and MW-110S) will also be sampled for Total cyanide.

In order to meet the objectives, the following tasks outlined below will be completed. Details are presented in Section 5.

- Advancement of five soil borings, via Geoprobe® rig, at locations shown as "Proposed Boring Locations" (identified as B-201 to B-205) on Figure 3a.
- Collection of five soil samples (one from each soil boring) from previous sample depths for TAL Metals including Mercury, TCL VOCs, TCL SVOCs, PCBs, Pesticides, Herbicides, PFAS, and 1,4-dioxane. Historical data (Appendix A and Table 4a) indicate the highest concentrations of COCs were reported at the following depths:
  - MW-102 (6.6 – 7.2'),
  - MW-103 (5.2 – 6.2'),
  - MW-104 (6.3 – 6.9'),
  - MW-105 (5.0 – 5.8'),
  - MW-109 (7 – 9'), and
  - MW-1/B-104 (9 – 10')
- Advancement of four soil borings, via Geoprobe® rig, at new locations shown as "Proposed Boring Locations" (identified as B-206 to B-209) on Figure 3a. Soil samples will be collected continuously to five feet below the encountered water table, logged, and screened with a photoionization detector (PID) to determine appropriate sample intervals. Soil samples from these two new borings will also be collected for analysis of TAL Metals including Mercury, TCL VOCs, TCL SVOCs, PCBs, Pesticides, Herbicides, PFAS, and 1,4-dioxane.
- Advancement of two soil borings, via Geoprobe® rig, at locations identified as GP-6 and GP-8 on Figure 3a.
- Collection of two soil samples (one from each soil boring) from previous sample depths for TCL VOCs. Historical data (Table 4a) indicate the highest concentrations of VOCs were reported at the following depths:
  - GP-6 (2.5 – 2.7'), and
  - GP-8 (2.1 – 2.3').
- Construction of four new monitoring wells at the B-206 to B-209 locations.

- Development of the four wells B-206 to B-209 along with re-development of all existing wells. The wells will be developed to improve their hydraulic connection with the surrounding aquifer and to reduce turbidity in future groundwater samples collected from the wells.

- Collection of groundwater samples from twenty-four existing Site well locations (MW-1, MW-2, MW-2D, MW-3, MW-4, MW-4D, MW-5, MW-6, MW-8S, MW-8D, MW-101S to MW-110S) and from four new wells (B-206 to B-209) for VOCs. Note that well MW-7, located in the southeastern portion of the Site, has not been able to be located for several years and is considered destroyed.

- Collection of additional groundwater samples from six of the twenty-four wells (MW-2, MW-3, MW-4, MW-108S, MW-109S, and MW-110S) and the four new wells (B-206 to B-209) for TAL Metals including Mercury, TCL SVOCs, PCBs, Pesticides, Herbicides, PFAS, and 1,4-dioxane.

- Collection of additional groundwater samples from six of the twenty-four wells on the eastern portion of the Site (MW-1, MW-8S, MW-8D, MW-108S, MW-109S, and MW-110S) for Total cyanide.

- Installing and sampling three Soil Vapor Probes (identified as SVP-301 to SVP-303 on Figure 3a) for VOCs via TO-15.

- Collection of waste characterization samples of the soil boring cuttings and groundwater development and purge water.

- Proper disposal of the investigation derived waste.

Details of the field investigation are provided in Section 5.

4.1 IDENTIFICATION OF STANDARDS, CRITERIA, AND GUIDANCE

Each media of concern soil, groundwater, soil vapor, and potentially free product) will be evaluated and compared against the appropriate NYSDEC cleanup standard or guidance in place at this time.

Soil. In December 2006, NYSDEC issued regulations at Section 6 of the New York Code, Rules and Regulations (6 NYCRR) Part 375, Environmental Remediation Programs, which applies to the Inactive Hazardous Waste Disposal Site Program (State Superfund, or SSF), the Environmental Restoration Program (ERP), and the BCP. Part 375-6.8 establishes Soil Cleanup Objectives (SCOs) that replaced TAGM 4046 guidance values. In addition, in October 2010, NYSDEC issued CP-51/Soil Cleanup Guidance, which applies to each of the remedial programs administered by NYSDEC's Division of Environmental Remediation (including SSF, the ERP, BCP and the Spill Response Program). CP-51 establishes supplemental SCOs for certain contaminants that were not included in Part 375.

Consistent with previous investigations the reported analytical concentrations for the analyzed constituents detected in soil at the Site will be compared to the Protection of Groundwater and Commercial SCOs provided in 6 NYCCR Table 375-6.8(b).

PFAS results in soils will be compared against the Protection of Groundwater and Commercial Guidance Values presented in NYSDEC's Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs dated April 2023.

Groundwater. The reported analytical concentrations for groundwater samples will be compared to the Ambient Water Quality Standards and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Series (TOGS) Groundwater Standards (AWQSGVs).

PFAS results in groundwater will be compared against the final AWQSGVs issued in March 2023.

Soil Vapor. The current NYSDOH guidance document entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York", dated October 2006 along with Soil Vapor Intrusion Updates, dated May 2017 (that include new ambient air guidelines for PCE and TCE, and soil vapor/indoor air decision matrices) and February 2024 (that include soil vapor/indoor air decision matrices for petroleum compounds) will be used to evaluate soil vapor results.

4.2 PROJECT ORGANIZATION

Stantec has assembled a project team for this investigation that includes engineers, geologists, hydrogeologists, scientists, data quality reviewers, and subcontractors to include a contaminant transport modeling specialist. The project organization involves the following Stantec staff and subcontractors:

- Project Manager: Don Moore (Qualified Environmental Professional)
- Senior Review: Alex DeNadai, P.E., PMP, LEED AP
- Senior Technical Reviewer: Craig Gendron, P.E., P.G. LSRP
- Quality Assurance Officer/Data Validator: Beth Crowley (Chemist)
- Health & Safety Officer: Don Moore
- Task Manager: Don Moore (Hydrogeologist)
- Remedial Technology Specialist: Angus McGrath, Ph.D.
- Laboratory Services: Eurofins/Test America Services, Inc. – New York State Accredited [National Environmental Laboratory Accreditation Conference (NELAC)].
- Drilling Subcontractor: To be determined.

- NY Licensed Surveyor: To be determined.

Resumes for all personnel listed above are attached in Appendix C.

5.0 Field Investigation/Scope of Work

The following subsections describe the SRIWP activities and objectives.

5.1 SAMPLING AND ANALYSIS PLAN

Preliminary activities in preparation for sampling include finalizing subcontracts, project team review of the scope of work, Health & Safety Plan and data quality objectives, finalizing the schedule with the driller subcontractor, obtaining signed access agreements as needed, making occupant notifications, and confirming access to locations for borings. Prior to mobilizing to the Site, soil boring locations will be identified and marked for utility clearance activities. Utility clearance will be conducted involving Dig Safely New York service and a private utility mark-out survey using ground penetrating radar (GPR) to further identify and locate underground utilities.

All work will be conducted in accordance with Stantec's updated site-specific health and safety plan presented in Appendix D.

To meet the objectives of this SRIWP, the following scope of work (SOW) has been developed to fill the data gaps identified from NYSDEC's review of the 2021 RIR. The SOW consists of advancing soil borings to collect subsurface soil samples and to collect groundwater samples from existing monitoring wells. The following subsections provide the SOW for each of these tasks. Detailed descriptions for sample collection, management and handling, analytical methods, etc. are provided in the Supplemental Quality Assurance Project Plan (QAPP) presented in Appendix E.

5.2 SOIL BORINGS

Stantec will oversee soil borings that will be advanced at five exterior locations (identified as B-201 to B-205 on Figure 3a). As presented in the historical tables in Appendix A and in Table 4a, soil borings in the western portion of the Site had concentrations of COCs reported above SCOs at the following locations/depths:

- MW-102 (6.6 – 7.2'),
- MW-103 (5.2 – 6.2'),
- MW-104 (6.3 – 6.9'),
- MW-105 (5.0 – 5.8').

As reported in the 2021 RIR, soil borings in the southern and eastern portions of the Site (evaluated by GEI) had concentrations of COCs reported above SCOs at the following locations:

- MW-109 (7 – 9'), and
- MW-1/B-104 (9 – 10').

These depth intervals will be the target depths for the proposed soil sampling described below.

Prior to drilling at each planned location, the asphalt surface will be cored with an anchored concrete coring unit, hand-held hammer drill, saw, or equivalent. Each boring will be hand cleared to five feet to further assess underground utility conflicts. Each boring will then be advanced with a Geoprobe® rig to five feet below the field encountered water table. Soil samples will be collected continuously and screened for visual/olfactory/photoionization detector [PID] evidence of impacts and characterized for soil classification. Based on visual, olfactory, and PID observations, soil samples will be collected at each boring for laboratory analysis of TAL Metals including Mercury, TCL VOCs, TCL SVOCs, PCBs, Pesticides and Herbicides, PFAS, and 1,4-dioxane. Although the target depths (based on, and consistent with, previous work) are shown below, the collected soil samples will be based on visual/olfactory/PID readings.

- B 201 5.0 -6.0 ft bls
- B-202 6.5 – 7.5 ft bls
- B-203 6.0 – 7.0 ft bls
- B-204 7.0 – 9.0 ft bls
- B-205 9.0 – 10.0 ft bls

To evaluate soil quality conditions in the uninvestigated far western area of the Site, Stantec will oversee four additional borings at locations identified as B-206 to B-209. These borings will also be advanced with a Geoprobe® rig to five feet below the field encountered water table. Soil samples will be collected continuously and screened for visual/olfactory/PID evidence of impacts and characterized for soil classification. Based on the visual, olfactory, and PID observations, soil samples will be collected at each boring for laboratory analysis of TAL Metals including Mercury, TCL VOCs, TCL SVOCs, PCBs, Pesticides, Herbicides, PFAS, and 1,4-dioxane. At the current time, target depths are unknown for B-206 to B-209.

To confirm the levels of VOCs detected in the 2015 Geoprobe borings, advanced in the vicinity of the 2008 HRC© injection area, Stantec will oversee two additional borings at two locations identified as GP-6 and GP-8. As presented in Table 4a, these two borings had concentrations of CVOCs reported above SCOs at the following locations/depths:

- GP-6 (2.5 – 2.7'), and
- GP-8 (2.1 – 2.3').

These depth intervals will be the target depths for the proposed soil sampling. Due to the shallow sampling intervals, hand clearing will be conducted to only two feet. Each boring will then be advanced with a Geoprobe® rig. Soil samples will be collected continuously to five feet below the water table and screened for visual/olfactory/PID evidence of impacts and characterized for soil classification. One soil sample will be collected at each boring for laboratory analysis of TCL VOCs and PFAS from the target depth listed above. Soil samples will also be collected at deeper intervals (based on visual, olfactory, and PID observations) as a means to delineate vertical impacts. As also shown in Table 4a, deeper samples were collected from GP-6 (5.5-5.7') and GP-

8 (6.3-6.5') in 2015. Those results showed decreasing concentrations in VOCs. Although PCE at 6.6 ppm in the GP-6 (5.5-5.7') sample was reported above the POG SCO, concentrations of VOCs at GP-8 (6.3-6.5') were reported as "below laboratory reporting limits" (RLS). Therefore, it is assumed that these two borings will be advanced to approximately 10 to 12 feet bls.

Further details are presented in the QAPP (Appendix E).

5.3 MONITORING WELL INSTALLATION

Following completion of the Geoprobe® boreholes at B-206 to B-209 to the selected depths, each boring will be re-drilled with 4.25-inch (inner-diameter) Hollow Stem Augers (HSA) to allow for the construction of monitoring wells. Each well will be constructed with ten-feet of slotted 2-inch inner diameter (ID) PVC screen and solid 2-inch ID PVC riser. The screened interval will straddle the field-determined water table and will be backfilled with clean filter sand to approximately 1 foot above the screen, followed by a 1- to 2-foot hydrated bentonite pellet seal. The remaining annular space in the borehole will be filled with clean sand to approximately 1 foot below ground surface. The wells will be completed at the surface with a flush mount road box and concrete seal.

5.4 MONITORING WELL DEVELOPMENT

After the wells at B-206 to B-209 are completed, they will be developed to reduce the amount of fines in the wells to improve their hydraulic connection with the surrounding aquifer, and to reduce turbidity in future samples. All existing Site wells will also be redeveloped.

The wells will be redeveloped utilizing a surge block and high-density polyethylene (HDPE) tubing connected to a peristaltic pump. A Stantec field technician will move the surge block and tubing up and down throughout the saturated well screen interval as a means to force groundwater in and out through the filter pack and native soils to remove any fine grains entrained in the filter pack. The peristaltic pump will be employed to pump water and fines, if any, out of the well into five-gallon buckets concurrently with the surging. The redevelopment water will be placed in 55-gallon drums that will be stored at the Site. Stantec will then work with a licensed transport and disposal company to properly remove and dispose of the drums at a later date (see Section 5.8 below).

5.5 GROUNDWATER SAMPLING

At least two weeks following well development, Stantec will mobilize to the Site to collect groundwater samples. Prior to collecting groundwater samples, depth to water will be measured at all Site wells. One round of groundwater samples will be collected from all twenty-four (24) existing Site wells (MW-1, MW-2, MW-2D, MW-3, MW-4, MW-4D, MW-5, MW-6, MW-8S, MW-8D, MW-101S to MW-110S) and the four newly installed wells (B-206 to B-209) for VOCs. Ten (10) of these wells (B-206, B-207, B-208, B-209, MW-2, MW-3, MW-4, MW-108S, MW-109S, and MW-110S) will also be tested for TAL Metals including Mercury, TCL SVOCs, PCBs, Pesticides and Herbicides, PFAS, and 1,4-dioxane as described in the QAPP. The ten select wells include upgradient well locations (B-206 to B-209, MW-3 and MW-109S), three downgradient well locations (MW-2, MW-108S, and MW-

110S), and a well (MW-4) positioned in the "source" area of the former dry cleaner, which is located in the former building in the western portion of the Site.

The six wells on the eastern portion of the Site (MW-1, MW-8S, MW-8D, MW-108S, MW-109S, and MW-110S) will also be tested for Total cyanide. Well locations are shown on Figure 3a.

Each well will be purged and sampled using low-flow sampling techniques in accordance with United States Environmental Protection Agency (USEPA) Region II guidance document entitled "Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells." The wells will be low-flow purged prior to sampling by evacuating groundwater at a rate between 120 and 280 milliliters per minute for a minimum of 55 minutes, or until stabilization of field parameters occurs.

Further details are presented in the QAPP (Appendix E).

5.6 SOIL VAPOR PROBES

Three new soil vapor sampling probes or points will be installed in the western parking lot area. These points are identified as SVP-301 to SVP-303 on Figure 3a. At each location, a Geoprobe boring will be advanced through the asphalt pavement and the underlying sediments to approximately two feet bls. Each probe will be constructed of 1-inch diameter stainless steel screen (~6 to 12 inches long) and set at 2 feet bls. PVC tubing will be connected to the top of the screen and extended to ground surface. Clean filter sand will be placed around the slotted portion of the probe and a bentonite seal placed from the top of the sand to the bottom of the asphalt parking lot. A small (3-inch diameter) road box with bolted manhole cover will be set and grouted flush to the parking lot surface at each location. Once installed, Stantec will perform leak tests on each vapor probe utilizing a helium shroud technique.

Soil vapor samples will subsequently be collected utilizing 2.7-liter summa canisters certified clean by the laboratory. The samples will be collected over a 2-hour interval. The 2.7-liter canisters will limit the need for the laboratory to dilute the samples and will allow for lower reporting limits. The samples will be shipped to the laboratory and analyzed for VOCs by Method TO-15.

Further details are presented in the QAPP (Appendix E).

5.7 DECONTAMINATION

Non-dedicated sampling equipment for soils (knife, trowel, etc.) and groundwater gauging (water level meter) will be used, so decontamination of that equipment and collection of a subsequent equipment blank will be necessary. Dedicated sampling equipment for groundwater sampling will be used at each well, so decontamination of that equipment will not be necessary and, therefore, an equipment blank for the purge and sampling equipment will not be necessary.

Decontamination will include using certified PFAS free (P-Free) water acquired from a laboratory that will be incorporated into the decontamination procedure. Decontamination will be conducted on all non-dedicated, non-disposable equipment and tools. The decontamination sequence will be performed as follows:

- Rinse with potable water;
- Use a bristle brush and potable-water/Alconox® (or an equivalent non-phosphate soap) solution to clean equipment;
- Rinse with potable water; and
- Perform a final rinse with P-Free water

5.8 INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) including auger cuttings, decontamination water, well development water, and purged water will be containerized in 55-gallon steel drums. Since the assumed source of the CVOC impacts are due to a former dry cleaner that was located in the previous building, the IDW is considered an F-listed Hazardous Waste. These materials will be sampled for the waste characterization parameters identified below.

- Toxicity Characteristic Leachate Procedure (TCLP) VOCs by USEPA SW-846 Method 1311/8260;
- TCLP SVOCs by USEPA SW-846 Method 1311/8270;
- Total RCRA Metals by USEPA SW-846 Method 6010 and Mercury by Method 7471;
- TCLP Metals by USEPA SW-846 Method 1311/6010A/7471;
- Corrosivity by USEPA SW-846 Method 9045B;
- Reactivity by USEPA SW-846 Method 9030;
- Ignitability (liquids only) by USEPA SW-846 Method 1010A; and
- PCBs by USEPA SW-846 Method 8082.

IDW containers will be labeled as "hazardous pending analytical results" and stored on-site for no more than 90 days. Drums containing decontamination and development water will be placed in secondary spill containment. Stantec will work with Stop and Shop personnel to store the drums in a secure location. Once the analytical results are received, the IDW will be disposed of in accordance with all federal, state, and local requirements.

6.0 Data Evaluation

The laboratory analytical reports will be presented in NYS Category B data deliverable format. Data validation and Data Usability Summary Reports (DUSRs) will then be completed by a qualified party independent from the laboratory preforming the analysis. The DUSRs will provide an evaluation of analytical data collected from this SRIWP with a determination stated in the reports whether or not the data meet the site-specific criteria for data quality and data use. The development of the DUSRs will be carried out by an experienced environmental scientist. The DUSR and the data deliverables package will be submitted to NYSDEC for review. The Stantec person identified for preparing the DUSR for this project is the Quality Assurance Officer: Beth Crowley (Chemist)

7.0 Reporting

Final and validated data results will be reported and summarized on tables and plotted on Site maps in order to evaluate the spatial relationship of the detected compound. Values exceeding standards will be highlighted. Analytical results that are reported below the analytical method detection limit (MDL) or method reporting limit (MRL) will be shown on the tables as non-detect (ND) along with the appropriate MDL or MRL. The results of sample analysis will be compared in the tables to applicable standards associated with the subject Site.

The supplemental remedial investigation data and results will be presented in a comprehensive Remedial Investigation Report (RIR). This RIR will include a discussion of background, history of land use, the objectives of the sampling and analysis plan, a summary of sampling and analyses conducted, and a discussion of the data.

8.0 Health and Safety Plan

Stantec has prepared a site-specific Health and Safety Plan (HASP) for similar work on the Site (see Appendix D).

The HASP meets Occupational Safety and Health Administration (OSHA) requirements for Hazardous Waste Operations (HAZWOPER) under 29 CFR 1910.120. The HASP includes an identification of the anticipated Site hazards, requirements for personal protective equipment (PPE) and air monitoring, action levels for upgrading PPE levels, and emergency procedures. Stantec will require that visitors to the Site, including client and regulatory agency personnel, comply with Stantec's HASP or provide their own HASP that is at least as stringent. Stantec personnel will meet the applicable OSHA training and medical monitoring requirements for HAZWOPER.

Prior to the start of fieldwork or any new field activity, Stantec's Site Safety Officer (SSO) will conduct a tailgate health and safety meeting for all field personnel. These meetings will be documented in Stantec's copy of the HASP kept on-Site and in the field notebook.

Based on Stantec's review of historical soil and groundwater concentrations that are, or can be, expected during the supplemental remedial investigation, Stantec anticipates initiating the work activities in Level D PPE. Action levels have been developed in the HASP for all compounds that are known to be present. In the event monitoring indicates an exceedance of constituent concentrations in air, consideration will first be given to engineering controls that can be instituted to reduce exposure. The DER-10 guidance includes provisions for a Community Air Monitoring Plan (CAMP). Stantec will utilize the CAMP approved by NYSDEC in July 2011, presented in Appendix F.

The HASP and CAMP prepared by Stantec address protection of the community for the activities to be performed. The work tasks (soil borings and groundwater sampling) are not expected to result in generation of significant airborne particulates due to the nature and limited area of the activity. Furthermore, air monitoring for VOCs and particulates will be completed within the work areas during the sampling activities. The CAMP addresses ceasing work if VOC and/or dust particulate concentrations exceed specific levels.

9.0 Schedule

A Gantt Chart depicting the proposed schedule is presented in Appendix G. The implementation of the SRIWP will begin with preliminary activities for coordination and implementation of the Community Participation Plan, including submitting the SRIWP into the established public repository, arranging access with property owners, contracting with subcontractors, and obtaining any permits necessary to conduct the investigation activities. The schedule presented below is the anticipated schedule at this time but is subject to change once the arrangements are made and work begins. The planned schedule for implementation is as follows:

Preliminary Activities: These activities as identified above will be initiated within 14 business days following receipt of written approval of this SRIWP from NYSDEC. The preliminary activities for mobilization are anticipated to involve 3 to 4 weeks, pending schedules of availability of the subcontractors, and anticipated weather conditions.

Set-up activities: These activities involve preparation of contracts for utility locator, drilling, laboratory analysis, and surveying. A site visit will be conducted to establish the work area for NY Dig Safely to mark out utilities. This action will be followed by the private utility locator to verify and clear the locations. A visit to the City's engineering office may be necessary to obtain street utility plans. These activities will also be initiated within 14 business days following written approval of this SRIWP from NYSDEC and are expected to involve 3-4 weeks, pending access and anticipated weather conditions.

Mobilization: Pending confirmation of Contractor availability, one to three weeks is anticipated for mobilization to the Site once set-up activities are completed. This time will be used to initiate the HASP and coordinate access to the Site for the drilling work locations.

Borings: The drilling time anticipated for this work is 4 to 5 business days beginning at 0830 hours on the first day and 0730 hours on subsequent days and working until about 1630 hours, pending approval by the property owner and occupants. This time may be extended, if necessary. Soil sampling and vapor point installation and sampling will be conducted during this time as well.

Groundwater sampling: Sampling will be initiated two weeks following completion of the boring task. Samples will be shipped to the laboratory each day of sample collection. Groundwater sampling is expected to take 6 business days. Days on-site sampling depend on the difficulty of low-flow sampling at each well, access, and weather conditions.

Analytical data are expected from the laboratory within 3 to4 weeks following the laboratory's receipt of samples. The data validation process will begin once data are received and will take 4 to 6 weeks to complete.

Data evaluation and preparation of al Remedial Investigation Report is anticipated to take 6 to 8 weeks from receipt of validated data.

Please note that the anticipated scope of work and schedule are dependent on field conditions and are subject to change.

10.0 References

Stantec Consulting Services Inc., July 15, 2011. *Supplemental Remedial Investigation Work Plan.*

Stantec Consulting Services Inc., February 12, 2018 (revised August 20, 2021). *Draft Remedial Investigation Report.*

Stantec Consulting Services Inc., June 15, 2018 (revised October 29, 2021). *Remedial Action Work Plan.*

TABLES

Table 1
Well Construction Details
Belle Harbor Shopping Center, Belle Harbor, New York

Well No	Well Type	Date of Installation	Grnd Surf Elev (ft MSL)	Top of PVC (ft MSL)	Northing	Easting	total Depth (ft bls)	Well Diameter (in)	Depth to Screened Interval Bot (ft bls)		Depth to Screened Interval Top (ft bls)	Elevation of Screened Interval Bot (ft bls)		Elevation of Screened Interval Top (ft bls)
MW-1	WT	3/12/2003	8.85	8.45	151,314.33'	1,030,226.51'	17	2	17	-	2	-8.15	-	6.85
MW-2	WT	3/12/2003	8.46	8.20	151,538.27'	1,029,982.84'	17	2	17	-	2	-8.54	-	6.46
MW-2D	DOB	5/25/2004	8.44	8.21	151,536.57'	1,029,977.93'	40	2	40	-	35	-31.56	-	-26.56
MW-3	WT	3/13/2003	8.95	8.57	151,274.13'	1,029,895.23'	17	2	16	-	2	-7.05	-	6.95
MW-4	WT	3/13/2003	8.85	8.60	151,328.23'	1,029,943.05'	16	2	16	-	2	-7.15	-	6.85
MW-4D	DOB	5/25/2004	8.88	8.55	151,333.94'	1,029,940.79'	40	2	40	-	35	-31.12	-	-26.12
MW-5	WT	3/14/2003	8.76	8.38	151,420.19'	1,029,904.96'	16	2	16	-	2	-7.24	-	6.76
MW-6	WT	3/14/2003	8.51	8.18	151,447.75'	1,029,810.51'	16	2	16	-	2	-7.49	-	6.51
MW-7	WT	5/24/2004	8.90	8.45	151,248.71'	1,030,277.14'	18	2	18	-	3	-9.10	-	5.90
MW-8S	WT	5/24/2004	8.82	8.49	151,465.32'	1,030,275.65'	17	2	17	-	2	-8.18	-	6.82
MW-8D	DOB	5/24/2004	8.90	8.57	151,462.65'	1,030,269.39'	40	2	40	-	35	-31.10	-	-26.10
MW-101S	WT	5/10/2012	9.12	8.65	151,235.35'	1,029,901.87'	10	2	10	-	5	-0.88	-	4.12
MW-101D	MLOB	5/10/2012	9.04	8.66	151,239.26'	1,029,912.98'	30	2	28	-	23	-18.96	-	-13.96
MW-102S	WT	5/9/2012	9.63	9.27	151,373.46'	1,029,932.26'	12	2	10	-	5	-0.37	-	4.63
MW-102D	MLOB	5/9/2012	9.57	9.26	151,376.58'	1,029,941.13'	24	2	22	-	17	-12.43	-	-7.43
MW-103	MLOB	5/11/2012	9.01	8.47	151,313.18'	1,029,933.14'	28	2	26	-	21	-16.99	-	-11.99
MW-104S	WT	5/8/2012	9.06	8.51	151,301.76'	1,029,914.79'	14	2	12	-	7	-2.94	-	2.06
MW-104A -S	MLOB	5/9/2012	9.09	8.69	151,310.63'	1,029,911.67'	24	2	22	-	17	-12.91	-	-7.91
MW-104D	DOB	6/20/2012	9.19	8.93	151,319.50'	1,029,908.55'	40	2	38	-	33	-28.81	-	-23.81
MW-105S	MLOB	5/11/2012	8.80	8.54	151,388.80'	1,029,863.48'	24	2	22	-	12	-13.20	-	-3.20
MW-106S	MLOB	5/11/2012	9.61	9.13	151,455.52'	1,029,907.50'	20	2	18	-	8	-8.39	-	1.61
MW-107	MLOB	5/10/2012	9.47	9.01	151,266.96'	1,029,970.71'	28	2	25	-	20	-15.53	-	-10.53
MW-108S	WT	10/24/2012	8.52	8.36	151,337.14'	1,030,225.81'	20	2	20	-	5	-11.48	-	3.52
MW-109S	WT	10/24/2012	9.81	9.61	151,334.66'	1,030,266.88'	15	2	15	-	5	-5.19	-	4.81
MW-110S	WT	10/24/2012	8.30	8.04	151,211.87'	1,030,144.84'	20	2	20	-	5	-11.70	-	3.30

Notes:
ft MSL = Feet ablove Mean Sea Level (elevations based on NGVD 1929 Datum)
ft bls = feet below land surface
MW-1 through MW-8D installed by Whitestone Associates, Inc
MW-101S through MW-107 installed by Stantec Consulting Services
MW-108S through MW-110S installed by GEI Consultants, Inc. Subsequent survey arranged by GEI.

WT = Water Table
MLOB = Mid-Level Overburden
DOB = Deep Overburden

Horizontal Datum: New York State Plane Coordinate System Long Island Zone, NA Datum 1983 (NAD 83)
Vertical Datum: National Geodetic Vertical Datum 1929 (NGVD 1929).

Table 2
Water Level Data
Belle Harbor Shopping Center, Belle Harbor, New York

Well No	Well Type	Date of Installation	Grnd Surf Elev (ft MSL)	Top of PVC (ft MSL)	Elevation of Screened Interval Bot (ft bls)		Elevation of Screened Interval Top (ft bls)	Depth to Water 6/26/2012 (ft PVC)	Depth to Water 1/31/2018 (ft PVC)	Depth to Water 8/3/2020 (ft PVC)	Water Level Elevation 6/26/2012 (ft MSL)	Water Level Elevation 1/31/2018 (ft MSL)	Water Level Elevation 8/3/2020 (ft MSL)
MW-1	WT	3/12/2003	8.85	8.45	-8.15	-	6.85	5.32	5.76	NM	3.13	2.69	NM
MW-2	WT	3/12/2003	8.46	8.20	-8.54	-	6.46	5.85	NM	5.60	2.35	NM	2.60
MW-2D	DOB	5/25/2004	8.44	8.21	-31.56	-	-26.56	6.58	7.63	5.25	1.63	0.58	2.96
MW-3	WT	3/13/2003	8.95	8.57	-7.05	-	6.95	5.13	6.38	5.34	3.44	2.19	3.23
MW-4	WT	3/13/2003	8.85	8.60	-7.15	-	6.85	5.60	6.48	5.41	3.00	2.12	3.19
MW-4D	DOB	5/25/2004	8.88	8.55	-31.12	-	-26.12	6.08	6.45	5.61	2.47	2.10	2.94
MW-5	WT	3/14/2003	8.76	8.38	-7.24	-	6.76	5.55	6.41	5.69	2.83	1.97	2.69
MW-6	WT	3/14/2003	8.51	8.18	-7.49	-	6.51	5.35	6.24	NM	2.83	1.94	NM
MW-7	WT	5/24/2004	8.90	8.45	-9.10	-	5.90	5.51	NM	NM	2.94	NM	NM
MW-8S	WT	5/24/2004	8.82	8.49	-8.18	-	6.82	6.07	5.80	NM	2.42	2.69	NM
MW-8D	DOB	5/24/2004	8.90	8.57	-31.10	-	-26.10	NM	5.89	NM	NM	2.68	NM
												nh	
MW-101S	WT	5/10/2012	9.12	8.65	-0.88	-	4.12	5.09	6.54	NM	3.56	2.11	NM
MW-101D	MLOB	5/10/2012	9.04	8.66	-18.96	-	-13.96	6.58	6.33	NM	2.08	2.33	NM
MW-102S	WT	5/9/2012	9.63	9.27	-0.37	-	4.63	5.83	6.77	NM	3.44	2.50	NM
MW-102D	MLOB	5/9/2012	9.57	9.26	-12.43	-	-7.43	6.45	7.56	NM	2.81	1.70	NM
MW-103	MLOB	5/11/2012	9.01	8.47	-16.99	-	-11.99	6.93	NM	NM	1.54	NM	NM
MW-104S	WT	5/8/2012	9.06	8.51	-2.94	-	2.06	5.33	6.43	5.53	3.18	2.08	2.98
MW-104A -S	MLOB	5/9/2012	9.09	8.69	-12.91	-	-7.91	5.62	NM	NM	3.07	NM	NM
MW-104D	DOB	6/20/2012	9.19	8.93	-28.81	-	-23.81	5.70	6.18	6.11	3.23	2.75	2.82
MW-105S	MLOB	5/11/2012	8.80	8.54	-13.20	-	-3.20	6.23	6.79	NM	2.31	1.75	NM
MW-106S	MLOB	5/11/2012	9.61	9.13	-8.39	-	1.61	6.37	7.20	6.62	2.76	1.93	2.51
MW-107	MLOB	5/10/2012	9.47	9.01	-15.53	-	-10.53	5.60	7.26	NM	3.41	1.75	NM
MW-108S	WT	10/24/2012	8.52	8.36	-11.48	-	3.52	NI	5.60	NM	NI	2.76	NM
MW-109S	WT	10/24/2012	9.81	9.61	-5.19	-	4.81	NI	7.09	NM	NI	2.52	NM
MW-110S	WT	10/24/2012	8.3	8.04	-11.70	-	3.30	NI	5.28	NM	NI	2.76	NM

Notes:
ft MSL = Feet ablove Mean Sea Level (elevations based on NGVD 1929 Datum)
ft bls = feet below land surface
ft PVC = feet below PVC measuring point
MW-1 through MW-8D installed by Whitestone Associates, Inc
MW-101S through MW-107 installed by Stantec Consulting Services
MW-108S through MW-110S installed by GEI Consultants, Inc.

WT = Water Table
MLOB = Mid-Level Overburden
DOB = Deep Overburden
NI = Not Installed at time of well gauging.
NM = Not Measured, not accessible

Horizontal Datum: New York State Plane Coordinate System Long Island Zone, NA Datum 1983 (NAD 83)
Vertical Datum: National Geodetic Vertical Datum 1929 (NGVD 1929).

Table 2a
Tidal/Water Level Data
Belle Harbor Shopping Center, Belle Harbor, New York

Well No		Date of Installation	Grnd Surf Elev (ft MSL)	Top of PVC (ft MSL)	Depth to Screened Interval Bot (ft bls)		Top (ft bls)	Mid Pt. Screen (ft bls)	Depth to Water Low Tide 3/13/13 3:30 PM (ft bls)	Depth to Water High Tide 3/14/13 10:00 AM (ft bls)	Water Level Elevations Low Tide 3/13/13 3:30 PM (ft MSL)	Water Level Elevations High Tide 3/14/13 10:00 AM (ft MSL)
MW-1	WT	3/12/2003	8.85	8.45	17	-	2	9.5	5.62	NM	2.83	
MW-2	WT	3/12/2003	8.46	8.20	17	-	2	9.5	5.52	5.59	2.68	2.61
MW-2D	DOB	5/25/2004	8.44	8.21	40	-	35	37.5	7.04	5.17	1.17	3.04
MW-3	WT	3/13/2003	8.95	8.57	16	-	2	9	5.42	5.43	3.15	3.14
MW-4	WT	3/13/2003	8.85	8.60	16	-	2	9	5.63	5.52	2.97	3.08
MW-4D	DOB	5/25/2004	8.88	8.55	40	-	35	37.5	6.38	5.33	2.17	3.22
MW-5	WT	3/14/2003	8.76	8.38	16	-	2	9	5.49	5.58	2.89	2.80
MW-6	WT	3/14/2003	8.51	8.18	16	-	2	9	5.41	5.47	2.77	2.71
MW-7	WT	5/24/2004	8.90	8.45	18	-	3	10.5	NM	NM	NM	NM
MW-8S	WT	5/24/2004	8.82	8.49	17	-	2	9.5	5.59	5.75	2.90	2.74
MW-8D	DOB	5/24/2004	8.90	8.57	40	-	35	37.5	6.44	5.48	2.13	3.09
MW-101S	WT	5/10/2012	9.12	8.65	10	-	5	7.5	5.39	5.43	3.26	3.22
MW-101D	MLOB	5/10/2012	9.04	8.66	28	-	23	25.5	6.53	5.24	2.13	3.42
MW-102S	WT	5/9/2012	9.63	9.27	10	-	5	7.5	5.83	5.94	3.44	3.33
MW-102D	MLOB	5/9/2012	9.57	9.26	22	-	17	19.5	6.62	5.89	2.64	3.37
MW-103	MLOB	5/11/2012	9.01	8.47	26	-	21	23.5	6.68	5.26	1.79	3.21
MW-104S	WT	5/8/2012	9.06	8.51	12	-	7	9.5	5.51	5.52	3.00	2.99
MW-104A -S	MLOB	5/9/2012	9.09	8.69	22	-	17	19.5	6.94	5.49	1.75	3.20
MW-104D	DOB	6/20/2012	9.19	8.93	38	-	33	35.5	7.04	5.60	1.89	3.33
MW-105S	MLOB	5/11/2012	8.80	8.54	22	-	12	17	6.18	5.33	2.36	3.21
MW-106S	MLOB	5/11/2012	9.61	9.13	18	-	8	13	6.51	6.24	2.62	2.89
MW-107	MLOB	5/10/2012	9.47	9.01	25	-	20	22.5	6.83	5.54	2.18	3.47

Notes:
ft MSL = Feet ablove Mean Sea Level (elevations based on NGVD 1929 Datum)
ft bls = feet below land surface
MW-1 through MW-8D installed by Whitestone Associates, Inc
MW-101S through MW-107 installed by Stantec Consulting Services
MW-108S through MW-110S installed by GEI Consultants, Inc.

WT = Water Table
MLOB = Mid-Level Overburden
DOB = Deep Overburden
NM = Not Measured, not accessible

Horizontal Datum: New York State Plane Coordinate System Long Island Zone, NA Datum 1983 (NAD 83)
Vertical Datum: National Geodetic Vertical Datum 1929 (NGVD 1929).

TABLE 3
Vertical Hydraulic Gradients at Well Pairs
Belle Harbor Shopping Center, Belle Harbor, New York

Well No.	Well Type	Mid Pt. Screen (ft MSL)	Water Level Elevations 3/13/2013 Low Tide (ft MSL)	Water Level Elevations 3/14/2013 High Tide (ft MSL)	Vertical Hydraulic Gradients 3/13/2013 Low Tide (ft/ft)	Vertical Hydraulic Gradients 3/14/2013 High Tide (ft/ft)
MW-2	WT	-1.04	2.68	2.61	-5.39E-02	1.53E-02
MW-2D	DOB	-29.06	1.17	3.04		
MW-4	WT	-0.15	2.97	3.08	-2.81E-02	4.92E-03
MW-4D	DOB	-28.62	2.17	3.22		
MW-8S	WT	-0.68	2.90	2.74	-2.76E-02	1.25E-02
MW-8D	DOB	-28.60	2.13	3.09		
MW-101S	WT	1.62	3.26	3.22	-6.25E-02	1.11E-02
MW-101D	MLOB	-16.46	2.13	3.42		
MW-102S	WT	2.13	3.44	3.33	-6.63E-02	3.32E-03
MW-102D	MLOB	-9.93	2.64	3.37		
MW-104S	WT	-0.44	3.00	2.99	-1.25E-01	2.11E-02
MW-104A -S	MLOB	-10.41	1.75	3.20		
MW-104A -S	MLOB	-10.41	1.75	3.20	8.81E-03	8.18E-03
MW-104D	DOB	-26.31	1.89	3.33		

NOTES
ft MSL = Feet ablove Mean Sea Level (elevations based on NGVD 1929 Datum)
NM = Not Measured
\- = Downward vertical gradient

Horizontal Datum: New York State Plane Coordinate System Long Island Zone, NA Datum 1983 (NAD 83)
Vertical Datum: National Geodetic Vertical Datum 1929 (NGVD 1929).

Table 4
Soil Sampling Summary
Belle Harbor Shopping Center, Belle Harbor, New York

Well ID	Date of Installation	Total Depth (ft bls)	Depth to GW (ft bls)	Soi Interval Sampled (ft bls)	Analyses Conducted	DV/DUSR
MW-1	3/12/2003	17	7.5	1.0 - 1.5	V, S, M, P, PCB	Yes
				7.0 - 7.5	V, S, M, P, PCB	Yes
MW-2	3/12/2003	17	7.5	1.0 - 1.5	V, S, M, P, PCB	Yes
				7.0 - 7.5	V, S, M, P, PCB	Yes
MW-2D	5/25/2004	40	8.2	NS	-	
MW-3	3/13/2003	17	7.0	2.0 - 2.5	V, S, M, P, PCB	Yes
				6.5 - 7.0	V, S, M, P, PCB	Yes
MW-4	3/13/2003	16	7.0	NS	NS	-
MW-4D	5/25/2004	40	8.5	NS	-	
MW-5	3/14/2003	16	7.0	NS	NS	-
MW-6	3/14/2003	16	7.0	NS	NS	-
MW-7	5/24/2004	18	6.0	5.5 - 6.0	V, S, M	Yes
MW-8	5/24/2004	17	5.0	4.5 - 6.0	V, S, M	Yes
MW-8D	5/24/2004	40	8.5	NS	-	
MW-101	5/10/2012	30	6.58	5.0 - 6.0	V, S, M	Yes
				27.6 - 28.6	V, S, M	Yes
MW-102	5/9/2012	24	6.45	6.6 - 7.2	V, S, M	Yes
				22 - 23	V, S, M	Yes
MW-103	5/11/2012	28	6.93	5.2 - 6.2	V, S, M	Yes
				25 - 26	V, S, M	Yes
MW-104	5/8/2012	40	5.70	6.3 - 6.9	V, S, M	Yes
				37 - 38	V, S, M	Yes
MW-105S	5/11/2012	24	6.23	5.0 - 5.8	V, S, M	Yes
				21 - 22	V, S, M	Yes
MW-106S	5/11/2012	20	6.37	6.0 - 7.0	V, S, M	Yes
				16.0 - 17.0	V, S, M	Yes
MW-107S	5/11/2012	28	5.60	6.0 - 6.9	V, S, M	Yes
				25 - 26	V, S, M	Yes
B-103	5/18/2012			5 - 7	V, S, M, CN	Yes
				10 - 12	V, S, M, CN	Yes
				21 - 23	V, S, M, CN	Yes
B-104	5/16/2012			7 - 8	V, S, M, CN	Yes
				9 - 10	V, S, M, CN	Yes
				38 - 40	V, S, M, CN	Yes
B-105	5/17/2012			8 - 10	V, S, M, CN	Yes
				12 - 14	V, S, M, CN	Yes
				36 - 40	V, S, M, CN	Yes
B-106	5/17/2012			6.5 - 7.5	V, S, M, CN	Yes
				12 - 14	V, S, M, CN	Yes
				28 - 30	V, S, M, CN	Yes
B-107	5/16/2012			8.5 - 10	V, S, M, CN	Yes
				11 - 12	V, S, M, CN	Yes
				22 - 24	V, S, M, CN	Yes

Table 4
Soil Sampling Summary
Belle Harbor Shopping Center, Belle Harbor, New York

Well ID	Date of Installation	Total Depth (ft bls)	Depth to GW (ft bls)	Soi Interval Sampled (ft bls)	Analyses Conducted	DV/DUSR
B-108	5/17/2012			8 - 10	V, S, M, CN	Yes
				12 - 14	V, S, M, CN	Yes
				30 - 32	V, S, M, CN	Yes
B-109	5/22/2012			7 - 9	V, S, M, CN	Yes
				12 - 14	V, S, M, CN	Yes
				38 -40	V, S, M, CN	Yes
B-110	5/22/2012			1 - 3	V, S, M, CN	Yes
				5.5 - 7.5	V, S, M, CN	Yes
				12 - 14	V, S, M, CN	Yes
				21 - 23	V, S, M, CN	Yes
B-111	5/25/2012			6.5 - 7.5	V, S, M, CN	Yes
				13.5 - 15	V, S, M, CN	Yes
				21 - 23	V, S, M, CN	Yes
B-112	5/23/2022			4.5 - 5.5	V, S, M, CN	Yes
				10 - 12	V, S, M, CN	Yes
				38 -40	V, S, M, CN	Yes
B-113	5/22/2012			8 - 10	V, S, M, CN	Yes
				13 - 15	V, S, M, CN	Yes
				38 - 40	V, S, M, CN	Yes
B-114	5/29/2012			7.5 - 9.5	V, S, M, CN	Yes
				11 - 13	V, S, M, CN	Yes
				18 - 20	V, S, M, CN	Yes
B-115	6/22/2012			1 - 3	V, S, M, CN	Yes
				5 - 7	V, S, M, CN	Yes
B-116	6/22/2012			1 - 3	V, S, M, CN	Yes
				5 - 7	V, S, M, CN	Yes
B-117	6/22/2012			1 - 3	V, S, M, CN	Yes
				5 - 7	V, S, M, CN	Yes
B-118	6/22/2012			1 - 3	V, S, M, CN	Yes
				5 - 7	V, S, M, CN	Yes
MW-110	10/12/2012			7 - 9	V, S, M, CN	Yes
				11 - 13	V, S, M, CN	Yes
				15 - 17	V, S, M, CN	Yes
GP-1	7/1/2015			3.6 - 3.8	V	No
				6.0 - 6.2	V	No
GP-2	7/1/2015			3.0 - 3.2	V	No
				6.0 - 6.2	V	No
GP-3	7/1/2015			2.7 - 2.9	V	No
				5.9 - 6.1	V	No
GP-4	7/1/2015			1.4 - 1.6	V	No
				5.8 - 6.0	V	No
GP-5	7/1/2015			3.3 - 3.5	V	No
				5.9 - 6.1	V	No
GP-6	7/1/2015			2.5 - 2.7	V	No
				5.5 - 57	V	No
GP-7	7/1/2015			3.8 - 4.0	V	No
				6.6 - 6.8	V	No
GP-8	7/1/2015			2.1 - 2.3	V, S	No
				6.3 - 6.5	V	No

Table 4
Soil Sampling Summary
Belle Harbor Shopping Center, Belle Harbor, New York

Well ID	Date of Installation	Total Depth (ft bls)	Depth to GW (ft bls)	Soi Interval Sampled (ft bls)	Analyses Conducted	DV/DUSR

Notes:
GW = Groundwater
ft bls = feet below land surface
DV/DUSR = Data Validation / Data Usability Summary Report
V = Volatile organic compounds by Method 8260
S = Semi-volatile organic compounds by Method 8270
M = Metals by Methods 6010/7471A/9010B
P = Pesticides by Method 8081
PCB = Polychlorinated biphenyls by Method 8082
CN = Cyanide (total and free)
NS = No soil sample submitted for analysis

MW-1 to MW-8 installed by Whitestone Associates, Inc. See Appendix B.
MW-101 to MW-107 installed by Stantec. See Tables 4a to 4C.
B-103 to B-118, and MW-110 installed by GEI Consultants, Inc. See Appendix A

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives: Commercial SCOs	NYSDEC Soil Cleanup Objectives: Protection of Groundwater SCO														
Sample ID				MW-101(5.0'-6.0')		MW-101(27.6'-28.6')		MW-102(6.6'-7.2')		MW-102(22.0'-23.0')		MW-103 (5.2'-6.2')		MW-103 (25'-26')		MW-104(6.3'-6.9')	
Laboratory ID				460-00040154-005		460-00040154-006		460-00040154-003		460-00040154-004		460-00040261-001		460-00040261-002		460-00040154-001	
Sampling Date				5/10/2012		5/10/2012		5/9/2012		5/9/2012		5/11/2012		5/11/2012		5/8/2012	
Matrix				Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor				1		1		1		1		50		1		1	
Volatile Organic Compounds (VOCs) by EPA Method 8260B				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	mg/kg	500	0.68	0.00012	U	0.00014	U	0.00013	U	0.00014	U	0.0059	U	0.00014	U	0.00016	U
1,1,2,2-Tetrachloroethane	mg/kg	NS	NS	0.000086	U	0.000099	U	0.000092	U	0.000099	U	0.015	U	0.0001	U	0.00011	U
1,1,2-Trichloroethane	mg/kg	NS	NS	0.00013	U	0.00015	U	0.00014	U	0.00015	U	0.018	U	0.00016	U	0.00017	U
1,1-Dichloroethane	mg/kg	240	0.27	0.00011	U	0.00012	U	0.00011	U	0.00012	U	0.012	U	0.00012	U	0.00013	U
1,1-Dichloroethene	mg/kg	5.1	0.33	0.00018	U	0.00021	U	0.00019	U	0.00021	U	0.0083	U	0.00021	U	0.00023	U
1,2,4-Trichlorobenzene	mg/kg	NS	NS	0.00018	U	0.00021	U	0.00019	U	0.00021	U	0.032	U	0.00021	U	0.00023	U
1,2-Dibromo-3-Chloropropane	mg/kg	NS	NS	0.00042	U	0.00049	U	0.00045	U	0.00048	U	0.038	U	0.00049	U	0.00053	U
1,2-Dibromoethane	mg/kg	NS	NS	0.00014	U	0.00017	U	0.00015	U	0.00016	U	0.026	U	0.00017	U	0.00018	U
1,2-Dichlorobenzene	mg/kg	500	1.1	0.000096	U	0.00011	U	0.0001	U	0.00011	U	0.019	U	0.00011	U	0.00012	U
1,2-Dichloroethane	mg/kg	30	0.02	0.00017	U	0.0002	U	0.00018	U	0.0002	U	0.018	U	0.0002	U	0.00022	U
1,2-Dichloropropane	mg/kg	NS	NS	0.00014	U	0.00017	U	0.00015	U	0.00016	U	0.0081	U	0.00017	U	0.00018	U
1,3-Dichlorobenzene	mg/kg	280	2.6	0.00015	U	0.00018	U	0.00016	U	0.00018	U	0.013	U	0.00018	U	0.00019	U
1,4-Dichlorobenzene	mg/kg	130	1.8	0.00011	U	0.00012	U	0.00011	U	0.00012	U	0.022	U	0.00012	U	0.00013	U
2-Butanone (MEK)	mg/kg	500	0.10	0.0006	U	0.0007	U	0.00064	U	0.00069	U	0.22	U	0.0007	U	0.0038	J
2-Hexanone	mg/kg	NS	NS	0.00012	U	0.00014	U	0.00013	U	0.00014	U	0.047	U	0.00014	U	0.00016	U
4-Methyl-2-pentanone (MIBK)	mg/kg	NS	NS	0.00019	U	0.00022	U	0.0002	U	0.00022	U	0.093	U	0.00022	U	0.00024	U
Acetone	mg/kg	500	0.03	0.01	B	0.018	B	0.0042	J B	0.011	B	0.25	U	0.045	B	0.02	B
Benzene	mg/kg	20	0.06	0.00077	J	0.00017	U	0.00015	U	0.00016	U	0.014	J	0.00017	U	0.002	
Bromodichloromethane	mg/kg	NS	NS	0.00031	U	0.00035	U	0.00033	U	0.00035	U	0.012	U	0.00036	U	0.00039	U
Bromoform	mg/kg	NS	NS	0.00016	U	0.00019	U	0.00017	U	0.00019	U	0.018	U	0.00019	U	0.00021	U
Bromomethane	mg/kg	NS	NS	0.00041	U	0.00048	U	0.00044	U	0.00047	U	0.017	U	0.00048	U	0.00052	U
Carbon disulfide	mg/kg	NS	NS	0.00055	J	0.0016		0.00015	U	0.0012		0.012	U	0.00028	J	0.00064	J
Carbon tetrachloride	mg/kg	41	0.76	0.00014	U	0.00017	U	0.00015	U	0.00016	U	0.0054	U	0.00017	U	0.00018	U
Chlorobenzene	mg/kg	500	1.1	0.00017	U	0.0002	U	0.00018	U	0.0002	U	0.01	U	0.0002	U	0.00022	U
Chloroethane	mg/kg	NS	NS	0.00032	U	0.00036	U	0.00034	U	0.00036	U	0.016	U	0.00037	U	0.0004	U
Chloroform	mg/kg	180	0.37	0.00023	U	0.00027	U	0.00024	U	0.00026	U	0.0074	U	0.00027	U	0.00029	U
Chloromethane	mg/kg	NS	NS	0.00015	U	0.00018	U	0.00016	U	0.00018	U	0.0091	U	0.00018	U	0.00019	U
cis-1,2-Dichloroethene	mg/kg	500	0.19	0.00011	U	0.00012	U	0.00011	U	0.00012	U	0.049	J	0.00012	U	0.0056	
cis-1,3-Dichloropropene	mg/kg	NS	NS	0.00013	U	0.00015	U	0.00014	U	0.00015	U	0.017	U	0.00016	U	0.00017	U
Cyclohexane	mg/kg	NS	NS	0.00012	U	0.00014	U	0.00013	U	0.00014	U	0.015	U	0.00014	U	0.00016	U
Dibromochloromethane	mg/kg	NS	NS	0.000096	U	0.00011	U	0.0001	U	0.00011	U	0.019	U	0.00011	U	0.00012	U
Dichlorodifluoromethane	mg/kg	NS	NS	0.00021	U	0.00024	U	0.00022	U	0.00024	U	0.02	U	0.00024	U	0.00027	U
Ethylbenzene	mg/kg	390	1.0	0.00016	U	0.00019	U	0.00017	U	0.0011		0.009	U	0.00019	U	0.00032	J
Freon TF	mg/kg	NS	NS	0.00011	U	0.00012	U	0.00011	U	0.00012	U	0.0077	U	0.00012	U	0.00013	U
Isopropylbenzene	mg/kg	NS	NS	0.00011	U	0.00012	U	0.00011	U	0.00017	J	0.0072	U	0.00012	U	0.00013	U
Methyl acetate	mg/kg	NS	NS	0.00031	U	0.00035	U	0.00033	U	0.00035	U	0.032	U	0.00036	U	0.00039	U
Methylcyclohexane	mg/kg	NS	NS	0.000096	U	0.00011	U	0.0001	U	0.00011	U	0.013	U	0.00011	U	0.00012	U
Methylene Chloride	mg/kg	500	0.05	0.0066	B	0.014	B	0.0027	B	0.0063	B	0.017	U	0.011		0.0057	B
Methyl tert-butyl ether (MTBE)	mg/kg	500	0.1	0.00011	U	0.00012	U	0.00011	U	0.00022	J	0.013	U	0.00012	U	0.00013	U
Styrene	mg/kg	NS	NS	0.00027	U	0.00031	U	0.0011		0.00031	U	0.014	J	0.00031	U	0.0012	
Tetrachloroethene	mg/kg	81	1.30	0.00094	J	0.00013	U	0.0019		0.00013	U	**16**		0.00013	U	0.12	
Toluene	mg/kg	500	0.70	0.0013		0.00044	J	0.00035	J	0.00033	J	0.026	J	0.00047	J B	0.0028	
trans-1,2-Dichloroethene	mg/kg	500	0.19	0.00012	U	0.00014	U	0.00013	U	0.00014	U	0.012	U	0.00014	U	0.0013	
trans-1,3-Dichloropropene	mg/kg	NS	NS	0.000096	U	0.00011	U	0.0001	U	0.00011	U	0.023	U	0.00011	U	0.00012	U
Trichloroethene	mg/kg	54	0.47	0.00011	U	0.00013	U	0.00012	U	0.00013	U	0.034	J	0.00013	U	0.0055	
Trichlorofluoromethane	mg/kg	NS	NS	0.00015	U	0.00018	U	0.00016	U	0.00018	U	0.014	U	0.00018	U	0.00019	U
Vinyl chloride	mg/kg	7.1	0.03	0.00032	U	0.00038	U	0.00035	U	0.00037	U	0.014	U	0.00038	U	0.00041	U
Xylenes, Total	mg/kg	500	1.2	0.00064	U	0.00074	U	0.00068	U	0.0017	J	0.034	U	0.00074	U	0.0016	J
Total Confident Conc.	mg/Kg			0.02016		0.03404		0.01025		0.02202		16.137		0.0113		0.17046	
Total Estimated Conc. (TICs)	mg/Kg			0		0		0		0.6581		0				0.1047	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
J = Concentration is an approximate value.
B = Compound found in the blank and sample
** Positive and "not detected" VOC results for MW-105 (21-22) should be considered estimated (J)
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019

Bold =	Concentration exceeds Protection of Groundwater Soil Cleanup Objectives
***Bold* =**	Concentration exceeds Commercial Soil Cleanup Objectives
***Bold* =**	Concentration exceeds both Protection of Groundwater and Commercial Soil Cleanup Objectives
NS =	No Standard

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives: Commercial SCOs	NYSDEC Soil Cleanup Objectives: Protection of Groundwater SCO														
Sample ID				MW-104(37'-38')		MW-105(5.0'-5.8')		MW-105(21'-22')		MW-106(6.0'-7.0')		MW-106(16.0'-17.0')		MW-107(6.0'-6.9')		MW-107(25.0'-26.0')	
Laboratory ID				460-00040154-002		460-00040154-011		460-00040154-012		460-00040154-009		460-00040154-010		460-00040154-007		460-00040154-008	
Sampling Date				5/8/2012		5/11/2012		5/11/2012		5/11/2012		5/11/2012		5/10/2012		5/10/2012	
Matrix				Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor				1		1		1		1		1		1		1	
Volatile Organic Compounds (VOCs) by EPA Method 8260B				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	mg/kg	500	0.68	0.00015	U	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.00013	U	0.00015	U
1,1,2,2-Tetrachloroethane	mg/kg	NS	NS	0.0001	U	0.000093	U	0.000096	U	0.000092	U	0.0001	U	0.000092	U	0.0001	U
1,1,2-Trichloroethane	mg/kg	NS	NS	0.00016	U	0.00015	U	0.00015	U	0.00014	U	0.00016	U	0.00014	U	0.00016	U
1,1-Dichloroethane	mg/kg	240	0.27	0.00013	U	0.00011	U	0.00012	U	0.00011	U	0.00013	U	0.00011	U	0.00013	U
1,1-Dichloroethene	mg/kg	5.1	0.33	0.00022	U	0.0002	U	0.0002	U	0.00019	U	0.00022	U	0.00019	U	0.00022	U
1,2,4-Trichlorobenzene	mg/kg	NS	NS	0.00022	U	0.0002	U	0.0002	U	0.00019	U	0.00022	U	0.00019	U	0.00022	U
1,2-Dibromo-3-Chloropropane	mg/kg	NS	NS	0.00051	U	0.00046	U	0.00047	U	0.00045	U	0.00051	U	0.00045	U	0.00051	U
1,2-Dibromoethane	mg/kg	NS	NS	0.00017	U	0.00016	U	0.00016	U	0.00015	U	0.00017	U	0.00015	U	0.00017	U
1,2-Dichlorobenzene	mg/kg	500	1.1	0.00012	U	0.0001	U	0.00011	U	0.0001	U	0.00012	U	0.0001	U	0.00012	U
1,2-Dichloroethane	mg/kg	30	0.02	0.00021	U	0.00019	U	0.00019	U	0.00018	U	0.00021	U	0.00018	U	0.00021	U
1,2-Dichloropropane	mg/kg	NS	NS	0.00017	U	0.00016	U	0.00016	U	0.00015	U	0.00017	U	0.00015	U	0.00017	U
1,3-Dichlorobenzene	mg/kg	280	2.6	0.00019	U	0.00017	U	0.00017	U	0.00016	U	0.00018	U	0.00016	U	0.00019	U
1,4-Dichlorobenzene	mg/kg	130	1.8	0.00013	U	0.00011	U	0.00012	U	0.00011	U	0.00013	U	0.00011	U	0.00013	U
2-Butanone (MEK)	mg/kg	500	0.10	0.00073	U	0.00065	U	0.00067	U	0.00064	U	0.00072	U	0.0017	J	0.0012	J
2-Hexanone	mg/kg	NS	NS	0.00015	U	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.00013	U	0.00015	U
4-Methyl-2-pentanone (MIBK)	mg/kg	NS	NS	0.00023	U	0.00021	U	0.00021	U	0.0002	U	0.00023	U	0.0002	U	0.00023	U
Acetone	mg/kg	500	0.03	0.0072	J B	0.0053	J B	0.009	J B	0.0083	J B	0.02	B	0.014	B	0.011	J B
Benzene	mg/kg	20	0.06	0.00017	U	0.00064	J	0.00016	U	0.0017		0.00017	U	0.00018	J	0.00017	U
Bromodichloromethane	mg/kg	NS	NS	0.00037	U	0.00033	U	0.00034	U	0.00033	U	0.00037	U	0.00033	U	0.00037	U
Bromoform	mg/kg	NS	NS	0.0002	U	0.00018	U	0.00018	U	0.00017	U	0.0002	U	0.00017	U	0.0002	U
Bromomethane	mg/kg	NS	NS	0.0005	U	0.00045	U	0.00046	U	0.00044	U	0.00049	U	0.00044	U	0.0005	U
Carbon disulfide	mg/kg	NS	NS	0.00017	U	0.00032	J	0.0025		0.0018		0.0035		0.00022	J	0.0025	
Carbon tetrachloride	mg/kg	41	0.76	0.00017	U	0.00016	U	0.00016	U	0.00015	U	0.00017	U	0.00015	U	0.00017	U
Chlorobenzene	mg/kg	500	1.1	0.00021	U	0.00019	U	0.00019	U	0.00018	U	0.00021	U	0.00018	U	0.00021	U
Chloroethane	mg/kg	NS	NS	0.00038	U	0.00034	U	0.00035	U	0.00034	U	0.00038	U	0.00034	U	0.00038	U
Chloroform	mg/kg	180	0.37	0.00028	U	0.00025	U	0.00026	U	0.00025	U	0.00028	U	0.00024	U	0.00028	U
Chloromethane	mg/kg	NS	NS	0.00019	U	0.00017	U	0.00017	U	0.00016	U	0.00018	U	0.00016	U	0.00019	U
cis-1,2-Dichloroethene	mg/kg	500	0.19	0.00013	U	0.00011	U	0.00012	U	0.00011	U	0.00013	U	0.00011	U	0.00013	U
cis-1,3-Dichloropropene	mg/kg	NS	NS	0.00016	U	0.00015	U	0.00015	U	0.00014	U	0.00016	U	0.00014	U	0.00016	U
Cyclohexane	mg/kg	NS	NS	0.00015	U	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.00013	U	0.00015	U
Dibromochloromethane	mg/kg	NS	NS	0.00012	U	0.0001	U	0.00011	U	0.0001	U	0.00012	U	0.0001	U	0.00012	U
Dichlorodifluoromethane	mg/kg	NS	NS	0.00026	U	0.00023	U	0.00024	U	0.00022	U	0.00025	U	0.00022	U	0.00026	U
Ethylbenzene	mg/kg	390	1.0	0.0002	U	0.00018	U	0.00018	U	0.00052	J	0.056		0.00017	U	0.0002	U
Freon TF	mg/kg	NS	NS	0.00013	U	0.00011	U	0.00012	U	0.00011	U	0.00013	U	0.00011	U	0.00013	U
Isopropylbenzene	mg/kg	NS	NS	0.00013	U	0.00011	U	0.00012	U	0.00011	U	0.0032		0.00011	U	0.00013	U
Methyl acetate	mg/kg	NS	NS	0.00037	U	0.00033	U	0.00034	U	0.00033	U	0.00037	U	0.00033	U	0.00037	U
Methylcyclohexane	mg/kg	NS	NS	0.00012	U	0.0001	U	0.00011	U	0.0001	U	0.00012	U	0.0001	U	0.00012	U
Methylene Chloride	mg/kg	500	0.05	0.0048	B	0.0016	B	0.0011	B	0.0047	B	0.013	B	0.0058	B	0.0044	B
Methyl tert-butyl ether (MTBE)	mg/kg	500	0.1	0.00038	J	0.00011	U	0.00012	U	0.00011	U	0.00013	U	0.00011	U	0.00013	U
Styrene	mg/kg	NS	NS	0.00033	U	0.00029	J	0.0003	U	0.021		0.00032	U	0.00099	J	0.00033	U
Tetrachloroethene	mg/kg	81	1.30	0.00014	U	0.00084	J	0.00013	U	0.032		0.00014	U	0.0019		0.00014	U
Toluene	mg/kg	500	0.70	0.00026	J	0.00094	J	0.00015	U	0.0025		0.0021		0.00071	J	0.00022	J
trans-1,2-Dichloroethene	mg/kg	500	0.19	0.00015	U	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.00013	U	0.00015	U
trans-1,3-Dichloropropene	mg/kg	NS	NS	0.00012	U	0.0001	U	0.00011	U	0.0001	U	0.00012	U	0.0001	U	0.00012	U
Trichloroethene	mg/kg	54	0.47	0.00014	U	0.00012	U	0.00013	U	0.0015		0.00014	U	0.00012	U	0.00014	U
Trichlorofluoromethane	mg/kg	NS	NS	0.00019	U	0.00017	U	0.00017	U	0.00016	U	0.00018	U	0.00016	U	0.00019	U
Vinyl chloride	mg/kg	7.1	0.03	0.0004	U	0.00035	U	0.00036	U	0.00035	U	0.00039	U	0.00035	U	0.0004	U
Xylenes, Total	mg/kg	500	1.2	0.00078	U	0.0007	U	0.00072	U	0.002	J	0.025		0.00068	U	0.00078	U
Total Confident Conc.	mg/Kg			0.01264		0.00993		0.0126		0.07602		0.1228		0.0255		0.01932	
Total Estimated Conc. (TICs)	mg/Kg			0		0.0129		0		0.1569		1.1133		0		0.0943	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
J = Concentration is an approximate value.
B = Compound found in the blank and sample
** Positive and "not detected" VOC results for MW-105 (21-22) should be considered estimated (J)
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019

Bold = Concentration exceeds Protection of Groundwater Soil Cleanup Objectives
Bold = Concentration exceeds Commercial Soil Cleanup Objectives
Bold = Concentration exceeds both Protection of Groundwater and Commercial Soil Cleanup Objectives
NS = No Standard

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives: Commercial SCOs	NYSDEC Soil Cleanup Objectives: Protection of Groundwater SCO																								
Sample ID				**GP-1(3.6'-3.8')**		**GP-1(6.0'-6.2')**		**GP-2(3.0'-3.2')**		**GP-2(6.0'-6.2')**		**GP-3(2.7'-2.9')**		**GP-3(5.9'-6.1')**		**GP-4(1.4'-1.6')**		**GP-4(5.8'-6.0')**		**GP-5(3.3'-3.5')**		**GP-5(5.9'-6.1')**		**GP-6(2.5'-2.7')**		**GP-6(5.5'-5.7')**	
Laboratory ID				460-97334-18		460-97334-19		460-97334-14		460-97334-15		460-97334-13		460-97334-21		460-97334-11		460-97334-12		460-97334-9		460-97334-10		460-97334-5		460-97334-6	
Sampling Date	feet			7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015		7/1/2015	
Matrix				Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Dilution Factor				50		50		50		50		50		50		50		50		50		50		50		50	
Volatile Organic Compounds (VOCs) by EPA Method 8260B				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	mg/Kg	500	0.68	0.032	U	0.031	U	0.033	U	0.03	U	0.027	U	0.034	U	0.036	U	0.029	U	0.032	U	0.031	U	0.040	U	0.032	U
1,1,2,2-Tetrachloroethane	mg/Kg	NS	NS	0.022	U	0.021	U	0.023	U	0.021	U	0.018	U	0.023	U	0.024	U	0.019	U	0.021	U	0.021	U	0.027	U	0.022	U
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/Kg	NS	NS	0.038	U	0.037	U	0.041	U	0.037	U	0.032	U	0.042	U	0.043	U	0.035	U	0.038	U	0.038	U	0.049	U	0.039	U
1,1,2-Trichloroethane	mg/Kg	NS	NS	0.0091	U	0.0088	U	0.0096	U	0.0086	U	0.0076	U	0.0098	U	0.010	U	0.0082	U	0.0090	U	0.0089	U	0.011	U	0.0091	U
1,1-Dichloroethane	mg/Kg	240	0.27	0.027	U	0.026	U	0.029	U	0.026	U	0.023	U	0.029	U	0.031	U	0.025	U	0.027	U	0.027	U	0.034	U	0.027	U
1,1-Dichloroethene	mg/Kg	5.1	0.33	0.038	U	0.037	U	0.041	U	0.037	U	0.032	U	0.042	U	0.043	U	0.035	U	0.038	U	0.038	U	0.049	U	0.039	U
1,2,3-Trichlorobenzene	mg/Kg	NS	NS	0.04	U	0.038	U	0.042	U	0.038	U	0.033	U	0.043	U	0.045	U	0.036	U	0.039	U	0.039	U	0.050	U	0.040	U
1,2,4-Trichlorobenzene	mg/Kg	NS	NS	0.031	U	0.03	U	0.032	U	0.029	U	0.026	U	0.033	U	0.034	U	0.028	U	0.030	U	0.030	U	0.039	U	0.031	U
1,2-Dibromo-3-Chloropropane	mg/Kg	NS	NS	0.026	U	0.025	U	0.027	U	0.025	U	0.022	U	0.028	U	0.029	U	0.024	U	0.026	U	0.026	U	0.033	U	0.026	U
1,2-Dichlorobenzene	mg/Kg	500	1.1	0.025	U	0.024	U	0.026	U	0.024	U	0.021	U	0.027	U	0.028	U	0.023	U	0.025	U	0.025	U	0.032	U	0.025	U
1,2-Dichloroethane	mg/Kg	30	0.02	0.028	U	0.027	U	0.03	U	0.027	U	0.024	U	0.031	U	0.032	U	0.026	U	0.028	U	0.028	U	0.036	U	0.028	U
1,2-Dichloropropane	mg/Kg	NS	NS	0.02	U	0.02	U	0.022	U	0.019	U	0.017	U	0.022	U	0.023	U	0.018	U	0.020	U	0.020	U	0.026	U	0.020	U
1,3-Dichlorobenzene	mg/Kg	280	2.6	0.037	U	0.036	U	0.039	U	0.036	U	0.031	U	0.040	U	0.042	U	0.034	U	0.037	U	0.037	U	0.047	U	0.038	U
1,4-Dichlorobenzene	mg/Kg	130	1.8	0.037	U	0.036	U	0.039	U	0.036	U	0.031	U	0.040	U	0.042	U	0.034	U	0.037	U	0.037	U	0.047	U	0.038	U
1,4-Dioxane	mg/Kg	130	0.1	0.98	U	0.95	U	1.0	U	0.94	U	0.83	U	1.1	U	1.1	U	0.89	U	0.98	U	0.97	U	1.2	U	0.99	U
2-Butanone (MEK)	mg/Kg	500	0.10	0.25	U	0.24	U	0.26	U	0.24	U	0.21	U	0.27	U	0.28	U	0.23	U	0.25	U	0.25	U	0.32	U	0.25	U
2-Hexanone	mg/Kg	NS	NS	0.082	U	0.079	U	0.086	U	0.078	U	0.069	U	0.088	U	0.092	U	0.074	U	0.081	U	0.080	U	0.10	U	0.082	U
4-Methyl-2-pentanone (MIBK)	mg/Kg	NS	NS	0.071	U	0.069	U	0.075	U	0.068	U	0.060	U	0.077	U	0.080	U	0.065	U	0.071	U	0.070	U	0.090	U	0.072	U
Acetone	mg/Kg	500	0.03	0.12	U	0.12	U	0.13	U	0.12	U	0.10	U	0.13	U	0.14	U	0.11	U	0.12	U	0.12	U	0.15	U	0.12	U
Benzene	mg/Kg	20	0.06	0.022	U	0.021	U	**0.14**		**0.13**		0.018	U	0.023	U	0.045	J	0.019	U	0.021	U	0.021	U	**0.15**		0.022	U
Bromoform	mg/Kg	NS	NS	0.02	U	0.02	U	0.022	U	0.019	U	0.017	U	0.022	U	0.023	U	0.018	U	0.020	U	0.020	U	0.026	U	0.020	U
Bromomethane	mg/Kg	NS	NS	0.02	U	0.02	U	0.022	U	0.019	U	0.017	U	0.022	U	0.023	U	0.018	U	0.020	U	0.020	U	0.026	U	0.020	U
Carbon disulfide	mg/Kg	NS	NS	0.025	U	0.024	U	0.026	U	0.024	U	0.021	U	0.027	U	0.028	U	0.023	U	0.025	U	0.025	U	0.032	U	0.025	U
Carbon tetrachloride	mg/Kg	41	0.76	0.037	U	0.036	U	0.039	U	0.036	U	0.031	U	0.04	U	0.042	U	0.034	U	0.037	U	0.037	U	0.047	U	0.038	U
Chlorobenzene	mg/Kg	500	1.1	0.027	U	0.026	U	0.029	U	0.026	U	0.023	U	0.029	U	0.031	U	0.025	U	0.027	U	0.027	U	0.034	U	0.027	U
Chlorobromomethane	mg/Kg	NS	NS	0.034	U	0.033	U	0.036	U	0.032	U	0.029	U	0.037	U	0.038	U	0.031	U	0.034	U	0.033	U	0.043	U	0.034	U
Chlorodibromomethane	mg/Kg	NS	NS	0.025	U	0.024	U	0.026	U	0.024	U	0.021	U	0.027	U	0.028	U	0.023	U	0.025	U	0.025	U	0.032	U	0.025	U
Chloroethane	mg/Kg	NS	NS	0.042	U	0.041	U	0.044	U	0.04	U	0.035	U	0.045	U	0.047	U	0.038	U	0.042	U	0.041	U	0.053	U	0.042	U
Chloroform	mg/Kg	180	0.37	0.025	U	0.024	U	0.026	U *	0.024	U *	0.021	U	0.027	U	0.028	U	0.023	U	0.025	U	0.025	U	0.032	U	0.025	U
Chloromethane	mg/Kg	NS	NS	0.025	U	0.024	U	0.026	U	0.024	U	0.021	U	0.027	U	0.028	U	0.023	U	0.025	U	0.025	U	0.032	U	0.025	U
cis-1,2-Dichloroethene	mg/Kg	500	0.19	0.029	U	0.029	U	0.031	U	0.028	U	0.025	U	0.032	U	0.033	U	0.027	U	0.029	U	0.029	U	**4.2**		0.067	J
cis-1,3-Dichloropropene	mg/Kg	NS	NS	0.018	U	0.018	U	0.019	U	0.017	U	0.015	U	0.02	U	0.020	U	0.016	U	0.018	U	0.018	U	0.023	U	0.018	U
Cyclohexane	mg/Kg	NS	NS	0.029	U	0.029	U	0.031	U	0.028	U	0.025	U	0.032	U	0.033	U	0.027	U	0.029	U	0.029	U	0.037	U	0.030	U
Dichlorobromomethane	mg/Kg	NS	NS	0.017	U	0.016	U	0.018	U	0.016	U	0.014	U	0.018	U	0.019	U	0.015	U	0.017	U	0.017	U	0.022	U	0.017	U
Dichlorodifluoromethane	mg/Kg	NS	NS	0.016	U	0.015	U	0.017	U	0.015	U	0.013	U	0.017	U	0.018	U	0.014	U	0.016	U	0.016	U	0.020	U	0.016	U
Ethylbenzene	mg/Kg	390	1.0	0.034	U	0.033	U	0.036	U	0.032	U	0.029	U	0.037	U	0.038	U	0.031	U	0.034	U	0.033	U	0.043	U	0.034	U
Ethylene Dibromide	mg/Kg	NS	NS	0.022	U	0.021	U	0.023	U	0.021	U	0.018	U	0.023	U	0.024	U	0.019	U	0.021	U	0.021	U	0.027	U	0.022	U
Isopropylbenzene	mg/Kg	NS	NS	0.036	U	0.035	U	0.038	U	0.035	U	0.031	U	0.039	U	0.041	U	0.033	U	0.036	U	0.036	U	0.046	U	0.036	U
Methyl acetate	mg/Kg	NS	NS	0.066	U	0.064	U	0.069	U	0.063	U	0.055	U	0.071	U	0.074	U	0.060	U	0.065	U	0.065	U	0.083	U	0.066	U
Methylcyclohexane	mg/Kg	NS	NS	0.025	U	0.024	U	0.026	U	0.024	U	0.036	J	0.057	J	0.028	U	0.023	U	0.025	U	0.025	U	0.047	J	0.025	U
Methylene Chloride	mg/Kg	500	0.05	0.024	U	0.023	U	0.025	U *	0.023	U *	0.020	U	0.026	U	0.027	U	0.022	U	0.024	U	0.023	U	0.030	U	0.024	U
Methyl tert-butyl ether	mg/Kg	500	0.1	0.015	U	0.014	U	0.016	U	0.014	U	0.012	U	0.016	U	0.017	U	0.013	U	0.015	U	0.014	U	0.019	U	0.015	U
Styrene	mg/Kg	NS	NS	0.019	U	0.019	U	0.11	J	0.071	J	0.016	U	0.021	U	0.022	U	0.017	U	0.019	U	0.019	U	0.077	J	0.027	J
Tetrachloroethene	mg/Kg	81	1.30	0.041	U	0.039	U	**3.4**		**2.4**		0.14		0.14		**18**		0.037	U	**5.8**		0.040	U	**21**		**6.6**	
Toluene	mg/Kg	500	0.70	0.028	U	0.027	U	0.23		0.22		0.13		0.031	J	0.080	J	0.026	U	0.028	U	0.028	U	0.28		0.028	U
trans-1,2-Dichloroethene	mg/Kg	500	0.19	0.02	U	0.02	U	0.022	U	0.019	U	0.017	U	0.022	U	0.023	U	0.018	U	0.020	U	0.020	U	**0.54**		0.020	U
trans-1,3-Dichloropropene	mg/Kg	NS	NS	0.022	U	0.021	U	0.023	U	0.021	U	0.018	U	0.023	U	0.024	U	0.019	U	0.021	U	0.021	U	0.027	U	0.022	U
Trichloroethene	mg/Kg	54	0.47	0.025	U	0.024	U	0.052	J	0.026	J	0.021	U	0.027	U	0.059	J	0.023	U	0.043	J	0.025	U	**0.94**		0.096	J
Trichlorofluoromethane	mg/Kg	NS	NS	0.017	U	0.016	U	0.018	U	0.016	U	0.014	U	0.018	U	0.019	U	0.015	U	0.017	U	0.017	U	0.022	U	0.017	U
Vinyl chloride	mg/Kg	7.1	0.03	0.023	U	0.022	U	0.024	U	0.022	U	0.019	U	0.024	U	0.026	U	0.021	U	0.023	U	0.022	U	0.029	U	0.023	U
m-Xylene & p-Xylene	mg/Kg	500	1.2	0.032	U	0.031	U	0.13		0.10	J	0.027	U	0.034	U	0.036	U	0.029	U	0.032	U	0.031	U	0.15		0.032	U
o-Xylene	mg/Kg	500	1.2	0.036	U	0.035	U	0.038	U	0.035	U	0.031	U	0.039	U	0.041	U	0.033	U	0.036	U	0.036	U	0.046	U	0.036	U
Total Conc	mg/Kg			0.0		0.0		4.062		2.947		0.306		0.228		18.184		0.0		5.843		0.0		27.384		6.79	
Total Estimated Conc. (TICs)	mg/Kg			0.0*T		0.0*T		0.82		0.87		0.0*T		2.8		0.0*T		0.0*T		0.0*T		0.0*T		0.75		0.0*T	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
J = Concentration is an approximate value.
B = Compound found in the blank and sample
** Positive and "not detected" VOC results for MW-105 (21-22) should be considered estimated (J)
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019

Bold = Concentration exceeds Protection of Groundwater Soil Cleanup Objectives
Bold = Concentration exceeds Commercial Soil Cleanup Objectives
Bold = Concentration exceeds both Protection of Groundwater and Commercial Soil Cleanup Objectives
NS = No Standard

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives: Commercial SCOs	NYSDEC Soil Cleanup Objectives: Protection of Groundwater SCO								
Sample ID				**GP-7(3.8'-4.0')**		**GP-7(6.6'-6.8')**		**GP-8(2.1'-2.3')**		**GP-8(6.3'-6.5')**	
Laboratory ID				460-97334-2		460-97334-3		460-97334-7		460-97334-8	
Sampling Date	feet			7/1/2015		7/1/2015		7/1/2015		7/1/2015	
Matrix				Soil		Soil		Soil		Soil	
Dilution Factor				50		50		100		50	
Volatile Organic Compounds (VOCs) by EPA Method 8260B				Result	Q	Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	mg/Kg	500	0.68	0.031	U	0.030	U	0.062	U	0.031	U
1,1,2,2-Tetrachloroethane	mg/Kg	NS	NS	0.021	U	0.021	U	0.042	U	0.021	U
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/Kg	NS	NS	0.038	U	0.037	U	0.075	U	0.037	U
1,1,2-Trichloroethane	mg/Kg	NS	NS	0.0090	U	0.0087	U	0.018	U	0.0088	U
1,1-Dichloroethane	mg/Kg	240	0.27	0.027	U	0.026	U	0.053	U	0.026	U
1,1-Dichloroethene	mg/Kg	5.1	0.33	0.038	U	0.037	U	0.075	U	0.037	U
1,2,3-Trichlorobenzene	mg/Kg	NS	NS	0.039	U	0.038	U	0.078	U	0.038	U
1,2,4-Trichlorobenzene	mg/Kg	NS	NS	0.030	U	0.029	U	0.060	U	0.030	U
1,2-Dibromo-3-Chloropropane	mg/Kg	NS	NS	0.026	U	0.025	U	0.051	U	0.025	U
1,2-Dichlorobenzene	mg/Kg	500	1.1	0.025	U	0.024	U	0.049	U	0.024	U
1,2-Dichloroethane	mg/Kg	30	0.02	0.028	U	0.027	U	0.055	U	0.027	U
1,2-Dichloropropane	mg/Kg	NS	NS	0.020	U	0.020	U	0.040	U	0.020	U
1,3-Dichlorobenzene	mg/Kg	280	2.6	0.037	U	0.036	U	0.073	U	0.036	U
1,4-Dichlorobenzene	mg/Kg	130	1.8	0.037	U	0.036	U	0.073	U	0.036	U
1,4-Dioxane	mg/Kg	130	0.1	0.98	U	0.94	U	1.9	U	0.96	U
2-Butanone (MEK)	mg/Kg	500	0.10	0.25	U	0.24	U	0.49	U	0.24	U
2-Hexanone	mg/Kg	NS	NS	0.081	U	0.078	U	0.16	U	0.079	U
4-Methyl-2-pentanone (MIBK)	mg/Kg	NS	NS	0.071	U	0.068	U	0.14	U	0.069	U
Acetone	mg/Kg	500	0.03	0.12	U	0.12	U	0.24	U	0.12	U
Benzene	mg/Kg	20	0.06	0.021	U	0.021	U	**0.11**	J	0.021	U
Bromoform	mg/Kg	NS	NS	0.020	U	0.020	U	0.040	U	0.020	U
Bromomethane	mg/Kg	NS	NS	0.020	U	0.020	U	0.040	U	0.020	U
Carbon disulfide	mg/Kg	NS	NS	0.025	U	0.024	U	0.049	U	0.024	U
Carbon tetrachloride	mg/Kg	41	0.76	0.037	U	0.036	U	0.073	U	0.036	U
Chlorobenzene	mg/Kg	500	1.1	0.027	U	0.026	U	0.053	U	0.026	U
Chlorobromomethane	mg/Kg	NS	NS	0.034	U	0.033	U	0.066	U	0.033	U
Chlorodibromomethane	mg/Kg	NS	NS	0.025	U	0.024	U	0.049	U	0.024	U
Chloroethane	mg/Kg	NS	NS	0.042	U	0.040	U	0.082	U	0.041	U
Chloroform	mg/Kg	180	0.37	0.025	U	0.024	U	0.049	U	0.024	U
Chloromethane	mg/Kg	NS	NS	0.025	U	0.024	U	0.049	U	0.024	U
cis-1,2-Dichloroethene	mg/Kg	500	0.19	0.066	J	0.028	U	0.16	J	0.029	U
cis-1,3-Dichloropropene	mg/Kg	NS	NS	0.018	U	0.017	U	0.035	U	0.018	U
Cyclohexane	mg/Kg	NS	NS	0.029	U	0.028	U	0.058	U	0.029	U
Dichlorobromomethane	mg/Kg	NS	NS	0.017	U	0.016	U	0.033	U	0.016	U
Dichlorodifluoromethane	mg/Kg	NS	NS	0.016	U	0.015	U	0.031	U	0.015	U
Ethylbenzene	mg/Kg	390	1.0	0.034	U	0.033	U	0.066	U	0.033	U
Ethylene Dibromide	mg/Kg	NS	NS	0.021	U	0.021	U	0.042	U	0.021	U
Isopropylbenzene	mg/Kg	NS	NS	0.036	U	0.035	U	0.071	U	0.035	U
Methyl acetate	mg/Kg	NS	NS	0.065	U	0.063	U	0.13	U	0.064	U
Methylcyclohexane	mg/Kg	NS	NS	0.025	U	0.024	U	0.049	U	0.024	U
Methylene Chloride	mg/Kg	500	0.05	0.024	U	0.023	U	0.047	U	0.023	U
Methyl tert-butyl ether	mg/Kg	500	0.1	0.015	U	0.014	U	0.029	U	0.014	U
Styrene	mg/Kg	NS	NS	0.028	J	0.018	U	0.26		0.019	U
Tetrachloroethene	mg/Kg	81	1.30	**5.7**		0.039	U	**72**		0.040	U
Toluene	mg/Kg	500	0.70	0.028	U	0.027	U	0.17	J	0.027	U
trans-1,2-Dichloroethene	mg/Kg	500	0.19	0.020	U	0.020	U	0.040	U	0.020	U
trans-1,3-Dichloropropene	mg/Kg	NS	NS	0.021	U	0.021	U	0.042	U	0.021	U
Trichloroethene	mg/Kg	54	0.47	0.076	J	0.024	U	0.33		0.024	U
Trichlorofluoromethane	mg/Kg	NS	NS	0.017	U	0.016	U	0.033	U	0.016	U
Vinyl chloride	mg/Kg	7.1	0.03	0.022	U	**0.048**	J	0.044	U	0.022	U
m-Xylene & p-Xylene	mg/Kg	500	1.2	0.031	U	0.030	U	0.16	J	0.031	U
o-Xylene	mg/Kg	500	1.2	0.036	U	0.035	U	0.071	U	0.035	U
Total Conc	mg/Kg			5.87		0.048		73.19		0.0	
Total Estimated Conc. (TICs)	mg/Kg			0.0*T		0.0*T		8.1		0.0*T	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
J = Concentration is an approximate value.
B = Compound found in the blank and sample
** Positive and "not detected" VOC results for MW-105 (21-22) should be considered estimated (J)
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019

Bold = Concentration exceeds Protection of Groundwater Soil Cleanup Objectives
Bold = Concentration exceeds Commercial Soil Cleanup Objectives
Bold = Concentration exceeds both Protection of Groundwater and Commercial Soil Cleanup Objectives
NS = No Standard

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives: Commercial SCOs	NYSDEC Soil Cleanup Objectives: Protection of Groundwater SCO																								
Sample ID				MW-101(5.0'-6.0')		MW-101(27.6'-28.6')		MW-102(6.6'-7.2')		MW-102(22.0'-23.0')		MW-103 (5.2'-6.2')		MW-103 (25'-26')		MW-104(6.3'-6.9')		MW-104(37'-38')		MW-105(5.0'-5.8')		MW-105(21'-22')		MW-106(6.0'-7.0')		MW-106(16.0'-17.0')	
Lab Sample No.				460-00040154-005		460-00040154-006		460-00040154-003		460-00040154-004		460-00040261-001		460-00040261-002		460-00040154-001		460-00040154-002		460-00040154-011		460-00040154-012		460-00040154-009		460-00040154-010	
Sampling Date				5/10/2012		5/10/2012		5/9/2012		5/9/2012		5/11/2012		5/11/2012		5/8/2012		5/8/2012		5/11/2012		5/11/2012		5/11/2012		5/11/2012	
Matrix				Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor				1		1		20		1		1		1		2		1		2		1		1		1	
SEMIVOLATILE COMPOUNDS (GC/MS)				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4,5-Trichlorophenol	mg/Kg	NS	NS	0.047	U	0.052	U	0.95	U	0.053	U	0.045	U	0.052	U	0.1	U	0.05	U	0.093	U	0.052	U	0.044	U	0.053	U
2,4,6-Trichlorophenol	mg/Kg	NS	NS	0.043	U	0.048	U	0.86	U	0.048	U	0.041	U	0.047	U	0.093	U	0.045	U	0.084	U	0.047	U	0.04	U	0.048	U
2,4-Dichlorophenol	mg/Kg	NS	NS	0.054	U	0.059	U	1.1	U	0.06	U	0.051	U	0.059	U	0.12	U	0.057	U	0.11	U	0.059	U	0.05	U	0.06	U
2,4-Dimethylphenol	mg/Kg	NS	NS	0.091	U	0.1	U	1.8	U	0.1	U	0.086	U	0.1	U	0.2	U	0.095	U	0.18	U	0.1	U	0.085	U	0.1	U
2,4-Dinitrophenol	mg/Kg	NS	NS	0.21	U	0.23	U	4.2	U	0.23	U	0.2	U	0.23	U	0.45	U	0.22	U	0.41	U	0.23	U	0.2	U	0.23	U
2,4-Dinitrotoluene	mg/Kg	NS	NS	0.012	U	0.013	U	0.24	U	0.014	U	0.011	U	0.013	U	0.026	U	0.013	U	0.024	U	0.013	U	0.011	U	0.013	U
2,6-Dinitrotoluene	mg/Kg	NS	NS	0.011	U	0.012	U	0.22	U	0.012	U	0.01	U	0.012	U	0.024	U	0.012	U	0.022	U	0.012	U	0.01	U	0.012	U
2-Chloronaphthalene	mg/Kg	NS	NS	0.041	U	0.045	U	0.82	U	0.046	U	0.039	U	0.045	U	0.089	U	0.043	U	0.08	U	0.045	U	0.038	U	0.045	U
2-Chlorophenol	mg/Kg	NS	NS	0.048	U	0.053	U	0.97	U	0.054	U	0.046	U	0.053	U	0.1	U	0.051	U	0.095	U	0.053	U	0.045	U	0.053	U
2-Methylnaphthalene	mg/Kg	NS	NS	0.047	U	0.052	U	1.2	J	0.053	U	0.14	J	0.052	U	0.47	J	0.05	U	0.82		0.052	U	0.044	U	0.052	U
2-Methylphenol	mg/Kg	NS	NS	0.063	U	0.069	U	1.3	U	0.07	U	0.059	U	0.069	U	0.14	U	0.066	U	0.12	U	0.069	U	0.059	U	0.069	U
2-Nitroaniline	mg/Kg	NS	NS	0.15	U	0.17	U	3.1	U	0.17	U	0.15	U	0.17	U	0.33	U	0.16	U	0.3	U	0.17	U	0.14	U	0.17	U
2-Nitrophenol	mg/Kg	NS	NS	0.041	U	0.045	U	0.82	U	0.046	U	0.039	U	0.045	U	0.089	U	0.043	U	0.08	U	0.045	U	0.038	U	0.045	U
3,3'-Dichlorobenzidine	mg/Kg	NS	NS	0.13	U	0.14	U	2.6	U	0.14	U	0.12	U	0.14	U	0.28	U	0.14	U	0.25	U	0.14	U	0.12	U	0.14	U
3-Nitroaniline	mg/Kg	NS	NS	0.13	U	0.14	U	2.6	U	0.15	U	0.12	U	0.14	U	0.28	U	0.14	U	0.25	U	0.14	U	0.12	U	0.14	U
4,6-Dinitro-2-methylphenol	mg/Kg	NS	NS	0.1	U	0.11	U	2	U	0.11	U	0.095	U	0.11	U	0.22	U	0.11	U	0.2	U	0.11	U	0.094	U	0.11	U
4-Bromophenyl phenyl ether	mg/Kg	NS	NS	0.036	U	0.04	U	0.73	U	0.041	U	0.034	U	0.04	U	0.079	U	0.038	U	0.071	U	0.04	U	0.034	U	0.04	U
4-Chloro-3-methylphenol	mg/Kg	NS	NS	0.055	U	0.061	U	1.1	U	0.062	U	0.052	U	0.061	U	0.12	U	0.058	U	0.11	U	0.061	U	0.052	U	0.061	U
4-Chloroaniline	mg/Kg	NS	NS	0.097	U	0.11	U	1.9	U	0.11	U	0.092	U	0.11	U	0.21	U	0.1	U	0.19	U	0.11	U	0.091	U	0.11	U
4-Chlorophenyl phenyl ether	mg/Kg	NS	NS	0.043	U	0.048	U	0.86	U	0.048	U	0.041	U	0.047	U	0.094	U	0.045	U	0.084	U	0.048	U	0.04	U	0.048	U
4-Methylphenol	mg/Kg	NS	NS	0.072	U	0.08	U	1.4	U	0.081	U	0.068	U	0.079	U	0.16	U	0.076	U	0.14	U	0.08	U	0.068	U	0.08	U
4-Nitroaniline	mg/Kg	NS	NS	0.11	U	0.13	U	2.3	U	0.13	U	0.11	U	0.13	U	0.25	U	0.12	U	0.22	U	0.13	U	0.11	U	0.13	U
4-Nitrophenol	mg/Kg	NS	NS	0.24	U	0.26	U	4.7	U	0.26	U	0.22	U	0.26	U	0.51	U	0.25	U	0.46	U	0.26	U	0.22	U	0.26	U
Acenaphthene	mg/Kg	500	98	0.054	U	0.059	U	1.1	U	0.06	U	0.11	J	0.059	U	0.28	J	0.056	U	0.1	U	0.059	U	0.05	U	0.059	U
Acenaphthylene	mg/Kg	500	365	0.17	J	0.048	U	8.4		0.049	U	0.95		0.048	U	2.1		0.046	U	1.2		0.048	U	0.13	J	0.048	U
Acetophenone	mg/Kg	NS	NS	0.056	U	0.062	U	1.1	U	0.063	U	0.053	U	0.062	U	0.12	U	0.059	U	0.11	U	0.062	U	0.053	U	0.062	U
Anthracene	mg/Kg	500	1000	0.074	J	0.049	U	5.7	J	0.05	U	1.4		0.049	U	2.6		0.047	U	1.1		0.049	U	0.042	U	0.049	U
Atrazine	mg/Kg	NS	NS	0.057	U	0.063	U	1.1	U	0.064	U	0.054	U	0.062	U	0.12	U	0.06	U	0.11	U	0.063	U	0.053	U	0.063	U
Benzaldehyde	mg/Kg	NS	NS	0.043	U	0.048	U	0.86	U	0.048	U	0.041	U	0.047	U	0.094	U	0.046	U	0.085	U	0.048	U	0.04	U	0.048	U
Benzo[a]anthracene	mg/Kg	37	1	0.71		0.0028	U	**53**		0.0029	U	**3.3**		0.0028	U	**6.4**		0.0027	U	**3.8**		0.0028	U	0.29		0.0028	U
Benzo[a]pyrene	mg/Kg	3.7	22	0.62		0.0029	U	**40**		0.0029	U	3.1		0.0029	U	**6.0**		0.0027	U			0.0029	U	0.037		0.0029	U
Benzo[b]fluoranthene	mg/Kg	37	2.1	0.58		0.0026	U	**34**		0.0026	U	**3.1**		0.0026	U	**5.6**		0.0024	U	**3.1**		0.0026	U	0.23		0.0026	U
Benzo[g,h,i]perylene	mg/Kg	47	1000	0.55		0.03	U	25		0.03	U	2.2		0.03	U	4.6		0.029	U	2.1		0.03	U	0.11	J	0.03	U
Benzo[k]fluoranthene	mg/Kg	47	2	0.26		0.0031	U	**14**		0.0031	U	0.99		0.0031	U	2.0		0.0029	U	1		0.0031	U	0.085		0.0031	U
bis (2-chloroisopropyl) ether	mg/Kg	NS	NS	0.041	U	0.045	U	0.81	U	0.046	U	0.038	U	0.045	U	0.088	U	0.043	U	0.08	U	0.045	U	0.038	U	0.045	U
Bis(2-chloroethoxy)methane	mg/Kg	NS	NS	0.047	U	0.052	U	0.95	U	0.053	U	0.045	U	0.052	U	0.1	U	0.05	U	0.093	U	0.052	U	0.044	U	0.053	U
Bis(2-chloroethyl)ether	mg/Kg	NS	NS	0.005	U	0.0055	U	0.1	U	0.0056	U	0.0047	U	0.0055	U	0.011	U	0.0053	U	0.0098	U	0.0055	U	0.0047	U	0.0055	U
Bis(2-ethylhexyl) phthalate	mg/Kg	NS	NS	0.12	U	0.14	U	2.4	U	0.14	U	0.12	U	0.13	U	2.9		0.13	U	0.24	U	0.13	U	0.11	U	0.14	U
Butyl benzyl phthalate	mg/Kg	NS	NS	0.034	U	0.037	U	0.67	U	0.038	U	0.032	U	0.037	U	3.7		0.035	U	0.066	U	0.037	U	0.031	U	0.037	U
Caprolactam	mg/Kg	NS	NS	0.085	U	0.094	U	1.7	U	0.095	U	0.08	U	0.093	U	0.18	U	0.089	U	0.17	U	0.093	U	0.079	U	0.094	U
Carbazole	mg/Kg	NS	NS	0.043	U	0.048	U	0.87	U	0.049	U	0.041	U	0.048	U	0.1	J	0.046	U	0.085	U	0.048	U	0.041	U	0.048	U
Chrysene	mg/Kg	47	1	0.86		0.047	U	**55**		0.048	U	**4.0**		0.047	U	**7.4**		0.045	U	**4.6**		0.047	U	0.44		0.047	U
Dibenz(a,h)anthracene	mg/Kg	3.7	1000	0.12		0.0051	U	**7.2**		0.0052	U	0.55		0.0051	U	**1.3**		0.0049	U	0.62		0.0051	U	0.0043	U	0.0051	U
Dibenzofuran	mg/Kg	180	110	0.043	U	0.048	U	0.86	U	0.048	U	0.041	U	0.047	U	0.094	U	0.045	U	0.089	J	0.048	U	0.04	U	0.048	U
Diethyl phthalate	mg/Kg	NS	NS	0.044	U	0.048	U	0.87	U	0.049	U	0.041	U	0.048	U	0.095	U	0.046	U	0.086	U	0.048	U	0.041	U	0.048	U
Dimethyl phthalate	mg/Kg	NS	NS	0.044	U	0.048	U	0.87	U	0.049	U	0.041	U	0.048	U	0.095	U	0.046	U	0.085	U	0.048	U	0.041	U	0.048	U
Di-n-butyl phthalate	mg/Kg	NS	NS	0.045	U	0.05	U	0.91	U	0.051	U	0.043	U	0.05	U	0.098	U	0.048	U	0.089	U	0.05	U	0.042	U	0.05	U
Di-n-octyl phthalate	mg/Kg	NS	NS	0.023	U	0.026	U	0.47	U	0.026	U	0.022	U	0.026	U	0.051	U	0.025	U	0.046	U	0.026	U	0.022	U	0.026	U
Diphenyl	mg/Kg	NS	NS	0.049	U	0.054	U	0.98	U	0.055	U	0.047	U	0.054	U	0.16	J	0.052	U	0.12	J	0.054	U	0.046	U	0.054	U
Fluoranthene	mg/Kg	500	1000	0.51		0.054	U	66		0.055	U	4.6		0.054	U	7.9		0.052	U	4		0.054	U	0.56		0.054	U
Fluorene	mg/Kg	500	386	0.047	U	0.052	U	1.8	J	0.053	U	0.57		0.052	U	1.7		0.049	U	0.85		0.052	U	0.091	J	0.052	U
Hexachlorobenzene	mg/Kg	1.8	3.2	0.005	U	0.0055	U	0.1	U	0.0056	U	0.0048	U	0.0055	U	0.011	U	0.0053	U	0.0098	U	0.0055	U	0.0047	U	0.0056	U
Hexachlorobutadiene	mg/Kg	NS	NS	0.009	U	0.0099	U	0.18	U	0.01	U	0.0085	U	0.0099	U	0.019	U	0.0094	U	0.018	U	0.0099	U	0.0084	U	0.0099	U
Hexachlorocyclopentadiene	mg/Kg	NS	NS	0.043	U	0.048	U	0.86	U	0.048	U	0.041	U	0.047	U	0.094	U	0.046	U	0.085	U	0.048	U	0.04	U	0.048	U
Hexachloroethane	mg/Kg	NS	NS	0.0041	U	0.0045	U	0.082	U	0.0046	U	0.0039	U	0.0045	U	0.0089	U	0.0043	U	0.008	U	0.0045	U	0.0038	U	0.0045	U
Indeno[1,2,3-cd]pyrene	mg/Kg	37	6.6	0.45		0.0075	U	**23**		0.0076	U	2		0.0075	U	4.1		0.0072	U	2		0.0075	U	0.11		0.0076	U
Isophorone	mg/Kg	NS	NS	0.045	U	0.049	U	0.89	U	0.05	U	0.042	U	0.049	U	0.097	U	0.047	U	0.087	U	0.049	U	0.042	U	0.049	U
Naphthalene	mg/Kg	500	12	0.043	U	0.047	U	0.85	U	0.048	U	0.1	J	0.047	U	0.19	J	0.045	U	0.37	J	0.047	U	0.097	J	0.047	U
Nitrobenzene	mg/Kg	NS	NS	0.0052	U	0.0058	U	0.1	U	0.0058	U	0.0049	U	0.0057	U	0.011	U	0.0055	U	0.01	U	0.0058	U	0.0049	U	0.0058	U
N-Nitrosodi-n-propylamine	mg/Kg	NS	NS	0.0061	U	0.0068	U	0.12	U	0.0069	U	0.0058	U	0.0067	U	0.013	U	0.0065	U	0.012	U	0.0068	U	0.0057	U	0.0068	U
N-Nitrosodiphenylamine	mg/Kg	NS	NS	0.036	U	0.04	U	0.72	U	0.041	U	0.034	U	0.04	U	0.079	U	0.038	U	0.071	U	0.04	U	0.034	U	0.04	U
Pentachlorophenol	mg/Kg	6.9	0.80	0.11	U	0.12	U	2.2	U	0.12	U	0.1	U	0.12	U	0.24	U	0.12	U	0.21	U	0.12	U	0.1	U	0.12	U
Phenanthrene	mg/Kg	47	1000	0.16	J	0.052	U	14		0.052	U	3.2		0.051	U	9.5		0.049	U	6.2		0.052	U	1.7		0.052	U
Phenol	mg/Kg	500	0.33	0.049	U	0.055	U	0.99	U	0.055	U	0.047	U	0.054	U	0.11	U	0.052	U	0.097	U	0.054	U	0.046	U	0.055	U
Pyrene	mg/Kg	500	1000	1.3		0.04	J	140		0.034	U	5.9		0.034	U	17		0.032	U	10		0.034	U	1.1		0.054	J
Total Confident Conc.	mg/Kg			6.364		0.04		488.3		0		36.21		0		86		0		45.169		0		4.98		0.054	
Total Estimated Conc. (TICs)	mg/Kg			4.98		1.3		435		0		0		0		41.4		0.68		36.2		1.3		26.06		0.54	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
J = Concentration is an approximate value.

B = Compound found in the blank and sample
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019
NS = No Standard

Bold = Concentration exceeds Protection of Groundwater Soil Cleanup Objectives
Bold = Concentration exceeds Commercial Soil Cleanup Objectives
Bold = Concentration exceeds both Protection of Groundwater and Commercial Soil Cleanup Objectives

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives							
		Commercial SCOs	Protection of Groundwater SCO						
Sample ID				MW-107(6.0'-6.9')		MW-107(25.0'-26.0')		GP-7 (7.5'-8.5')	
Lab Sample No.				460-00040154-007		460-00040154-008		460-97334-4	
Sampling Date				5/10/2012		5/10/2012		7/1/2015	
Matrix				Solid		Solid		Soil	
Dilution Factor				1		1		5	
SEMIVOLATILE COMPOUNDS (GC/MS)				Result	Q	Result	Q	Result	Q
2,4,5-Trichlorophenol	mg/Kg	NS	NS	0.051	U	0.054	U	0.20	U
2,4,6-Trichlorophenol	mg/Kg	NS	NS	0.046	U	0.049	U	0.057	U
2,4-Dichlorophenol	mg/Kg	NS	NS	0.058	U	0.061	U	0.048	U
2,4-Dimethylphenol	mg/Kg	NS	NS	0.098	U	0.1	U	0.44	U
2,4-Dinitrophenol	mg/Kg	NS	NS	0.22	U	0.24	U	1.5	U
2,4-Dinitrotoluene	mg/Kg	NS	NS	0.013	U	0.014	U	0.080	U
2,6-Dinitrotoluene	mg/Kg	NS	NS	0.012	U	0.013	U	0.11	U
2-Chloronaphthalene	mg/Kg	NS	NS	0.044	U	0.046	U	0.046	U
2-Chlorophenol	mg/Kg	NS	NS	0.052	U	0.055	U	0.051	U
2-Methylnaphthalene	mg/Kg	NS	NS	0.051	U	0.053	U	0.49	J
2-Methylphenol	mg/Kg	NS	NS	0.067	U	0.071	U	0.088	U
2-Nitroaniline	mg/Kg	NS	NS	0.17	U	0.17	U	0.066	U
2-Nitrophenol	mg/Kg	NS	NS	0.044	U	0.046	U	0.068	U
3,3'-Dichlorobenzidine	mg/Kg	NS	NS	0.14	U	0.15	U	0.22	U
3-Nitroaniline	mg/Kg	NS	NS	0.14	U	0.15	U	0.060	U
4,6-Dinitro-2-methylphenol	mg/Kg	NS	NS	0.11	U	0.11	U	0.54	U
4-Bromophenyl phenyl ether	mg/Kg	NS	NS	0.039	U	0.041	U	0.063	U
4-Chloro-3-methylphenol	mg/Kg	NS	NS	0.06	U	0.063	U	0.087	U
4-Chloroaniline	mg/Kg	NS	NS	0.1	U	0.11	U	0.052	U
4-Chlorophenyl phenyl ether	mg/Kg	NS	NS	0.046	U	0.049	U	0.060	U
4-Methylphenol	mg/Kg	NS	NS	0.078	U	0.082	U	0.055	U
4-Nitroaniline	mg/Kg	NS	NS	0.12	U	0.13	U	0.076	U
4-Nitrophenol	mg/Kg	NS	NS	0.25	U	0.27	U	0.97	U
Acenaphthene	mg/Kg	500	98	0.058	U	0.061	U	1.4	J
Acenaphthylene	mg/Kg	500	365	0.27	J	0.049	U	5.1	
Acetophenone	mg/Kg	NS	NS	0.061	U	0.064	U	0.044	U
Anthracene	mg/Kg	500	1000	0.06	J	0.051	U	5.9	
Atrazine	mg/Kg	NS	NS	0.061	U	0.064	U	0.090	U
Benzaldehyde	mg/Kg	NS	NS	0.047	U	0.049	U	0.15	U
Benzo[a]anthracene	mg/Kg	37	1	**1.5**		0.0029	U	***13***	
Benzo[a]pyrene	mg/Kg	3.7	22	1.4		0.0029	U	**11**	
Benzo[b]fluoranthene	mg/Kg	37	2.1	1.4		0.0026	U	**10**	
Benzo[g,h,i]perylene	mg/Kg	47	1000	0.85		0.031	U	3.2	
Benzo[k]fluoranthene	mg/Kg	47	2	0.38		0.0032	U	**4.3**	
bis (2-chloroisopropyl) ether	mg/Kg	NS	NS	0.044	U	0.046	U	NA	
Bis(2-chloroethoxy)methane	mg/Kg	NS	NS	0.051	U	0.054	U	0.063	U
Bis(2-chloroethyl)ether	mg/Kg	NS	NS	0.0054	U	0.0057	U	0.048	U
Bis(2-ethylhexyl) phthalate	mg/Kg	NS	NS	0.13	U	0.14	U	0.079	U *
Butyl benzyl phthalate	mg/Kg	NS	NS	0.036	U	0.038	U	0.062	U *
Caprolactam	mg/Kg	NS	NS	0.091	U	0.096	U	0.15	U
Carbazole	mg/Kg	NS	NS	0.047	U	0.049	U	0.050	U
Chrysene	mg/Kg	47	1	**1.7**		0.049	U	**14**	
Dibenz(a,h)anthracene	mg/Kg	3.7	1000	0.24		0.0052	U	1.2	
Dibenzofuran	mg/Kg	180	110	0.046	U	0.049	U	0.49	J
Diethyl phthalate	mg/Kg	NS	NS	0.047	U	0.05	U	0.057	U
Dimethyl phthalate	mg/Kg	NS	NS	0.047	U	0.049	U	0.059	U
Di-n-butyl phthalate	mg/Kg	NS	NS	0.049	U	0.051	U	0.060	U
Di-n-octyl phthalate	mg/Kg	NS	NS	0.025	U	0.027	U	0.10	U *
Diphenyl	mg/Kg	NS	NS	0.053	U	0.056	U	0.30	J
Fluoranthene	mg/Kg	500	1000	1.1		0.055	U	21	
Fluorene	mg/Kg	500	386	0.051	U	0.053	U	6.0	
Hexachlorobenzene	mg/Kg	1.8	3.2	0.0054	U	0.0057	U	0.082	U
Hexachlorobutadiene	mg/Kg	NS	NS	0.0097	U	0.01	U	0.057	U
Hexachlorocyclopentadiene	mg/Kg	NS	NS	0.047	U	0.049	U	0.13	U
Hexachloroethane	mg/Kg	NS	NS	0.0044	U	0.0046	U	0.074	U
Indeno[1,2,3-cd]pyrene	mg/Kg	37	6.6	0.78		0.0077	U	3.4	
Isophorone	mg/Kg	NS	NS	0.048	U	0.05	U	0.043	U
Naphthalene	mg/Kg	500	12	0.046	U	0.048	U	1.1	J
Nitrobenzene	mg/Kg	NS	NS	0.0056	U	0.0059	U	0.063	U
N-Nitrosodi-n-propylamine	mg/Kg	NS	NS	0.0066	U	0.0069	U	0.068	U
N-Nitrosodiphenylamine	mg/Kg	NS	NS	0.039	U	0.041	U	0.18	U
Pentachlorophenol	mg/Kg	6.9	0.80	0.12	U	0.12	U	0.24	U
Phenanthrene	mg/Kg	47	1000	0.05	U	0.059	J	21	
Phenol	mg/Kg	500	0.33	0.053	U	0.056	U	0.066	U
Pyrene	mg/Kg	500	1000	3.4		0.035	U	26	
Total Confident Conc.	mg/Kg			13.08		0.059		148.88	
Total Estimated Conc. (TICs)	mg/Kg			10.69		0		103.2	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
J = Concentration is an approximate value.

B = Compound found in the blank and sample
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019
NS = No Standard

Bold = Concentration exceeds Protection of Groundwater Soil Cleanup Objectives
Bold = Concentration exceeds Commercial Soil Cleanup Objectives
Bold = Concentration exceeds both Protection of Groundwater and Commercial Soil Cleanup Objectives

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives															
		Commercial SCOs	Protection of Groundwater														
Sample ID				MW-101(5.0'-6.0')		MW-101(27.6'-28.6')		MW-102(6.6'-7.2')		MW-102(22.0'-23.0')		MW-103 (5.2'-6.2')		MW-103 (25'-26')		MW-104(6.3'-6.9')	
Lab Sample No.				460-00040154-005		460-00040154-006		460-00040154-003		460-00040154-004		460-00040261-001		460-00040261-002		460-00040154-001	
Sampling Date				5/10/2012		5/10/2012		5/9/2012		5/9/2012		5/11/2012		5/11/2012		5/8/2012	
Matrix				Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor																	
Units				mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
METALS				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	mg/Kg	NS	NS	1200		374		455		208		1940		577		4730	
Antimony	mg/kg	NS	NS	1.3	U	1.5	U	1.2	U	1.4	U	1.2	U	1.4	U	3.2	
Arsenic	mg/kg	16	16	1.1		1.1	U	1.8		1.1	U	1.7		1	U	5.6	
Barium	mg/kg	410	820	12.6	J	1.8	J	1.9	J	3.3	J	59.9		2.6	J	168	
Beryllium	mg/kg	670	47	0.15	U	0.17	U	0.14	U	0.16	U	0.69		0.16	U	1.7	
Cadmium	mg/kg	3.7	7.5	0.16	U	0.17	U	0.15	U	0.17	U	0.14	U	0.16	U	0.23	J
Calcium	mg/kg	NS	NS	12400		354	J	6790		31000		19400		694	J	19500	
Chromium	mg/kg	1,700	NS	3.3		2.3	J	5.5		0.96	U	24.1		2.9		75	
Cobalt	mg/kg	NS	NS	1	J	1	U	0.85	U	0.95	U	21.5		0.93	U	59	
Copper	mg/kg	280	1,720	8.4		2.3	U	5		2.2	U	247		2.1	U	**783**	
Iron	mg/kg	NS	NS	2930		892		5840		491		12600		1230		34500	
Lead	mg/kg	1,000	450	16.9		1.4		1.5		0.96	U	211		1.7		**611**	
Magnesium	mg/kg	NS	NS	1550		192	J	128	J	129	J	2530		305	J	2870	
Manganese	mg/kg	10,000	2,000	37.9		12.3		6.9		5.7		121		16.1		396	
Mercury	mg/kg	1.1	0.73	0.023	U	0.025	U	0.024	U	0.025	U	0.072		0.026	U	0.091	
Nickel	mg/kg	320	130	3.9	J	1	U	1	J	0.98	U	36.5		0.96	U	113	
Potassium	mg/kg	NS	NS	175	J	126	U	106	U	120	U	238	J	166	J	592	J
Selenium	mg/kg	1,700	4	1.4	U	1.6	U	1.3	U	1.5	U	1.3	U	1.4	U	1.6	U
Silver	mg/kg	1,700	8.3	0.21	U	0.24	U	0.2	U	0.22	U	0.19	U	0.22	U	0.29	J
Sodium	mg/kg	NS	NS	183	J	187	U	157	U	341	J	286	J	172	U	447	J
Thallium	mg/kg	NS	NS	1.2	U	1.3	U	1.1	U	1.3	U	1.1	U	1.2	U	1.3	U
Vanadium	mg/kg	NS	NS	6.5	J	2	J	5.9	J	1.2	J	7.6	J	2.6	J	12.5	
Zinc	mg/kg	10,000	2,480	30.9		2.2	J	7.5		1.4	J	2640		4.5	J	7930	
TOTAL METALS	mg/kg			18561		1834		13250		32181		40366		3004		72798	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
Soil Cleanup Objectives from 6 NYCCR Table 375-6.8(b).
J = Concentration is an approximate value.
B = Compound found in the blank and sample
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019

Bold = Concentration exceeds Protection of Groundwater Soil Cleanup Objectives
Bold = Concentration exceeds Commercial Soil Cleanup Objectives
Bold = Concentration exceeds both Protection of Groundwater and Commercial Soil Cleanup Objectives
NS = No Standard

Table 4a
Summary of Soil Analytical Results: VOCs. SVOCs, and Metals
Belle Harbor Shopping Center, Belle Harbor, New York

	units[1]	NYSDEC Soil Cleanup Objectives															
		Commercial SCOs	Protection of Groundwater														
Sample ID				MW-104(37'-38')		MW-105(5.0'-5.8')		MW-105(21'-22')		MW-106(6.0'-7.0')		MW-106(16.0'-17.0')		MW-107(6.0'-6.9')		MW-107(25.0'-26.0')	
Lab Sample No.				460-00040154-002		460-00040154-011		460-00040154-012		460-00040154-009		460-00040154-010		460-00040154-007		460-00040154-008	
Sampling Date				5/8/2012		5/11/2012		5/11/2012		5/11/2012		5/11/2012		5/10/2012		5/10/2012	
Matrix				Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor																	
Units				mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
METALS				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	mg/Kg	NS	NS	177		2500		630		78.2		669		437		466	
Antimony	mg/kg	NS	NS	1.4	U	1.2	U	1.4	U	1.2	U	1.4	U	1.5	U	1.4	U
Arsenic	mg/kg	16	16	1.1	U	3.3		1	U	0.94	U	1.1	U	1.8		1.1	U
Barium	mg/kg	410	820	1.3	U	62.6		2.8	J	4.9	J	2.8	J	3.1	J	1.9	J
Beryllium	mg/kg	670	47	0.17	U	3.3		0.16	U	0.14	U	0.17	U	0.17	U	0.17	U
Cadmium	mg/kg	3.7	7.5	0.17	U	0.18	J	0.16	U	0.15	U	0.17	U	0.17	U	0.17	U
Calcium	mg/kg	NS	NS	777	J	16400		1050	J	1340		882	J	2480		511	J
Chromium	mg/kg	1,700	NS	0.99	U	16.7		2.7		1.5	J	3		6.8		2.4	
Cobalt	mg/kg	NS	NS	0.98	U	12.9		0.93	U	0.85	U	0.99	U	1	U	0.99	U
Copper	mg/kg	280	1,720	2.2	U	187		2.1	U	1.9	U	2.3	U	7		2.3	U
Iron	mg/kg	NS	NS	448		10300		1340		3110		1500		10200		1020	
Lead	mg/kg	1,000	450	0.99	U	203		1.3		12		1.7		8.9		1	U
Magnesium	mg/kg	NS	NS	82.8	U	3940		354	J	71.9	U	344	J	172	J	235	J
Manganese	mg/kg	10,000	2,000	4.3		145		15.4		3.8		16.9		9.1		12.1	
Mercury	mg/kg	1.1	0.73	0.025	U	0.023	U	0.025	U	0.033		0.027	U	0.024	U	0.028	U
Nickel	mg/kg	320	130	1	U	32.2		0.96	U	0.88	U	1	U	1.1	J	1	U
Potassium	mg/kg	NS	NS	123	U	285	J	194	J	143	J	182	J	126	U	132	J
Selenium	mg/kg	1,700	4	1.5	U	1.3	U	1.4	U	1.3	U	1.5	U	1.6	U	1.5	U
Silver	mg/kg	1,700	8.3	0.23	U	0.19	U	0.22	U	0.2	U	0.23	U	0.24	U	0.23	U
Sodium	mg/kg	NS	NS	182	U	312	J	173	U	158	U	184	U	186	U	184	U
Thallium	mg/kg	NS	NS	1.3	U	1.1	U	1.2	U	1.1	U	1.3	U	1.3	U	1.3	U
Vanadium	mg/kg	NS	NS	0.88	U	14.7		2.6	J	2.7	J	2.8	J	6.5	J	2.1	J
Zinc	mg/kg	10,000	2,480	1.2	U	1930		3.6	J	1.2	J	3.8	J	8.8		2.8	J
TOTAL METALS	mg/kg			1406		36348		3594		4697		3608		13342		2385	

Notes:
[1] mg/Kg = miligrams per kilogram = parts per million (ppm)
Soil Cleanup Objectives from 6 NYCCR Table 375-6.8(b).
J = Concentration is an approximate value.
B = Compound found in the blank and sample
U = Analyzed for but not detected

NYSDEC SCOs from 6 NYCCR Part 375 Table 375-6.8(b), amended 2019

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Bold = Concentration exceeds Commercial Soil Cleanup Objectives
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NS = No Standard

Table 5
Groundwater Sampling Summary
Belle Harbor Shopping Center, Belle Harbor, New York

Well No	Well Type	Date of Installation	Total Depth (ft bls)	Well Diameter (in)	Depth to Screened Interval Bot (ft bls)		Top (ft bls)	Analyses Conducted	DV/DUSR
MW-1	WT	3/12/2003	17	2	17	-	2	V, S	Yes
MW-2	WT	3/12/2003	17	2	17	-	2	V, S, 1,4-D, PFAS	Yes
MW-2D	DOB	5/25/2004	40	2	40	-	35	V, S	Yes
MW-3	WT	3/13/2003	17	2	16	-	2	V, S, 1,4-D, PFAS	Yes
MW-4	WT	3/13/2003	16	2	16	-	2	V, S, 1,4-D, PFAS	Yes
MW-4D	DOB	5/25/2004	40	2	40	-	35	V, S	Yes
MW-5	WT	3/14/2003	16	2	16	-	2	V, S	Yes
MW-6	WT	3/14/2003	16	2	16	-	2	V, S	Yes
MW-7	WT	5/24/2004	18	2	18	-	3	V, S	Yes
MW-8S	WT	5/24/2004	17	2	17	-	2	V, S	Yes
MW-8D	DOB	5/24/2004	40	2	40	-	35	V, S	Yes
SVP-6	TW	3/19/2012	11	1	11	-	8	V, S	Yes
SVP-9	TW	3/8/2012	11	1	11	-	8	V, S	Yes
SVP-11	TW	3/19/2012	11	1	11	-	8	V, S	Yes
MW-101S	WT	5/10/2012	10	2	10	-	5	V, S	Yes
MW-101D	MLOB	5/10/2012	30	2	28	-	23	V, S	Yes
MW-102S	WT	5/9/2012	12	2	10	-	5	V, S	Yes
MW-102D	MLOB	5/9/2012	24	2	22	-	17	V, S	Yes
MW-103	MLOB	5/11/2012	28	2	26	-	21	V, S	Yes
MW-104S	WT	5/8/2012	14	2	12	-	7	V, S	Yes
MW-104A -S	MLOB	5/9/2012	24	2	22	-	17	V, S	Yes
MW-104D	DOB	6/20/2012	40	2	38	-	33	V, S	Yes
MW-105S	MLOB	5/11/2012	24	2	22	-	12	V, S	Yes
MW-106S	MLOB	5/11/2012	20	2	18	-	8	V, S	Yes
MW-107	MLOB	5/10/2012	28	2	25	-	20	V, S	Yes
MW-108S	WT	10/24/2012	20	2	20	-	5	V, S, M, CN	Yes
MW-109S	WT	10/24/2012	15	2	15	-	5	V, S, M, CN	Yes
MW-110S	WT	10/24/2012	20	2	20	-	5	V, S, M, CN	Yes

Notes:

TW = Temporary Well
WT = Water Table
MLOB = Mid-Level Overburden
DOB = Deep Overburden
ft bls = feet below land surface

V = Volatile organic compounds by Method 8260
S = Semi-volatile organic compounds by Method 8270
M = Metals by Methods 6010/7471A/9010B
CN = Cyanide (total and free)
1,4-D = 1,4-Dioxane
PFAS = Per- and Polyfluoroalkyl Substances
DV/DUSR = Data Validation / Data Usability Summary Report

MW-1 through MW-8D installed by Whitestone Associates, Inc. See Appendix A
SVP-6 TO SVP-11 AND MW-101S through MW-107 installed by Stantec Consulting Services. See Tables 5a to 5g
MW-108S through MW-110S installed by GEI Consultants, Inc. See Appendix B

TABLE 5a
Summary of Groundwater Quality Results - Interior: VOCs and SVOCs 2012
Belle Harbor Shopping Center, Belle Harbor, New York

		Sample Location	Citi Bank		Ciros Pizza		Vacant Unit/ Liquor Warehouse		Trip Blank	
		Medium	Groundwater		Groundwater		Groundwater		Blank	
		Laboratory ID	460-38105-3		460-38105-2		460-37719-1		460-38105-1	
		Sample ID	SVP-6		SVP-11		SV-9		Trip	
		Sample Date	03/19/12		03/19/12		3/8/2012		03/19/12	
		Dilution Factor	1		1		5		1	
VOLATILE COMPOUNDS (GC/MS)	**Units**	**AWQSGVs**								
1,1,1-Trichloroethane	ug/l	5	0.060	U	0.060	U	0.3	U	0.060	U
1,1,2,2-Tetrachloroethane	ug/l	5	0.16	U	0.16	U	0.8	U	0.16	U
1,1,2-Trichloroethane	ug/l	1	0.19	U	0.19	U	0.95	U	0.19	U
1,1-Dichloroethane	ug/l	5	0.13	U	0.13	U	0.65	U	0.13	U
1,1-Dichloroethene	ug/l	5	0.09	U	0.09	U	0.45	U	0.09	U
1,2,3-Trichlorobenzene	ug/l	NS	NR		NR		2.6	U	NR	
1,2,4-Trichlorobenzene	ug/l	NS	0.34	U	0.34	U	1.7	U	0.34	U
1,2-Dibromo-3-Chloropropane	ug/l	0.04	0.4	U	0.4	U	2	U	0.4	U
1,2-Dibromoethane	ug/l	NS	0.28	U	0.28	U	1.4	U	0.28	U
1,2-Dichlorobenzene	ug/l	NS	NR		NR		1.1	U	NR	
1,2-Dichloroethane	ug/l	0.6	0.19	U	0.19	U	0.95	U	0.19	U
1,2-Dichloropropane	ug/l	1	0.090	U	0.090	U	0.45	U	0.090	U
1,3-Dichlorobenzene	ug/l	NS	0.14	U	0.14	U	0.7	U	0.14	U
1,4-Dichlorobenzene	ug/l	3	0.23	U	0.23	U	1.2	U	0.23	U
1,4-Dioxane	ug/l	NS	NR		NR		180	U	NR	
2-Butanone (MEK)	ug/l	NS	2.3	U	2.3	U	12	U	2.3	U
2-Hexanone	ug/l	NS or 50*	0.5	U	0.5	U	2.5	U	0.5	U
4-Methyl-2-pentanone	ug/l	NS	0.99	U	0.99	U	5	U	0.99	U
Acetone	ug/l	50*	2.7	U	16		13	U	2.7	U
Benzene	ug/l	1	0.73	J	0.52	J	0.75	J	0.080	U
Bromochloromethane	ug/l	NS	NR		NR		1.4		NR	
Bromodichloromethane	ug/l	NS	0.12	U	0.12	U	0.6	U	0.12	U
Bromoform	ug/l	NS	0.19	U	0.19	U	0.95	U	0.19	U
Bromomethane	ug/l	5	0.18	U	0.18	U	0.9	U	0.18	U
Carbon disulfide	ug/l	60	3.0		2.0		2.7	J	0.13	U
Carbon tetrachloride	ug/l	5	0.060	U	0.060	U	0.3	U	0.060	U
Chlorobenzene	ug/l	5	0.11	U	0.11	U	0.55	U	0.11	U
Chloroethane	ug/l	5	0.17	U	0.17	U	0.85	U	0.17	U
Chloroform	ug/l	7	0.08	U	0.08	U	0.4	U	0.08	U
Chloromethane	ug/l	NS	0.10	U	0.1	U	0.5	U	0.1	U
cis-1,2-Dichloroethene	ug/l	5	3.6		1.7		**7.1**		0.18	U
cis-1,3-Dichloropropene	ug/l	NS	0.18	U	0.18	U	0.9	U	0.18	U
Cyclohexane	ug/l	NS	0.16	U	0.16	U	0.8	U	0.16	U
Dibromochloromethane	ug/l	NS or 50*	0.2	U	0.2	U	1.0	U	0.2	U
Dichlorodifluoromethane	ug/l	5	0.22	U	0.22	U	1.1	U	0.22	U
Ethylbenzene	ug/l	5	**12**		3.8		**320**		0.10	U
Freon TF	ug/l	NS	0.08	U	0.08	U	0.4	U	0.08	U
Isopropylbenzene	ug/l	5	NR		NR		**46**		NR	
m&p-Xylene	ug/l	NS	NR		NR		67		NR	

TABLE 5a
Summary of Groundwater Quality Results - Interior: VOCs and SVOCs 2012
Belle Harbor Shopping Center, Belle Harbor, New York

		Sample Location	**Citi Bank**		**Ciros Pizza**		**Vacant Unit/ Liquor Warehouse**		**Trip Blank**	
		Medium	Groundwater		Groundwater		Groundwater		Blank	
		Laboratory ID	460-38105-3		460-38105-2		460-37719-1		460-38105-1	
		Sample ID	SVP-6		SVP-11		SV-9		Trip	
		Sample Date	03/19/12		03/19/12		3/8/2012		03/19/12	
		Dilution Factor	1		1		5		1	
VOLATILE COMPOUNDS (GC/MS)	**Units**	**AWQSGVs**								
Methyl acetate	ug/l	NS	0.34	U	0.34	U	1.7	U	0.34	U
Methylcyclohexane	ug/l	NS	0.14	U	0.14	U	0.7	U	0.14	U
Methylene Chloride	ug/l	5	0.39	J	0.64	J	0.9	U	0.18	U
Methyl t-butyl ether (MTBE)	ug/l	NS	0.14	U	0.14	U	0.7	U	0.14	U
o-Xylene	ug/l	5	NR		NR		**170**		NR	
Styrene	ug/l	5	0.38	J	0.25	J	0.6	U	0.12	U
Tetrachloroethene (PCE)	ug/l	5	2.7		**6.1**		1.2	J	0.10	U
Toluene	ug/l	5	0.47	J	0.43	J	**41**		0.15	U
trans-1,2-Dichloroethene	ug/l	5	2.1		1.6		2.8	J	0.13	U
trans-1,3-Dichloropropene	ug/l	0.4	0.24	U	0.24	U	1.2	U	0.24	U
Trichloroethene (TCE)	ug/l	5	2.0		4.7		0.45	U	0.090	U
Trichlorofluoromethane	ug/l	5	0.15	U	0.15	U	0.75	U	0.15	U
Vinyl chloride	ug/l	2	**2.2**		0.64	J	1.7	J	0.14	U
Xylenes, Total	ug/l	NS	0.90	J	0.36	U	237		0.36	U
Total Confident Conc.		5	30.5		38.4		660.25		0.00	

Notes:
AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard
NR = Not Reported
U = Analyzed for but not detected
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

TABLE 5a
Summary of Groundwater Quality Results - Interior: VOCs and SVOCs 2012
Belle Harbor Shopping Center, Belle Harbor, New York

		Sample Location	**Citi Bank**		**Ciros Pizza**		**Vacant Unit/ Liquor Warehouse**	
		Medium	Groundwater		Groundwater		Groundwater	
		Laboratory ID	460-38105-3		460-38105-2		460-37719-1	
		Sample ID	SVP-6		SVP-11		SV-9	
		Sample Date	03/19/12		03/19/12		3/8/2012	
		Dilution Factor	1		1		10	
SVOCs-8270C-WATER	**Units**	**AWQSGVs**						
2,4,5-Trichlorophenol	ug/l	NS	2.6	U	2.6	U	26	U
2,4,6-Trichlorophenol	ug/l	NS	2.4	U	2.4	U	24	U
2,4-Dichlorophenol	ug/l	1	2.6	U	2.6	U	26	U
2,4-Dimethylphenol	ug/l	1	3.4	U	3.4	U	34	U
2,4-Dinitrophenol	ug/l	1	5.5	U	5.5	U	54	U
2,4-Dinitrotoluene	ug/l	5	0.47	U	0.47	U	4.7	U
2,6-Dinitrotoluene	ug/l	5	0.62	U	0.62	U	6.1	U
2-Chloronaphthalene	ug/l	NS or 10*	2.7	U	2.7	U	27	U
2-Chlorophenol	ug/l	NS	2.2	U	2.2	U	22	U
2-Methylnaphthalene	ug/l	NS	3.0	U	3.0	U	96	J D
2-Methylphenol	ug/l	NS	1.8	U	1.8	U	18	U
2-Nitroaniline	ug/l	5	4.9	U	4.9	U	49	U
2-Nitrophenol	ug/l	NS	2.4	U	2.4	U	24	U
3,3'-Dichlorobenzidine	ug/l	5	4.9	U	4.9	U	49	U
3-Nitroaniline	ug/l	5	5.1	U	5.1	U	50	U
4,6-Dinitro-2-methylphenol	ug/l	NS	4.7	U	4.7	U	47	U
4-Bromophenyl phenyl ether	ug/l	NS	2.5	U	2.5	U	25	U
4-Chloro-3-methylphenol	ug/l	NS	2.5	U	2.5	U	25	U
4-Chloroaniline	ug/l	5	2.0	U	2.0	U	20	U
4-Chlorophenyl phenyl ether	ug/l	NS	2.5	U	2.5	U	25	U
4-Methylphenol	ug/l	NS	1.6	U	1.6	U	16	U
4-Nitroaniline	ug/l	5	5.9	U	5.9	U	58	U
4-Nitrophenol	ug/l	NS	6.8	U	6.8	U	67	U
Acenaphthene	ug/l	20	**67**		**110**		**300**	D
Acenaphthylene	ug/l	NS	2.7	U	2.7	J	34	J D
Acetophenone	ug/l	NS	NR		NR		27	U
Anthracene	ug/l	NS or 50*	2.8	U	3.9	J	**84**	J D
Atrazine	ug/l	7.5	NR		NR		30	U
Benzaldehyde	ug/l	NS	NR		NR		20	U *
Benzo[a]anthracene	ug/l	NS or 0.002*	0.27	U	**0.96**	J	**44**	D
Benzo[a]pyrene	ug/l	ND	0.14	U	0.54	J	27	D

TABLE 5a
Summary of Groundwater Quality Results - Interior: VOCs and SVOCs 2012
Belle Harbor Shopping Center, Belle Harbor, New York

		Sample Location	Citi Bank		Ciros Pizza		Vacant Unit/ Liquor Warehouse	
		Medium	Groundwater		Groundwater		Groundwater	
		Laboratory ID	460-38105-3		460-38105-2		460-37719-1	
		Sample ID	SVP-6		SVP-11		SV-9	
		Sample Date	03/19/12		03/19/12		3/8/2012	
		Dilution Factor	1		1		10	
SVOCs-8270C-WATER	**Units**	**AWQSGVs**						
Benzo[b]fluoranthene	ug/l	NS or 0.002*	**0.26**	J	**0.65**	J	**20**	D
Benzo[g,h,i]perylene	ug/l	NS	2.0	U	2.0	U	20	U
Benzo[k]fluoranthene	ug/l	NS or 0.002*	0.26	U	0.26	U	**8.2**	J D
bis (2-chloroisopropyl) ether	ug/l	NS	2.0	U	2.0	U	26	U
Bis(2-chloroethoxy)methane	ug/l	5	2.6	U	2.6	U	26	U
Bis(2-chloroethyl)ether	ug/l	1	0.28	U	0.28	U	2.8	U
Bis(2-ethylhexyl) phthalate	ug/l	5	2.0	U	2.66	J	20	U
Butyl benzyl phthalate	ug/l	NS or 50*	2.5	U	2.5	U	25	U
Caprolactam	ug/l	NS	NR		NR		25	U
Carbazole	ug/l	NS	3.2	U	4.6	J	32	U
Chrysene	ug/l	NS or 0.002*	3.1	U	3.1	U	**52**	J D
Dibenz(a,h)anthracene	ug/l	NS	0.091	J	0.091	J	0.90	U
Dibenzofuran	ug/l	NS	2.8	U	8.7	J	28	U
Diethyl phthalate	ug/l	NS or 50*	2.9	U	2.9	U	29	U
Dimethyl phthalate	ug/l	NS or 50*	2.8	U	2.8	U	28	U
Di-n-butyl phthalate	ug/l	50	2.9	U	2.9	U	29	U
Di-n-octyl phthalate	ug/l	NS or 50*	1.5	U	1.5	U	15	U
Diphenyl	ug/l	5	NR		NR		**86**	J D
Fluoranthene	ug/l	NS or 50*	3.2	U	3.2	U	**87**	J D
Fluorene	ug/l	NS or 50*	2.8	U	16		**160**	D
Hexachlorobenzene	ug/l	0.4	0.29	U	0.29	U	2.9	U
Hexachlorobutadiene	ug/l	0.5	0.58	U	0.58	U	5.7	U
Hexachlorocyclopentadiene	ug/l	0.45	1.7	U	1.7	U	17	U
Hexachloroethane	ug/l	5	0.25	U	0.25	U	2.5	U
Indeno[1,2,3-cd]pyrene	ug/l	NS or 0.002*	**0.15**	J	**0.15**	J	**7.7**	J D
Isophorone	ug/l	NS or 50*	2.7	U	2.7	U	27	U
Naphthalene	ug/l	NS or 10*	2.7	U	2.7	U	**2100**	D
Nitrobenzene	ug/l	0.4	0.30	U	0.30	U	3.0	U
N-Nitrosodi-n-propylamine	ug/l	NS	0.25	U	0.25	U	2.5	U
N-Nitrosodiphenylamine	ug/l	NS or 50*	2.9	U	2.9	U	29	U
Pentachlorophenol	ug/l	1	2.9	U	2.9	U	53	U

TABLE 5a
Summary of Groundwater Quality Results - Interior: VOCs and SVOCs 2012
Belle Harbor Shopping Center, Belle Harbor, New York

		Sample Location	**Citi Bank**		**Ciros Pizza**		**Vacant Unit/ Liquor Warehouse**	
		Medium	Groundwater		Groundwater		Groundwater	
		Laboratory ID	460-38105-3		460-38105-2		460-37719-1	
		Sample ID	SVP-6		SVP-11		SV-9	
		Sample Date	03/19/12		03/19/12		3/8/2012	
		Dilution Factor	1		1		10	
SVOCs-8270C-WATER	**Units**	**AWQSGVs**						
Phenanthrene	ug/l	NS or 50*	3.1	U	13		**<u>330</u>**	D
Phenol	ug/l	1	0.82	U	0.82	U	**8.1**	U
Pyrene	ug/l	NS or 50*	2.9	U	2.9	U	**<u>160</u>**	D
Total Confident Conc.	ug/l	NS	67.5		164.0		3596	

Notes:

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards

* = Guidance Value

SVOCs = semi-volatile organic compounds

ug/L = micrograms per liter

NS = No Standard

NR = Not Reported

U = Analyzed for but not detected

D = Sample results are obtained from a dilution

J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.

Bold = Concentration exceeds Groundwater Quality Standards (shaded)

<u>Bold =</u> Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-2		MW-2		MW-2		MW-2D		MW-2D		MW-2D		MW-3		MW-3		MW-3		MW-4		MW-4S		MW-4S	
		Lab Sample ID	460-41884-7				460-215426-2		460-41884-6				460-215490-5		460-41785-6				460-215426-1		460-41879-3		460-149439-1		460-215490-2	
		Sampling Date	6/28/2012		1/31/2018		8/6/2020		6/28/2012		1/31/2018		8/5/2020		6/26/2012		1/31/2018		8/6/2020		6/29/2012		1/31/2018		8/5/2020	
		Matrix	Water				Water		Water				Water		Water				Water		Water		Water		Water	
		Dilution Factor	1				1		1				1		1				1		1		1		1	
VOA-8260B-WATER	**Units**	**AWQSGVs**	Result	Q			Result	Q	Result	Q			Result	Q	Result	Q			Result	Q	Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	ug/l	5	0.06	U	Not Sampled		0.24	U	0.06	U	Not Sampled		0.24	U	0.06	U	Not Sampled		0.24	U	0.06	U	0.28	U	0.24	U
1,1,2,2-Tetrachloroethane	ug/l	5	0.16	U			0.37	U	0.16	U			0.37	U	0.16	U			0.37	U	0.16	U	0.19	U	0.37	U
1,1,2-Trichloroethane	ug/l	1	0.19	U			0.43	U	0.19	U			0.43	U	0.19	U			0.43	U	0.19	U	0.08	U	0.43	U
1,1-Dichloroethane	ug/l	5	0.13	U			0.26	U	0.13	U			0.26	U	0.13	U			0.26	U	0.13	U	0.24	U	0.26	U
1,1-Dichloroethene	ug/l	5	0.09	U			0.26	U	0.09	U			0.26	U	0.09	U			0.26	U	0.33	J	0.34	U	0.26	U
1,2,4-Trichlorobenzene	ug/l	NS	0.34	U			0.37	U	0.34	U			0.37	U	0.34	U			0.37	U	0.34	U	0.27	U	0.37	U
1,2-Dibromo-3-Chloropropane	ug/l	0.04	0.4	U			0.38	U	0.4	U			0.38	U	0.4	U			0.38	U	0.4	U	0.23	U	0.38	U
1,2-Dibromoethane	ug/l	NS	0.28	U			0.28	U	0.28	U			0.28	U	0.28	U			0.28	U	0.28	U	0.23	U	0.28	U
1,2-Dichlorobenzene	ug/l	NS	0.21	U			0.43	U	0.21	U			0.43	U	0.21	U			0.43	U	0.21	U	0.22	U	0.43	U
1,2-Dichloroethane	ug/l	0.6	0.19	U			0.43	U	0.19	U			0.43	U	0.19	U			0.43	U	0.19	U	0.25	U	0.43	U
1,2-Dichloropropane	ug/l	1	0.09	U			0.35	U	0.09	U			0.35	U	0.09	U			0.35	U	0.09	U	0.18	U	0.35	U
1,3-Dichlorobenzene	ug/l	NS	0.14	U			0.34	U	0.14	U			0.34	U	0.14	U			0.34	U	0.14	U	0.33	U	0.34	U
1,4-Dichlorobenzene	ug/l	3	0.23	U			0.33	U	0.23	U			0.33	U	0.23	U			0.33	U	0.23	U	0.33	U	0.33	U
2-Butanone	ug/l	NS	2.3	U			1.9	U	2.3	U			1.9	U	2.3	U			1.9	U	2.3	U	2.2	U	1.9	U
2-Hexanone	ug/l	NS or 50*	0.5	U			1.1	U	0.5	U			1.1	U	0.5	U			1.1	U	0.5	U	0.72	U	1.1	U
4-Methyl-2-pentanone (MIBK)	ug/l	NS	0.99	U			1.3	U	0.99	U			1.3	U	0.99	U			1.3	U	0.99	U	0.63	U	1.3	U
Acetone	ug/l	50*	2.7	U			4.4	U	2.7	U			4.4	U	2.7	U			4.4	U	2.7	U	1.6	J	4.4	U
Benzene	ug/l	1	0.08	U			**3.2**		0.08	U			0.2	U	0.08	U			0.2	U	0.099	J	0.09	U	0.2	U
Bromodichloromethane	ug/l	NS	0.12	U			0.12	U	0.12	U			0.12	U	0.12	U			0.12	U	0.12	U	0.12	U	0.12	U
Bromoform	ug/l	NS	0.19	U			0.54	U	0.19	U			0.54	U	0.19	U			0.54	U	0.19	U	0.18	U	0.54	U
Bromomethane	ug/l	5	0.18	U			0.55	U	0.18	U			0.55	U	0.18	U			0.55	U	0.18	U	0.18	U	0.55	U
Carbon disulfide	ug/l	60	0.13	U			0.82	U	0.13	U			0.82	U	0.13	U			1.2		0.13	U	0.22	U	0.82	U
Carbon tetrachloride	ug/l	5	0.06	U			0.21	U	0.06	U			0.21	U	0.06	U			0.21	U	0.06	U	0.33	U	0.21	U
Chlorobenzene	ug/l	5	0.11	U			0.38	U	0.11	U			0.38	U	0.11	U			0.38	U	0.11	U	0.24	U	0.38	U
Chloroethane	ug/l	5	0.17	U			0.32	U	0.17	U			0.32	U	0.17	U			0.32	U	0.17	U	0.37	U	0.32	U
Chloroform	ug/l	7	0.08	U			0.33	U	0.08	U			0.33	U	0.08	U			0.33	U	0.4	J	0.22	U	0.33	U
Chloromethane	ug/l	NS	0.1	U			0.4	U	0.1	U			0.4	U	0.1	U			0.4	U	0.1	U	0.22	U	0.4	U
cis-1,2-Dichloroethene	ug/l	5	2.5				0.8	J	0.18	U			0.22	U	0.18	U			0.22	U	**220**		**340**		**210**	
cis-1,3-Dichloropropene	ug/l	NS	0.18	U			0.22	U	0.18	U			0.22	U	0.18	U			0.22	U	0.18	U	0.16	U	0.22	U
Cyclohexane	ug/l	NS	0.16	U			0.32	U	0.16	U			0.32	U	0.16	U			0.32	U	0.16	U	0.26	U	0.32	U
Dibromochloromethane	ug/l	NS or 50*	0.2	U			0.34	U	0.2	U			0.34	U	0.2	U			0.34	U	0.2	U	0.15	U	0.34	U
Dichlorodifluoromethane	ug/l	5	0.22	U			0.31	U	0.22	U			0.31	U	0.22	U			0.31	U	0.22	U	0.14	U	0.31	U
Ethylbenzene	ug/l	5	**6.7**				**13**		0.1	U			0.3	U	0.1	U			0.3	U	0.56	J	0.33	J	0.69	J
Freon TF	ug/l	NS	0.08	U			0.5	U	0.08	U			0.5	U	0.08	U			0.5	U	0.08	U	0.19	U	0.5	U
Isopropylbenzene	ug/l	5	4.9				**20**		0.08	U			0.34	U	0.08	U			0.34	U	1		0.71	J	0.61	J
Methyl acetate	ug/l	NS	0.34	U			0.79	U	0.34	U			0.79	U	0.34	U			0.79	U	0.34	U	0.58	U	0.79	U
Methylcyclohexane	ug/l	NS	0.14	U			0.45	J	0.14	U			0.26	U	0.14	U			0.26	U	0.14	U	0.22	U	0.26	U
Methylene Chloride	ug/l	5	0.18	U			0.32	U	0.18	U			0.32	U	0.18	U			0.32	U	0.18	U *	0.48	J	0.32	U
MTBE	ug/l	NS	0.14	U			0.47	U	1.4				2.9		0.14	U			0.47	U	0.14	U	0.13	U	0.47	U
Styrene	ug/l	5	0.12	U			0.42	U	0.12	U			0.42	U	0.12	U			0.42	U	1.2		0.17	U	0.42	U
Tetrachloroethene (PCE)	ug/l	5	0.35	J			0.25	U	0.1	U			0.25	U	1.5				2.1		**310**		**5.1**		**47**	
Toluene	ug/l	5	0.16	J			0.42	J	0.15	U			0.38	U	0.15	U			0.38	U	0.15	U	0.25	U	0.38	U
trans-1,2-Dichloroethene	ug/l	5	1.9				2.9		0.13	U			0.24	U	0.13	U			0.24	U	4.7		**33**		**27**	
trans-1,3-Dichloropropene	ug/l	0.4	0.24	U			0.49	U	0.24	U			0.49	U	0.24	U			0.49	U	0.24	U	0.19	U	0.49	U
Trichloroethene (TCE)	ug/l	5	0.79	J			0.31	U	0.09	U			0.31	U	0.09	U			0.31	U	**200**		**50**		**20**	
Trichlorofluoromethane	ug/l	5	0.15	U			0.32	U	0.15	U			0.32	U	0.15	U			0.32	U	0.15	U	0.15	U	0.32	U
Vinyl chloride	ug/l	2	0.88	J			0.72	J	0.14	U			0.17	U	0.14	U			0.17	U	**47**		**110**		**63**	
Xylenes, Total	ug/l	NS	0.36	U			1.36	J	0.36	U			0.66	U	0.36	U			0.66	U	30		1.38	J	1.1	J
Total Conc	ug/l	NS	18.18				42.85		1.4				2.9		1.5				3.3		815.289		542.6		369.4	
Total TICs	ug/l	NS	119.5						0.0*T						0.0*T						962		14			

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)

NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Series (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

		Client ID	MW-4D		MW-4D		MW-4D		MW-5		MW-5		MW-5		MW-6		MW-6		MW-6		MW-7		MW-7		MW-7	
		Lab Sample ID	460-41879-4		460-149439-2		460-215490-1		460-41884-5		460-149439-3		460-215089-3		460-41785-5						460-41884-2					
		Sampling Date	6/29/2012		1/31/2018		8/5/2020		6/27/2012		1/31/2018		8/3/2020		6/26/2012		1/31/2018		8/3/2020		6/27/2012		1/31/2018		8/3/2020	
		Matrix	Water		Water		Water		Water		Water		Water		Water						Water					
		Dilution Factor	1		1		1		1		1		1		1						1					
VOA-8260B-WATER	**Units**	**AWQSGVs**	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q					Result	Q				
1,1,1-Trichloroethane	ug/l	5	0.06	U	0.28	U	0.24	U	0.06	U	0.28	U	0.24	U	0.06	U	Not Sampled		Not Sampled		0.06	U	Not Sampled		Not Sampled	
1,1,2,2-Tetrachloroethane	ug/l	5	0.16	U	0.19	U	0.37	U	0.16	U	0.19	U	0.37	U	0.16	U					0.16	U				
1,1,2-Trichloroethane	ug/l	1	0.19	U	0.08	U	0.43	U	0.19	U	0.08	U	0.43	U	0.19	U					0.19	U				
1,1-Dichloroethane	ug/l	5	0.13	U	0.24	U	0.26	U	0.13	U	0.24	U	0.26	U	0.13	U			DFM		0.13	U				
1,1-Dichloroethene	ug/l	5	0.09	U	0.34	U	0.26	U	0.09	U	0.34	U	0.26	U	0.09	U					0.09	U				
1,2,4-Trichlorobenzene	ug/l	NS	0.34	U	0.27	U	0.37	U	0.34	U	0.27	U	0.37	U	0.34	U					0.34	U				
1,2-Dibromo-3-Chloropropane	ug/l	0.04	0.4	U	0.23	U	0.38	U	0.4	U	0.23	U	0.38	U	0.4	U					0.4	U				
1,2-Dibromoethane	ug/l	NS	0.28	U	0.23	U	0.28	U	0.28	U	0.23	U	0.28	U	0.28	U					0.28	U				
1,2-Dichlorobenzene	ug/l	NS	0.21	U	0.22	U	0.43	U	0.21	U	0.22	U	0.43	U	0.21	U					0.21	U				
1,2-Dichloroethane	ug/l	0.6	0.19	U	0.25	U	0.43	U	0.19	U	0.25	U	0.43	U	0.19	U					0.19	U				
1,2-Dichloropropane	ug/l	1	0.09	U	0.18	U	0.35	U	0.09	U	0.18	U	0.35	U	0.09	U					0.09	U				
1,3-Dichlorobenzene	ug/l	NS	0.14	U	0.33	U	0.34	U	0.14	U	0.33	U	0.34	U	0.14	U					0.14	U				
1,4-Dichlorobenzene	ug/l	3	0.23	U	0.33	U	0.33	U	0.23	U	0.33	U	0.33	U	0.23	U					0.23	U				
2-Butanone	ug/l	NS	2.3	U	2.2	U	1.90	U	2.3	U	2.20	U	1.90	U	2.3	U					2.3	U				
2-Hexanone	ug/l	NS or 50*	0.5	U	0.72	U	1.10	U	0.5	U	0.72	U	1.10	U	0.5	U					0.5	U				
4-Methyl-2-pentanone (MIBK)	ug/l	NS	0.99	U	0.88	J	1.30	U	0.99	U	0.63	U	1.30	U	0.99	U *					0.99	U				
Acetone	ug/l	50*	2.7	U	1.8	J	4.40	U	2.7	U	1.10	U	4.40	U	2.7	U					2.7	U				
Benzene	ug/l	1	0.08	U	0.09	U	0.20	U	0.18	J	0.12	J	0.20	U	0.76	J					0.08	U				
Bromodichloromethane	ug/l	NS	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U					0.12	U				
Bromoform	ug/l	NS	0.19	U	0.18	U	0.54	U	0.19	U	0.18	U	0.54	U	0.19	U					0.19	U				
Bromomethane	ug/l	5	0.18	U	0.18	U	0.55	U	0.18	U	0.18	U	0.55	U	0.18	U					0.18	U				
Carbon disulfide	ug/l	60	0.13	U	0.22	U	0.82	U	0.13	U	0.22	U	0.82	U	0.13	U					0.13	U				
Carbon tetrachloride	ug/l	5	0.06	U	0.33	U	0.21	U	0.06	U	0.33	U	0.21	U	0.06	U					0.06	U				
Chlorobenzene	ug/l	5	0.11	U	0.24	U	0.38	U	0.11	U	0.24	U	0.38	U	0.11	U					0.11	U				
Chloroethane	ug/l	5	0.17	U	0.37	U	0.32	U	0.17	U	0.37	U	0.32	U	0.17	U					0.17	U				
Chloroform	ug/l	7	0.08	U	0.22	U	0.33	U	0.08	U	0.22	U	0.33	U	0.08	U					0.08	U				
Chloromethane	ug/l	NS	0.1	U	0.22	U	0.40	U	0.1	U	0.22	U	0.40	U	0.1	U					0.1	U				
cis-1,2-Dichloroethene	ug/l	5	0.23	J	0.26	U	0.22	U	0.58	J	1.40		**9.2**		0.18	U					0.18	U				
cis-1,3-Dichloropropene	ug/l	NS	0.18	U	0.16	U	0.22	U	0.18	U	0.16	U	0.22	U	0.18	U					0.18	U				
Cyclohexane	ug/l	NS	0.16	U	0.26	U	0.32	U	0.16	U	0.26	U	0.32	U	0.16	U					0.16	U				
Dibromochloromethane	ug/l	NS or 50*	0.2	U	0.15	U	0.34	U	0.2	U	0.15	U	0.34	U	0.2	U					0.2	U				
Dichlorodifluoromethane	ug/l	5	0.22	U	0.14	U	0.31	U	0.22	U	0.14	U	0.31	U	0.22	U					0.22	U				
Ethylbenzene	ug/l	5	**300**		**95**		**27**		**28**		0.30	U	0.43	J	**180**						0.1	U				
Freon TF	ug/l	NS	0.08	U	0.19	U	0.50	U	0.08	U	0.19	U	0.50	U	0.08	U					0.08	U				
Isopropylbenzene	ug/l	5	**5.4**				**6.5**		3.8		0.32	U	0.71	J	**33**						0.08	U				
Methyl acetate	ug/l	NS	0.34	U	0.58	U	0.79	U	0.34	U	0.58	U	0.79	U	0.34	U					0.34	U				
Methylcyclohexane	ug/l	NS	0.14	U	0.22	U	0.26	U	0.14	U	0.22	U	0.26	U	0.14	U					0.14	U				
Methylene Chloride	ug/l	5	0.18	U *	0.56	J	0.32	U	0.18	U		J	0.32	U	0.18	U					0.18	U				
MTBE	ug/l	NS	0.14	U	0.13	U	0.58	J	0.14	U	0.13	U	0.47	U	0.73	J					0.14	U				
Styrene	ug/l	5	**240**		**13**		1.00		0.12	U	0.17	U	0.42	U	0.12	U					0.12	U				
Tetrachloroethene (PCE)	ug/l	5	1.2		0.12	U	0.25	U	0.78	J	0.23	J	0.28	J	0.1	U					0.1	U				
Toluene	ug/l	5	**9.2**		1.9		0.38	U	2		0.25	U	0.38	U	2						0.15	U				
trans-1,2-Dichloroethene	ug/l	5	0.13	U	0.18	U	0.24	U	2.1		2.90		0.87	J	0.13	U					0.13	U				
trans-1,3-Dichloropropene	ug/l	0.4	0.24	U	0.19	U	0.49	U	0.24	U	0.19	U	0.49	U	0.24	U					0.24	U				
Trichloroethene (TCE)	ug/l	5	0.43	J	0.22	U	0.31	U	0.2	J	0.30	J	3.30		0.09	U					0.09	U				
Trichlorofluoromethane	ug/l	5	0.15	U	0.15	U	0.32	U	0.15	U	0.15	U	0.32	U	0.15	U					0.15	U				
Vinyl chloride	ug/l	2	0.14	U	0.06	U	0.17	U	**3.0**		1.10		**2.7**		0.14	U					0.14	U				
Xylenes, Total	ug/l	NS	440		104		21.5		27		0.60	U	0.82	J	130						0.36	U				
Total Conc	ug/l	NS	996.46		222.14		56.58		67.64		6.71		17.95		346.49						0					
Total TICs	ug/l	NS	4069		1186.7				113.8		0.0*T				1533						0.0*T					

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-8S		MW-8S		MW-8S		MW-8D		MW-8D		MW-8D		MW-101S		MW-101S		MW-101S		MW-101D		MW-101D		MW-101D	
		Lab Sample ID	460-42023-3												460-41785-3						460-41785-2					
		Sampling Date	6/29/2012		1/31/2018		8/3/2020		6/29/2012		1/31/2018		8/3/2020		6/26/2012		1/31/2018		8/3/2020		6/26/2012		1/31/2018		8/3/2020	
		Matrix	Water												Water						Water					
		Dilution Factor	1												1						1					
VOA-8260B-WATER	**Units**	**AWQSGVs**	Result	Q											Result	Q					Result	Q				
1,1,1-Trichloroethane	ug/l	5	0.06	U	Not Sampled		Not Sampled		Not Sampled		Not Sampled		Not Sampled		0.06	U	Not Sampled		Not Sampled		0.06	U	Not Sampled		Not Sampled	
1,1,2,2-Tetrachloroethane	ug/l	5	0.16	U											0.16	U					0.16	U				
1,1,2-Trichloroethane	ug/l	1	0.19	U											0.19	U					0.19	U				
1,1-Dichloroethane	ug/l	5	0.13	U											0.13	U					0.13	U				
1,1-Dichloroethene	ug/l	5	0.09	U											0.09	U					0.09	U				
1,2,4-Trichlorobenzene	ug/l	NS	0.34	U											0.34	U					0.34	U				
1,2-Dibromo-3-Chloropropane	ug/l	0.04	0.4	U											0.4	U					0.4	U				
1,2-Dibromoethane	ug/l	NS	0.28	U											0.28	U					0.28	U				
1,2-Dichlorobenzene	ug/l	NS	0.21	U											0.21	U					0.21	U				
1,2-Dichloroethane	ug/l	0.6	0.19	U											0.19	U					0.19	U				
1,2-Dichloropropane	ug/l	1	0.09	U											0.09	U					0.09	U				
1,3-Dichlorobenzene	ug/l	NS	0.14	U											0.14	U					0.14	U				
1,4-Dichlorobenzene	ug/l	3	0.23	U											0.23	U					0.23	U				
2-Butanone	ug/l	NS	2.3	U											2.3	U					2.3	U				
2-Hexanone	ug/l	NS or 50*	0.5	U											0.5	U					0.5	U				
4-Methyl-2-pentanone (MIBK)	ug/l	NS	0.99	U											0.99	U *					0.99	U *				
Acetone	ug/l	50*	2.7	U											2.7	U					2.7	U				
Benzene	ug/l	1	0.08	U											0.08	U					0.08	U				
Bromodichloromethane	ug/l	NS	0.12	U											0.12	U					0.12	U				
Bromoform	ug/l	NS	0.19	U											0.19	U					0.19	U				
Bromomethane	ug/l	5	0.18	U											0.18	U					0.18	U				
Carbon disulfide	ug/l	60	0.13	U					Not Sampled						0.13	U					1.5					
Carbon tetrachloride	ug/l	5	0.06	U											0.06	U					0.06	U				
Chlorobenzene	ug/l	5	0.11	U											0.11	U					0.11	U				
Chloroethane	ug/l	5	0.17	U											0.17	U					0.17	U				
Chloroform	ug/l	7	0.08	U											0.08	U					0.08	U				
Chloromethane	ug/l	NS	0.1	U											0.1	U					0.1	U				
cis-1,2-Dichloroethene	ug/l	5	0.18	U											0.18	U					0.18	U				
cis-1,3-Dichloropropene	ug/l	NS	0.18	U											0.18	U					0.18	U				
Cyclohexane	ug/l	NS	0.16	U											0.16	U					0.16	U				
Dibromochloromethane	ug/l	NS or 50*	0.2	U											0.2	U					0.2	U				
Dichlorodifluoromethane	ug/l	5	0.22	U											0.22	U					0.22	U				
Ethylbenzene	ug/l	5	0.1	U											0.1	U					0.1	U				
Freon TF	ug/l	NS	0.08	U											0.08	U					0.08	U				
Isopropylbenzene	ug/l	5	0.08	U											0.08	U					0.08	U				
Methyl acetate	ug/l	NS	0.34	U											0.34	U					0.34	U				
Methylcyclohexane	ug/l	NS	0.14	U											0.14	U					0.14	U				
Methylene Chloride	ug/l	5	0.18	U											0.18	U					0.18	U				
MTBE	ug/l	NS	0.14	U											0.14	U					0.14	U				
Styrene	ug/l	5	0.12	U											0.12	U					0.12	U				
Tetrachloroethene (PCE)	ug/l	5	0.1	U											0.61	J					0.1	U				
Toluene	ug/l	5	2.5												0.15	U					0.15	U				
trans-1,2-Dichloroethene	ug/l	5	0.13	U											0.13	U					0.13	U				
trans-1,3-Dichloropropene	ug/l	0.4	0.24	U											0.24	U					0.24	U				
Trichloroethene (TCE)	ug/l	5	0.09	U											0.09	U					0.09	U				
Trichlorofluoromethane	ug/l	5	0.15	U											0.15	U					0.15	U				
Vinyl chloride	ug/l	2	0.14	U											0.14	U					0.14	U				
Xylenes, Total	ug/l	NS	0.36	U											0.36	U					0.36	U				
Total Conc	ug/l	NS	2.5												0.61						1.5					
Total TICs	ug/l	NS	0.0*T												0.0*T						0.0*T					

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-102S		MW-102S		MW-102S		MW-102D		MW-102D		MW-102D		MW-103		MW-103		MW-103		MW-104S		MW-104S		MW-104S	
		Lab Sample ID	460-41785-11						460-41785-7						460-41879-5						460-41884-3		460-149439-4		460-215089-1	
		Sampling Date	6/27/2012		1/31/2018		8/3/2020		6/26/2012		1/31/2018		8/3/2020		6/29/2012		1/31/2018		8/3/2020		6/27/2012		1/31/2018		8/3/2020	
		Matrix	Water						Water						Water						Water		Water		Water	
		Dilution Factor	1						1						1						1		1		1	
VOA-8260B-WATER	**Units**	**AWQSGVs**	Result	Q					Result	Q					Result	Q					Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	ug/l	5	0.06	U	Not Sampled		Not Sampled		0.06	U	Not Sampled		Not Sampled		0.06	U	Not Sampled		Not Sampled		0.06	U	0.28	U	0.24	U
1,1,2,2-Tetrachloroethane	ug/l	5	0.16	U					0.16	U					0.16	U					0.16	U	0.19	U	0.37	U
1,1,2-Trichloroethane	ug/l	1	0.19	U					0.19	U					0.19	U					0.19	U	0.08	U	0.43	U
1,1-Dichloroethane	ug/l	5	0.13	U					0.13	U					0.13	U					0.13	U	0.24	U	0.26	U
1,1-Dichloroethene	ug/l	5	0.09	U					0.09	U					0.09	U					0.09	U	0.34	U	0.26	U
1,2,4-Trichlorobenzene	ug/l	NS	0.34	U					0.34	U					0.34	U					0.34	U	0.27	U	0.37	U
1,2-Dibromo-3-Chloropropane	ug/l	0.04	0.4	U					0.4	U					0.4	U					0.4	U	0.23	U	0.38	U
1,2-Dibromoethane	ug/l	NS	0.28	U					0.28	U					0.28	U					0.28	U	0.23	U	0.28	U
1,2-Dichlorobenzene	ug/l	NS	0.21	U					0.21	U					0.21	U					0.21	U	0.22	U	0.43	U
1,2-Dichloroethane	ug/l	0.6	0.19	U					0.19	U					0.19	U					0.19	U	0.25	U	0.43	U
1,2-Dichloropropane	ug/l	1	0.09	U					0.09	U					0.09	U					0.09	U	0.18	U	0.35	U
1,3-Dichlorobenzene	ug/l	NS	0.14	U					0.14	U					0.14	U					0.14	U	0.33	U	0.34	U
1,4-Dichlorobenzene	ug/l	3	0.23	U					0.23	U					0.23	U					0.23	U	0.33	U	0.33	U
2-Butanone	ug/l	NS	2.3	U					2.3	U					2.3	U					2.3	U	2.20	U	1.90	U
2-Hexanone	ug/l	NS or 50*	0.5	U					0.5	U					0.5	U					0.5	U	0.72	U	1.10	U
4-Methyl-2-pentanone (MIBK)	ug/l	NS	0.99	U					0.99	U					0.99	U					0.99	U	0.63	U	1.30	U
Acetone	ug/l	50*	2.7	U					2.7	U					2.7	U					2.7	U	1.10	U	4.40	U
Benzene	ug/l	1	0.61	J					**2.1**						0.16	J					0.08	U	0.09	U	0.20	U
Bromodichloromethane	ug/l	NS	0.12	U					0.12	U					0.12	U					0.12	U	0.12	U	0.12	U
Bromoform	ug/l	NS	0.19	U					0.19	U					0.19	U					0.19	U	0.18	U	0.54	U
Bromomethane	ug/l	5	0.18	U					0.18	U					0.18	U					0.18	U	0.18	U	0.55	U
Carbon disulfide	ug/l	60	0.4	J					0.13	U					0.57	J					0.13	U	0.22	U	0.82	U
Carbon tetrachloride	ug/l	5	0.06	U					0.06	U					0.06	U					0.06	U	0.33	U	0.21	U
Chlorobenzene	ug/l	5	0.11	U					0.11	U					0.11	U					0.11	U	0.24	U	0.38	U
Chloroethane	ug/l	5	0.17	U					0.17	U					0.17	U					0.17	U	0.37	U	0.32	U
Chloroform	ug/l	7	0.08	U					0.08	U					0.08	U					0.08	U	0.22	U	0.33	U
Chloromethane	ug/l	NS	0.1	U					0.1	U					0.1	U					0.1	U	0.22	U	0.40	U
cis-1,2-Dichloroethene	ug/l	5	1						0.18	U					0.18	U					1.1		2.10		4.20	
cis-1,3-Dichloropropene	ug/l	NS	0.18	U					0.18	U					0.18	U					0.18	U	0.16	U	0.22	U
Cyclohexane	ug/l	NS	0.16	U					0.16	U					0.16	U					0.16	U	0.26	U	0.32	U
Dibromochloromethane	ug/l	NS or 50*	0.2	U					0.2	U					0.2	U					0.2	U	0.15	U	0.34	U
Dichlorodifluoromethane	ug/l	5	0.22	U					0.22	U					0.22	U					0.22	U	0.14	U	0.31	U
Ethylbenzene	ug/l	5	**270**						**140**						0.17	J					0.1	U	0.30	U	0.30	U
Freon TF	ug/l	NS	0.08	U					0.08	U					0.08	U					0.08	U	0.19	U	0.50	U
Isopropylbenzene	ug/l	5	**20**						**10**						1.5						0.08	U	0.32	U	0.34	U
Methyl acetate	ug/l	NS	0.34	U					0.34	U					0.34	U					0.34	U	0.58	U	0.79	U
Methylcyclohexane	ug/l	NS	0.16	J					0.14	U					0.14	U					0.14	U	0.22	U	0.26	U
Methylene Chloride	ug/l	5	0.18	U					0.18	U					0.18	U					0.18	U	0.45	J	0.32	U
MTBE	ug/l	NS	0.14	U					0.3	J					0.14	U					0.14	U	0.13	U	0.47	U
Styrene	ug/l	5	0.12	U					0.12	U					0.12	U					0.12	U	0.17	U	0.42	U
Tetrachloroethene (PCE)	ug/l	5	0.45	J					0.1	U					0.63	J					**23**		**5.8**		**6.4**	
Toluene	ug/l	5	**29**						1.6						0.15	U					0.15	U	0.25	U	0.38	U
trans-1,2-Dichloroethene	ug/l	5	3.4						0.14	J					0.39	J					0.13	U	0.18	U	0.24	U
trans-1,3-Dichloropropene	ug/l	0.4	0.24	U					0.24	U					0.24	U *					0.24	U	0.19	U	0.49	U
Trichloroethene (TCE)	ug/l	5	0.34	J					0.09	U					0.12	J					0.96	J	0.97	J	1.00	
Trichlorofluoromethane	ug/l	5	0.15	U					0.15	U					0.15	U					0.15	U	0.15	U	0.32	U
Vinyl chloride	ug/l	2	0.14	U					0.14	U					0.14	U					0.14	U	0.06	U	0.17	U
Xylenes, Total	ug/l	NS	120						79						15						0.36	U	0.60	U	0.66	J
Total Conc	ug/l	NS	445.36						233.14						18.54						25.06		9.32		11.60	
Total TICs	ug/l	NS	1446						1268						80						5.3		0.0*T			

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Series (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-104D		MW-104D		MW-104D		MW-105S		MW-105S		MW-105S		MW-106S		MW-106S		MW-106S		MW-107S		MW-107S		MW-107S	
		Lab Sample ID	460-41879-2		460-149439-5		460-215089-2		460-41785-10						460-41884-1		460-149439-6		460-215089-4		460-41785-4					
		Sampling Date	6/29/2012		1/31/2018		8/3/2020		6/27/2012		1/31/2018		8/3/2020		6/27/2012		1/31/2018		8/3/2020		6/26/2012		1/31/2018		8/3/2020	
		Matrix	Water		Water		Water		Water						Water		Water		Water		Water					
		Dilution Factor	1		1		1		1						1		1		1		1					
VOA-8260B-WATER	**Units**	**AWQSGVs**	Result	Q	Result	Q	Result	Q	Result	Q					Result	Q	Result	Q	Result	Q	Result	Q				
1,1,1-Trichloroethane	ug/l	5	0.06	U	0.28	U	0.24	U	0.06	U	Not Sampled		Not Sampled		0.06	U	0.28	U	0.24	U	0.06	U	Not Sampled		Not Sampled	
1,1,2,2-Tetrachloroethane	ug/l	5	0.16	U	0.19	U	0.37	U	0.16	U					0.16	U	0.19	U	0.37	U	0.16	U				
1,1,2-Trichloroethane	ug/l	1	0.19	U	0.08	U	0.43	U	0.19	U					0.19	U	0.08	U	0.43	U	0.19	U				
1,1-Dichloroethane	ug/l	5	0.13	U	0.24	U	0.26	U	0.13	U					0.13	U	0.24	U	0.26	U	0.13	U				
1,1-Dichloroethene	ug/l	5	0.09	U	0.34	U	0.26	U	0.09	U					0.09	U	0.34	U	0.26	U	0.09	U				
1,2,4-Trichlorobenzene	ug/l	NS	0.34	U	0.27	U	0.37	U	0.34	U					0.34	U	0.27	U	0.37	U	0.34	U				
1,2-Dibromo-3-Chloropropane	ug/l	0.04	0.4	U	0.23	U	0.38	U	0.4	U					0.4	U	0.23	U	0.38	U	0.4	U				
1,2-Dibromoethane	ug/l	NS	0.28	U	0.23	U	0.28	U	0.28	U					0.28	U	0.23	U	0.28	U	0.28	U				
1,2-Dichlorobenzene	ug/l	NS	0.21	U	0.22	U	0.43	U	0.21	U					0.21	U	0.22	U	0.43	U	0.21	U				
1,2-Dichloroethane	ug/l	0.6	0.19	U	0.25	U	0.43	U	0.19	U					0.19	U	0.25	U	0.43	U	0.19	U				
1,2-Dichloropropane	ug/l	1	0.09	U	0.18	U	0.35	U	0.09	U					0.09	U	0.18	U	0.35	U	0.09	U				
1,3-Dichlorobenzene	ug/l	NS	0.14	U	0.33	U	0.34	U	0.14	U					0.14	U	0.33	U	0.34	U	0.14	U				
1,4-Dichlorobenzene	ug/l	3	0.23	U	0.33	U	0.33	U	0.23	U					0.23	U	0.33	U	0.33	U	0.23	U				
2-Butanone	ug/l	NS	2.3	U	2.20	U	1.90	U	2.3	U					2.3	U	2.20	U	1.90	U	2.3	U				
2-Hexanone	ug/l	NS or 50*	0.5	U	0.72	U	1.10	U	0.5	U					0.5	U	0.72	U	1.10	U	0.5	U				
4-Methyl-2-pentanone (MIBK)	ug/l	NS	0.99	U	0.63	U	1.30	U	0.99	U *					0.99	U	0.63	U	1.30	U	0.99	U *				
Acetone	ug/l	50*	2.7	U	1.10	U	4.40	U	2.7	U					2.7	U	1.10	U	4.40	U	2.7	U				
Benzene	ug/l	1	0.08	U	0.09	U	0.20	U	0.08	U					0.56	J	0.40	J	0.20	U	0.27	J				
Bromodichloromethane	ug/l	NS	0.12	U	0.12	U	0.12	U	0.12	U					0.12	U	0.12	U	0.12	U	0.12	U				
Bromoform	ug/l	NS	0.19	U	0.18	U	0.54	U	0.19	U					0.19	U	0.18	U	0.54	U	0.19	U				
Bromomethane	ug/l	5	0.18	U	0.18	U	0.55	U	0.18	U					0.18	U	0.18	U	0.55	U	0.18	U				
Carbon disulfide	ug/l	60	0.52	J	0.22	U	0.82	U	0.13	U					0.13	U	0.22	U	0.82	U	0.13	U				
Carbon tetrachloride	ug/l	5	0.06	U	0.33	U	0.21	U	0.06	U					0.06	U	0.33	U	0.21	U	0.06	U				
Chlorobenzene	ug/l	5	0.11	U	0.24	U	0.38	U	0.11	U					0.11	U	0.24	U	0.38	U	0.11	U				
Chloroethane	ug/l	5	0.17	U	0.37	U	0.32	U	0.17	U					0.17	U	0.37	U	0.32	U	0.17	U				
Chloroform	ug/l	7	0.08	U	0.22	U	0.33	U	0.08	U					0.08	U	0.22	U	0.33	U	0.08	U				
Chloromethane	ug/l	NS	0.1	U	0.22	U	0.40	U	0.1	U					0.1	U	0.22	U	0.40	U	0.1	U				
cis-1,2-Dichloroethene	ug/l	5	0.24	J	0.26	U	0.22	U	0.18	U					**6.4**		4.60		0.40	J	0.18	U				
cis-1,3-Dichloropropene	ug/l	NS	0.18	U	0.16	U	0.22	U	0.18	U					0.18	U	0.16	U	0.22	U	0.18	U				
Cyclohexane	ug/l	NS	0.16	U	0.26	U	0.32	U	0.16	U					0.16	U	0.26	U	0.32	U	0.16	U				
Dibromochloromethane	ug/l	NS or 50*	0.2	U	0.15	U	0.34	U	0.2	U					0.2	U	0.15	U	0.34	U	0.2	U				
Dichlorodifluoromethane	ug/l	5	0.22	U	0.14	U	0.31	U	0.22	U					0.22	U	0.14	U	0.31	U	0.22	U				
Ethylbenzene	ug/l	5	0.1	U	0.30	U	4.60		**40**						**69**		0.31	J	0.30	U	0.95	J				
Freon TF	ug/l	NS	0.08	U	0.19	U	0.50	U	0.08	U					0.08	U	0.19	U	0.50	U	0.08	U				
Isopropylbenzene	ug/l	5	0.088	J	0.32	U	0.44	J	4.5						2.3		0.38	J	0.84	J	0.52	J				
Methyl acetate	ug/l	NS	0.34	U	0.58	U	0.79	U	0.34	U					0.34	U	0.58	U	0.79	U	0.34	U				
Methylcyclohexane	ug/l	NS	0.14	U	0.22	U	0.26	U	0.14	U					0.14	U	0.22	U	0.26	U	0.14	U				
Methylene Chloride	ug/l	5	0.18	U *	0.57	J	0.32	U	0.18	U					0.18	U	0.50	J	0.32	U	0.18	U				
MTBE	ug/l	NS	0.14	U	0.13	U	0.47	U	0.14	U					0.14	U	0.13	U	0.47	U	0.14	U				
Styrene	ug/l	5	0.12	U	0.17	U	4.90		0.12	U					0.39	J	0.17	U	0.42	U	0.12	U				
Tetrachloroethene (PCE)	ug/l	5	1.4		0.59	J	0.25	U	0.1	U					2.7		0.12	U	0.43	J	0.1	U				
Toluene	ug/l	5	0.15	U	0.25	U	0.38	U	3.1						**9.5**		0.25	U	0.38	U	0.15	U				
trans-1,2-Dichloroethene	ug/l	5	0.13	U	0.18	U	0.24	U	0.13	U					2.9		0.20	J	1.80		0.13	U				
trans-1,3-Dichloropropene	ug/l	0.4	0.24	U	0.19	U	0.49	U	0.24	U					0.24	U	0.19	U	0.49	U	0.24	U				
Trichloroethene (TCE)	ug/l	5	0.37	J	0.22	U	0.31	U	0.09	U					0.85	J	0.22	U	0.31	U	0.09	U				
Trichlorofluoromethane	ug/l	5	0.15	U	0.15	U	0.32	U	0.15	U					0.15	U	0.15	U	0.32	U	0.15	U				
Vinyl chloride	ug/l	2	0.14	U	0.06	U	0.17	U	0.14	U					**6.5**		**4.0**		1.0		0.14	U				
Xylenes, Total	ug/l	NS	0.36	U	0.60	U	11		39						42		0.68	J	0.66	U	1.2	J				
Total Conc	ug/l	NS	2.618		1.16		20.94		86.6						143.1		10.79		4.47		2.94					
Total TICs	ug/l	NS	0.0*T		0.0*T				579.1						76.1		18.70				0.0*T					

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Series (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

Client ID			MW-2		MW-2	MW-2	MW-2D		MW-2D	MW-2D	MW-3		MW-3	MW-3	MW-4		MW-4S		MW-4S
Lab Sample ID			460-41884-7				460-41884-6				460-41785-6				460-41879-3		460-149439-1		
Sampling Date			6/28/2012		1/31/2018	8/6/2020	6/28/2012		1/31/2018	8/6/2020	6/26/2012		1/31/2018	8/6/2020	6/29/2012		1/31/2018		8/6/2020
Matrix			Water				Water				Water				Water		Water		
Dilution Factor			1				1				1				1		1		
SVOA-8270C-WATER	**Units**	**AWQSGVs**	Result	Q			Result	Q			Result	Q			Result	Q	ug/l		
2,4,5-Trichlorophenol	ug/l	NS	2.6	U			2.6	U			2.6	U			2.6	U	0.49	U	
2,4,6-Trichlorophenol	ug/l	NS	2.4	U	Not Sampled	Not Sampled	2.4	U	Not Sampled	Not Sampled	2.4	U	Not Sampled	Not Sampled	2.4	U	0.53	U	Not Sampled
2,4-Dichlorophenol	ug/l	1	2.6	U			2.6	U			2.6	U			2.6	U	0.63	U	
2,4-Dimethylphenol	ug/l	1	3.4	U			3.4	U			3.4	U			3.4	U	0.91	U	
2,4-Dinitrophenol	ug/l	1	5.4	U			5.4	U			5.5	U			5.4	U	2.4	U	
2,4-Dinitrotoluene	ug/l	5	0.47	U			0.47	U			0.47	U			0.47	U	1	U	
2,6-Dinitrotoluene	ug/l	5	0.61	U			0.61	U			0.62	U			0.61	U	0.88	U	
2-Chloronaphthalene	ug/l	NS or 10*	2.7	U			2.7	U			2.7	U			2.7	U	0.61	U	
2-Chlorophenol	ug/l	NS	2.2	U			2.2	U			2.2	U			2.2	U	0.74	U	
2-Methylnaphthalene	ug/l	NS	3	U			3	U			3	U			60		0.88	U	
2-Methylphenol	ug/l	NS	1.8	U			1.8	U			1.8	U			1.8	U	1.3	U	
2-Nitroaniline	ug/l	5	4.9	U			4.9	U			4.9	U			4.9	U	0.65	U	
2-Nitrophenol	ug/l	NS	2.4	U			2.4	U			2.4	U			2.4	U	0.59	U	
3,3'-Dichlorobenzidine	ug/l	5	4.9	U			4.9	U			4.9	U			4.9	U	1	U	
3-Nitroaniline	ug/l	5	5	U *			5	U *			5.1	U			5	U *	0.82	U	
4,6-Dinitro-2-methylphenol	ug/l	NS	4.7	U			4.7	U			4.7	U			4.7	U	2	U	
4-Bromophenyl phenyl ether	ug/l	NS	2.5	U			2.5	U			2.5	U			2.5	U	1	U	
4-Chloro-3-methylphenol	ug/l	NS	2.5	U			2.5	U			2.5	U			2.5	U	0.76	U	
4-Chloroaniline	ug/l	5	2	U			2	U			2	U			2	U	0.73	U	
4-Chlorophenyl phenyl ether	ug/l	NS	2.5	U			2.5	U			2.5	U			2.5	U	0.96	U	
4-Methylphenol	ug/l	NS	1.6	U			1.6	U			1.6	U			1.6	U	0.87	U	
4-Nitroaniline	ug/l	5	5.8	U			5.8	U			5.9	U			5.8	U	0.48	U	
4-Nitrophenol	ug/l	NS	6.7	U			6.7	U			6.8	U			6.7	U	4.7	U	
Acenaphthene	ug/l	20	**130**				2.7	U			2.7	U			3.3	J	11		
Acenaphthylene	ug/l	NS	4.7	J			2.7	U			2.7	U			48		2.4	J	
Acetophenone	ug/l	NS	2.7	U			2.7	U			2.7	U			2.7	U	1	U	
Anthracene	ug/l	NS or 50*	2.8	U			2.8	U			2.8	U			2.8	U	0.78	J	
Atrazine	ug/l	7.5	3	U			3	U			3	U			3	U	0.77	U	
Benzaldehyde	ug/l	NS	2	U *			2	U *			2	U *			2	U *	0.86	U	
Benzo[a]anthracene	ug/l	NS or 0.002*	0.27	U			0.27	U			0.27	U			0.27	U	0.55	U	
Benzo[a]pyrene	ug/l	ND	0.14	U			0.14	U			0.14	U				J	0.16	U	
Benzo[b]fluoranthene	ug/l	NS or 0.002*	0.26	U			0.26	U			0.26	U			**0.29**	J	0.44	U	
Benzo[g,h,i]perylene	ug/l	NS	2	U			2	U			2	U			2	U	0.75	U	
Benzo[k]fluoranthene	ug/l	NS or 0.002*	0.26	U			0.26	U			0.26	U			0.26	U	0.18	U	
bis (2-chloroisopropyl) ether	ug/l	NS	2	U			2	U			2	U			2	U	0.12	U	
Bis(2-chloroethoxy)methane	ug/l	5	2.6	U			2.6	U			2.6	U			2.6	U	0.69	U	
Bis(2-chloroethyl)ether	ug/l	1	0.28	U			0.28	U			0.28	U			0.28	U	0.69	U	
Bis(2-ethylhexyl) phthalate	ug/l	5	2	U			2	U			2	U			2	U	0.72	U	
Butyl benzyl phthalate	ug/l	NS or 50*	2.5	U			2.5	U			2.5	U			2.5	U	0.6	U	
Caprolactam	ug/l	NS	2.5	U			2.5	U			2.5	U			2.5	U	1.1	U	
Carbazole	ug/l	NS	3.2	U			3.2	U			3.2	U			3.2	U	0.85	U	
Chrysene	ug/l	NS or 0.002*	3.1	U			3.1	U			3.1	U			3.1	U	0.67	U	
Dibenz(a,h)anthracene	ug/l	NS	0.09	U			0.09	U			0.091	U			0.09	U	0.09	U	
Dibenzofuran	ug/l	NS	2.8	U			2.8	U			2.8	U			2.8	U	1.1	J	
Diethyl phthalate	ug/l	NS or 50*	2.9	U			2.9	U			2.9	U			2.9	U	1	U	
Dimethyl phthalate	ug/l	NS or 50*	2.8	U			2.8	U			2.8	U			2.8	U	0.98	U	
Di-n-butyl phthalate	ug/l	50	2.9	U			2.9	U			2.9	U			2.9	U	0.82	U	
Di-n-octyl phthalate	ug/l	NS or 50*	1.5	U			1.5	U			1.5	U			1.5	U	0.69	U	
Diphenyl	ug/l	5	2.8	U			2.8	U			2.8	U			**6.0**	J	0.69	U	
Fluoranthene	ug/l	NS or 50*	3.2	U			3.2	U			3.2	U			3.2	U	0.72	U	
Fluorene	ug/l	NS or 50*	5	J			2.8	U			2.8	U			8.8	J	2	J	
Hexachlorobenzene	ug/l	0.4	0.29	U			0.29	U			0.29	U			0.29	U	0.47	U	
Hexachlorobutadiene	ug/l	0.5	0.57	U			0.57	U			0.58	U			0.57	U	0.76	U	
Hexachlorocyclopentadiene	ug/l	0.45	1.7	U *			1.7	U *			1.7	U			1.7	U *	0.61	U	
Hexachloroethane	ug/l	5	0.25	U			0.25	U			0.25	U			0.25	U	0.09	U	
Indeno[1,2,3-cd]pyrene	ug/l	NS or 0.002*	0.15	U			0.15	U			0.15	U			0.15	U	0.21	U	
Isophorone	ug/l	NS or 50*	2.7	U			2.7	U			2.7	U			2.7	U	0.67	U	
Naphthalene	ug/l	NS or 10*	5.2	J			2.7	U			2.7	U			**240**		1.3	J	
Nitrobenzene	ug/l	0.4	0.3	U			0.3	U			0.3	U			0.3	U	0.49	U	
N-Nitrosodi-n-propylamine	ug/l	NS	0.25	U			0.25	U			0.25	U			0.25	U	0.83	U	
N-Nitrosodiphenylamine	ug/l	NS or 50*	2.9	U			2.9	U			2.9	U			2.9	U	0.74	U	
Pentachlorophenol	ug/l	1	5.3	U			5.3	U			5.4	U			5.3	U	2.2	U	
Phenanthrene	ug/l	NS or 50*	3.1	U			3.1	U			3.1	U			3.1	U	3.6	J	
Phenol	ug/l	1	0.81	U			0.81	U			0.82	U			0.81	U	0.41	U	
Pyrene	ug/l	NS or 50*	2.9	U			2.9	U			2.9	U			2.9	U	0.91	J	
Total Conc	ug/l	NS	144.9				0				0				366.66		26.29		
Total Estimated Conc. (TICs)	uf/l	NS	108.9				0.0*T				0.0*T				397.5		25		

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-4D		MW-4D		MW-4D		MW-5		MW-5		MW-5		MW-6		MW-6		MW-6		MW-7		MW-7		MW-7	
		Lab Sample ID	460-41879-4-DL		460-149439-2				460-41884-5		460-149439-3				460-41785-5						460-41884-2					
		Sampling Date	6/29/2012		1/31/2018		8/6/2020		6/27/2012		1/31/2018		8/6/2020		6/26/2012		1/31/2018		8/6/2020		6/27/2012		1/31/2018		8/6/2020	
		Matrix	Water		Water				Water		Water				Water						Water					
		Dilution Factor	10		5				1		1				2						1					
SVOA-8270C-WATER	**Units**	**AWQSGVs**	Result	Q	ug/l				Result	Q	ug/l				Result	Q					Result	Q				
2,4,5-Trichlorophenol	ug/l	NS	26	U	2.5	U			2.6	U	0.49	U			5.3	U					2.6	U				
2,4,6-Trichlorophenol	ug/l	NS	24	U	2.7	U	Not Sampled		2.4	U	0.53	U	Not Sampled		4.8	U	Not Sampled		Not Sampled		2.4	U	Not Sampled		Not Sampled	
2,4-Dichlorophenol	ug/l	1	26	U	3.2	U			2.6	U	0.63	U			5.3	U					2.6	U				
2,4-Dimethylphenol	ug/l	1	34	U	4.6	U			3.4	U	0.91	U			6.9	U					3.4	U				
2,4-Dinitrophenol	ug/l	1	54	U	12	U			5.5	U *	2.4	U			11	U					5.5	U *				
2,4-Dinitrotoluene	ug/l	5	4.7	U	5.2	U			0.47	U	1	U			0.95	U					0.47	U				
2,6-Dinitrotoluene	ug/l	5	6.1	U	4.4	U			0.62	U	0.88	U			1.2	U					0.62	U				
2-Chloronaphthalene	ug/l	NS or 10*	27	U	3.1	U			2.7	U	0.61	U			5.5	U					2.7	U				
2-Chlorophenol	ug/l	NS	22	U	3.7	U			2.2	U	0.74	U			4.4	U					2.2	U				
2-Methylnaphthalene	ug/l	NS	72	J D	27	J			3	U	0.88	U			140						3	U				
2-Methylphenol	ug/l	NS	18	U	6.5	U			1.8	U	1.3	U			3.6	U					1.8	U				
2-Nitroaniline	ug/l	5	49	U	3.3	U			4.9	U	0.65	U			9.9	U					4.9	U				
2-Nitrophenol	ug/l	NS	24	U	3	U			2.4	U	0.59	U			4.8	U					2.4	U				
3,3'-Dichlorobenzidine	ug/l	5	49	U	5.2	U			4.9	U	1	U			9.9	U					4.9	U				
3-Nitroaniline	ug/l	5	50	U *	4.1	U			5.1	U	0.82	U			10	U					5.1	U				
4,6-Dinitro-2-methylphenol	ug/l	NS	47	U	10	U			4.7	U	2	U			9.5	U					4.7	U				
4-Bromophenyl phenyl ether	ug/l	NS	25	U	5.1	U			2.5	U	1	U			5.1	U					2.5	U				
4-Chloro-3-methylphenol	ug/l	NS	25	U	3.8	U			2.5	U	0.76	U			5.1	U					2.5	U				
4-Chloroaniline	ug/l	5	20	U	3.7	U			2	U	0.73	U			4	U					2	U				
4-Chlorophenyl phenyl ether	ug/l	NS	25	U	4.8	U			2.5	U	0.96	U			5.1	U					2.5	U				
4-Methylphenol	ug/l	NS	16	U	4.4	U			1.6	U	0.87	U			3.2	U					1.6	U				
4-Nitroaniline	ug/l	5	58	U	2.4	U			5.9	U *	0.48	U			12	U					5.9	U *				
4-Nitrophenol	ug/l	NS	67	U	23	U			6.8	U	4.7	U			14	U					6.8	U				
Acenaphthene	ug/l	20	27	U	17	J			**23**		19				**110**						2.7	U				
Acenaphthylene	ug/l	NS	31	J D	9	J			32		7.5	J			5.5	U					2.7	U				
Acetophenone	ug/l	NS	27	U	5.2	U			2.7	U	1	U			5.5	U					2.7	U				
Anthracene	ug/l	NS or 50*	28	U	2.9	U			2.8	U	0.57	U			5.7	U					2.8	U				
Atrazine	ug/l	7.5	30	U	3.9	U			3	U	0.77	U			6.1	U					3	U				
Benzaldehyde	ug/l	NS	20	U *	4.3	U			2	U *	0.86	U			4	U *					2	U *				
Benzo[a]anthracene	ug/l	NS or 0.002*	2.7	U	2.8	U			0.27	U	0.55	U			0.55	U					0.27	U				
Benzo[a]pyrene	ug/l	ND	1.4	U	0.8	U			0.14	U	0.16	U			0.28	U					0.14	U				
Benzo[b]fluoranthene	ug/l	NS or 0.002*	2.6	U	2.2	U			0.26	U	0.44	U			0.53	U					0.26	U				
Benzo[g,h,i]perylene	ug/l	NS	20	U	3.8	U			2	U	0.75	U			4	U					2	U				
Benzo[k]fluoranthene	ug/l	NS or 0.002*	2.6	U	0.9	U			0.26	U	0.18	U			0.53	U					0.26	U				
bis (2-chloroisopropyl) ether	ug/l	NS	20	U	0.6	U			2	U	0.12	U			4	U					2	U				
Bis(2-chloroethoxy)methane	ug/l	5	26	U	0.69	U			2.6	U	0.69	U			5.3	U					2.6	U				
Bis(2-chloroethyl)ether	ug/l	1	2.8	U	3.5	U			0.28	U	0.69	U			0.57	U					0.28	U				
Bis(2-ethylhexyl) phthalate	ug/l	5	20	U	3.6	U			2	U	0.72	U			4	U					2	U				
Butyl benzyl phthalate	ug/l	NS or 50*	25	U	3	U			2.5	U	0.6	U			5.1	U					2.5	U				
Caprolactam	ug/l	NS	25	U	5.3	U			2.5	U	1.1	U			5.1	U					2.5	U				
Carbazole	ug/l	NS	32	U	4.3	U			3.2	U	0.85	U			6.5	U					3.2	U				
Chrysene	ug/l	NS or 0.002*	31	U	3.4	U			3.1	U	0.67	U			6.3	U					3.1	U				
Dibenz(a,h)anthracene	ug/l	NS	0.9	U	0.45	U			0.091	U	0.09	U			0.18	U					0.091	U				
Dibenzofuran	ug/l	NS	28	U	4.3	U			2.8	U	0.85	U			5.7	U					2.8	U				
Diethyl phthalate	ug/l	NS or 50*	29	U	5	U			2.9	U	1.0	U			5.9	U					2.9	U				
Dimethyl phthalate	ug/l	NS or 50*	28	U	4.9	U			2.8	U	0.98	U			5.7	U					2.8	U				
Di-n-butyl phthalate	ug/l	50	29	U	4.1	U			2.9	U	0.82	U			5.9	U					2.9	U				
Di-n-octyl phthalate	ug/l	NS or 50*	15	U	3.5	U			1.5	U	0.69	U			3	U					1.5	U				
Diphenyl	ug/l	5	28	U	0.69	U			2.8	U	0.69	U			**5.7**	J					2.8	U				
Fluoranthene	ug/l	NS or 50*	32	U	3.6	U			3.2	U	0.72	U			6.5	U					3.2	U				
Fluorene	ug/l	NS or 50*	28	U	5.1	J			2.8	U	1.3	J			13	J					2.8	U				
Hexachlorobenzene	ug/l	0.4	2.9	U	2.4	U			0.29	U	0.47	U			0.59	U					0.29	U				
Hexachlorobutadiene	ug/l	0.5	5.7	U	3.8	U			0.58	U	0.76	U			1.2	U					0.58	U				
Hexachlorocyclopentadiene	ug/l	0.45	17	U *	3.1	U			1.7	U	0.61	U			3.4	U					1.7	U				
Hexachloroethane	ug/l	5	2.5	U	0.45	U			0.25	U	0.09	U			0.51	U					0.25	U				
Indeno[1,2,3-cd]pyrene	ug/l	NS or 0.002*	1.5	U	1.1	U			0.15	U	0.21	U			0.3	U					0.15	U				
Isophorone	ug/l	NS or 50*	27	U	3.4	U			2.7	U	0.67	U			5.5	U					2.7	U				
Naphthalene	ug/l	NS or 10*	**1500**	D	**770**				**34**		0.8	U			**410**						2.7	U				
Nitrobenzene	ug/l	0.4	3	U	2.5	U			0.3	U	0.49	U			0.61	U					0.3	U				
N-Nitrosodi-n-propylamine	ug/l	NS	2.5	U	4.2	U			0.25	U	0.83	U			0.51	U					0.25	U				
N-Nitrosodiphenylamine	ug/l	NS or 50*	29	U	3.7	U			2.9	U	0.74	U			5.9	U					2.9	U				
Pentachlorophenol	ug/l	1	53	U	11	U			5.4	U	2.2	U			11	U					5.4	U				
Phenanthrene	ug/l	NS or 50*	31	U	3.3	U			3.1	U	0.65	U			6.3	U					3.1	U				
Phenol	ug/l	1	8.1	U	2.1	U			0.82	U	0.41	U			1.6	U					0.82	U				
Pyrene	ug/l	NS or 50*	29	U	4.2	U			2.9	U	0.83	U			5.9	U					2.9	U				
Total Conc	ug/l	NS	1603		833.7				89		27.8				678.7						0					
Total Estimated Conc. (TICs)	uf/l	NS	1799		535				146.1		0.0*T				1555						0.0*T					

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-8S		MW-8S		MW-8S		MW-8D		MW-8D		MW-8D		MW-101S		MW-101S		MW-101S		MW-101D		MW-101D		MW-101D	
		Lab Sample ID	460-42023-3												460-41785-3						460-41785-2					
		Sampling Date	6/29/2012		1/31/2018		8/6/2020				1/31/2018		8/6/2020		6/26/2012		1/31/2018		8/6/2020		6/26/2012		1/31/2018		8/6/2020	
		Matrix	Water												Water						Water					
		Dilution Factor	1												1						1					
SVOA-8270C-WATER	**Units**	**AWQSGVs**	Result	Q											Result	Q					Result	Q				
2,4,5-Trichlorophenol	ug/l	NS	2.6	U											2.7	U					2.7	U				
2,4,6-Trichlorophenol	ug/l	NS	2.4	U	Not Sampled		Not Sampled		Not Sampled		Not Sampled		Not Sampled		2.4	U	Not Sampled		Not Sampled		2.4	U	Not Sampled		Not Sampled	
2,4-Dichlorophenol	ug/l	1	2.6	U											2.7	U					2.7	U				
2,4-Dimethylphenol	ug/l	1	3.4	U											3.5	U					3.5	U				
2,4-Dinitrophenol	ug/l	1	5.4	U											5.5	U					5.5	U				
2,4-Dinitrotoluene	ug/l	5	0.47	U											0.48	U					0.48	U				
2,6-Dinitrotoluene	ug/l	5	0.61	U											0.62	U					0.62	U				
2-Chloronaphthalene	ug/l	NS or 10*	2.7	U											2.8	U					2.8	U				
2-Chlorophenol	ug/l	NS	2.2	U											2.2	U					2.2	U				
2-Methylnaphthalene	ug/l	NS	3	U											3.1	U					3.1	U				
2-Methylphenol	ug/l	NS	1.8	U											1.8	U					1.8	U				
2-Nitroaniline	ug/l	5	4.9	U											5	U					5	U				
2-Nitrophenol	ug/l	NS	2.4	U											2.4	U					2.4	U				
3,3'-Dichlorobenzidine	ug/l	5	4.9	U											5	U					5	U				
3-Nitroaniline	ug/l	5	5	U *											5.1	U					5.1	U				
4,6-Dinitro-2-methylphenol	ug/l	NS	4.7	U											4.8	U					4.8	U				
4-Bromophenyl phenyl ether	ug/l	NS	2.5	U											2.6	U					2.6	U				
4-Chloro-3-methylphenol	ug/l	NS	2.5	U											2.6	U					2.6	U				
4-Chloroaniline	ug/l	5	2	U											2	U					2	U				
4-Chlorophenyl phenyl ether	ug/l	NS	2.5	U											2.6	U					2.6	U				
4-Methylphenol	ug/l	NS	1.6	U											1.6	U					1.6	U				
4-Nitroaniline	ug/l	5	5.8	U *											5.9	U					5.9	U				
4-Nitrophenol	ug/l	NS	6.7	U											6.8	U					6.8	U				
Acenaphthene	ug/l	20	2.7	U											2.8	U					2.8	U				
Acenaphthylene	ug/l	NS	2.7	U											2.8	U					2.8	U				
Acetophenone	ug/l	NS	2.7	U											2.8	U					2.8	U				
Anthracene	ug/l	NS or 50*	2.8	U											2.9	U					2.9	U				
Atrazine	ug/l	7.5	3	U											3.1	U					3.1	U				
Benzaldehyde	ug/l	NS	2	U											2	U *					2	U *				
Benzo[a]anthracene	ug/l	NS or 0.002*	0.27	U											0.28	U					0.28	U				
Benzo[a]pyrene	ug/l	ND	0.14	U											0.14	U					0.14	U				
Benzo[b]fluoranthene	ug/l	NS or 0.002*	0.26	U											0.27	U					0.27	U				
Benzo[g,h,i]perylene	ug/l	NS	2	U											2	U					2	U				
Benzo[k]fluoranthene	ug/l	NS or 0.002*	0.26	U											0.27	U					0.27	U				
bis (2-chloroisopropyl) ether	ug/l	NS	2	U											2	U					2	U				
Bis(2-chloroethoxy)methane	ug/l	5	2.6	U											2.7	U					2.7	U				
Bis(2-chloroethyl)ether	ug/l	1	0.28	U											0.29	U					0.29	U				
Bis(2-ethylhexyl) phthalate	ug/l	5	2	U											2	U					2	U				
Butyl benzyl phthalate	ug/l	NS or 50*	2.5	U											2.6	U					2.6	U				
Caprolactam	ug/l	NS	2.5	U											2.6	U					2.6	U				
Carbazole	ug/l	NS	3.2	U											3.3	U					3.3	U				
Chrysene	ug/l	NS or 0.002*	3.1	U											3.2	U					3.2	U				
Dibenz(a,h)anthracene	ug/l	NS	0.09	U											0.092	U					0.092	U				
Dibenzofuran	ug/l	NS	2.8	U											2.9	U					2.9	U				
Diethyl phthalate	ug/l	NS or 50*	2.9	U											3	U					3	U				
Dimethyl phthalate	ug/l	NS or 50*	2.8	U											2.9	U					2.9	U				
Di-n-butyl phthalate	ug/l	50	2.9	U											3	U					3	U				
Di-n-octyl phthalate	ug/l	NS or 50*	1.5	U											1.5	U					1.5	U				
Diphenyl	ug/l	5	2.8	U											2.9	U					2.9	U				
Fluoranthene	ug/l	NS or 50*	3.2	U											3.3	U					3.3	U				
Fluorene	ug/l	NS or 50*	2.8	U											2.9	U					2.9	U				
Hexachlorobenzene	ug/l	0.4	0.29	U											0.3	U					0.3	U				
Hexachlorobutadiene	ug/l	0.5	0.57	U											0.58	U					0.58	U				
Hexachlorocyclopentadiene	ug/l	0.45	1.7	U											1.7	U					1.7	U				
Hexachloroethane	ug/l	5	0.25	U											0.26	U					0.26	U				
Indeno[1,2,3-cd]pyrene	ug/l	NS or 0.002*	0.15	U											0.15	U					0.15	U				
Isophorone	ug/l	NS or 50*	2.7	U											2.8	U					2.8	U				
Naphthalene	ug/l	NS or 10*	2.7	U											2.8	U					2.8	U				
Nitrobenzene	ug/l	0.4	0.3	U											0.31	U					0.31	U				
N-Nitrosodi-n-propylamine	ug/l	NS	0.25	U											0.26	U					0.26	U				
N-Nitrosodiphenylamine	ug/l	NS or 50*	2.9	U											3	U					3	U				
Pentachlorophenol	ug/l	1	5.3	U											5.4	U					5.4	U				
Phenanthrene	ug/l	NS or 50*	3.1	U											3.2	U					3.2	U				
Phenol	ug/l	1	0.81	U											0.83	U					0.83	U				
Pyrene	ug/l	NS or 50*	2.9	U											3	U					3	U				
Total Conc	ug/l	NS	0												0						0					
Total Estimated Conc. (TICs)	uf/l	NS	0.0*T												0.0*T						9.2					

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-102S		MW-102S	MW-102S	MW-102D		MW-102D	MW-102D	MW-103		MW-103	MW-103	MW-104S		MW-104S		MW-104S
		Lab Sample ID	460-41785-11				460-41785-7				460-41879-5				460-41884-3		460-149439-4		
		Sampling Date	6/27/2012		1/31/2018	8/6/2020	6/26/2012		1/31/2018	8/6/2020	6/29/2012		1/31/2018	8/6/2020	6/27/2012		1/31/2018		8/6/2020
		Matrix	Water				Water				Water				Water		Water		
		Dilution Factor	2				2				1				1		1		
SVOA-8270C-WATER	**Units**	**AWQSGVs**	Result	Q			Result	Q			Result	Q			Result	Q	ug/l		
2,4,5-Trichlorophenol	ug/l	NS	5.3	U			5.3	U			2.6	U			2.6	U	0.49	U	
2,4,6-Trichlorophenol	ug/l	NS	4.8	U	Not Sampled	Not Sampled	4.8	U	Not Sampled	Not Sampled	2.4	U	Not Sampled	Not Sampled	2.4	U	0.53	U	Not Sampled
2,4-Dichlorophenol	ug/l	1	5.3	U			5.3	U			2.6	U			2.6	U	0.63	U	
2,4-Dimethylphenol	ug/l	1	6.9	U			6.9	U			3.4	U			3.4	U	0.91	U	
2,4-Dinitrophenol	ug/l	1	11	U			11	U			5.4	U			5.5	U *	2.4	U	
2,4-Dinitrotoluene	ug/l	5	0.95	U			0.95	U			0.47	U			0.47	U	1	U	
2,6-Dinitrotoluene	ug/l	5	1.2	U			1.2	U			0.61	U			0.62	U	0.88	U	
2-Chloronaphthalene	ug/l	NS or 10*	5.5	U			5.5	U			2.7	U			2.7	U	0.61	U	
2-Chlorophenol	ug/l	NS	4.4	U			4.4	U			2.2	U			2.2	U	0.74	U	
2-Methylnaphthalene	ug/l	NS	6.1	U			48				3	U			3	U	0.88	U	
2-Methylphenol	ug/l	NS	3.6	U			3.6	U			1.8	U			1.8	U	1.3	U	
2-Nitroaniline	ug/l	5	9.9	U			9.9	U			4.9	U			4.9	U	0.65	U	
2-Nitrophenol	ug/l	NS	4.8	U			4.8	U			2.4	U			2.4	U	0.59	U	
3,3'-Dichlorobenzidine	ug/l	5	9.9	U			9.9	U			4.9	U			4.9	U	1	U	
3-Nitroaniline	ug/l	5	10	U			10	U			5	U *			5.1	U	0.82	U	
4,6-Dinitro-2-methylphenol	ug/l	NS	9.5	U			9.5	U			4.7	U			4.7	U	2	U	
4-Bromophenyl phenyl ether	ug/l	NS	5.1	U			5.1	U			2.5	U			2.5	U	1	U	
4-Chloro-3-methylphenol	ug/l	NS	5.1	U			5.1	U			2.5	U			2.5	U	0.76	U	
4-Chloroaniline	ug/l	5	4	U			4	U			2	U			2	U	0.73	U	
4-Chlorophenyl phenyl ether	ug/l	NS	5.1	U			5.1	U			2.5	U			2.5	U	0.96	U	
4-Methylphenol	ug/l	NS	3.2	U			3.2	U			1.6	U			1.6	U	0.87	U	
4-Nitroaniline	ug/l	5	12	U			12	U			5.8	U			5.9	U *	0.48	U	
4-Nitrophenol	ug/l	NS	14	U			14	U			6.7	U			6.8	U	4.7	U	
Acenaphthene	ug/l	20	**110**				15	J			2.7	U			2.7	U	0.88	U	
Acenaphthylene	ug/l	NS	40				5.5	U			2.7	U			2.7	U	0.65	U	
Acetophenone	ug/l	NS	5.5	U			5.5	U			2.7	U			2.7	U	1	U	
Anthracene	ug/l	NS or 50*	5.7	U			5.7	U			2.8	U			2.8	U	0.57	U	
Atrazine	ug/l	7.5	6.1	U			6.1	U			3	U			3	U	0.77	U	
Benzaldehyde	ug/l	NS	4	U *			4	U *			2	U *			2	U *	0.86	U	
Benzo[a]anthracene	ug/l	NS or 0.002*	**1**	J			**1.2**	J			0.27	U			0.27	U	0.55	U	
Benzo[a]pyrene	ug/l	ND	0.28	U			0.72	J			0.14	U			0.14	U	0.16	U	
Benzo[b]fluoranthene	ug/l	NS or 0.002*	0.53	U			**0.7**	J			0.26	U			0.26	U	0.44	U	
Benzo[g,h,i]perylene	ug/l	NS	4	U			4	U			2	U			2	U	0.75	U	
Benzo[k]fluoranthene	ug/l	NS or 0.002*	0.53	U			0.53	U			0.26	U			0.26	U	0.18	U	
bis (2-chloroisopropyl) ether	ug/l	NS	4	U			4	U			2	U			2	U	0.12	U	
Bis(2-chloroethoxy)methane	ug/l	5	5.3	U			5.3	U			2.6	U			2.6	U	0.69	U	
Bis(2-chloroethyl)ether	ug/l	1	0.57	U			0.57	U			0.28	U			0.28	U	0.69	U	
Bis(2-ethylhexyl) phthalate	ug/l	5	4	U			4	U			2	U			2	U	0.72	U	
Butyl benzyl phthalate	ug/l	NS or 50*	5.1	U			5.1	U			2.5	U			2.5	U	0.6	U	
Caprolactam	ug/l	NS	5.1	U			5.1	U			2.5	U			2.5	U	1.1	U	
Carbazole	ug/l	NS	8	J			6.5	U			3.2	U			3.2	U	0.85	U	
Chrysene	ug/l	NS or 0.002*	6.3	U			6.3	U			3.1	U			3.1	U	0.67	U	
Dibenz(a,h)anthracene	ug/l	NS	0.18	U			0.18	U			0.09	U			0.091	U	0.09	U	
Dibenzofuran	ug/l	NS	7.5	J			5.7	U			2.8	U			2.8	U	0.85	U	
Diethyl phthalate	ug/l	NS or 50*	5.9	U			5.9	U			2.9	U			2.9	U	1	U	
Dimethyl phthalate	ug/l	NS or 50*	5.7	U			5.7	U			2.8	U			2.8	U	0.98	U	
Di-n-butyl phthalate	ug/l	50	5.9	U			5.9	U			2.9	U			2.9	U	0.82	U	
Di-n-octyl phthalate	ug/l	NS or 50*	3	U			3	U			1.5	U			1.5	U	0.69	U	
Diphenyl	ug/l	5	**30**				5.7	U			2.8	U			2.8	U	0.69	U	
Fluoranthene	ug/l	NS or 50*	6.5	U			6.5	U			3.2	U			3.2	U	0.72	U	
Fluorene	ug/l	NS or 50*	35				5.7	U			2.8	U			2.8	U	0.8	U	
Hexachlorobenzene	ug/l	0.4	0.59	U			0.59	U			0.29	U			0.29	U	0.47	U	
Hexachlorobutadiene	ug/l	0.5	1.2	U			1.2	U			0.57	U			0.58	U	0.76	U	
Hexachlorocyclopentadiene	ug/l	0.45	3.4	U			3.4	U			1.7	U *			1.7	U	0.61	U	
Hexachloroethane	ug/l	5	0.51	U			0.51	U			0.25	U			0.25	U	0.09	U	
Indeno[1,2,3-cd]pyrene	ug/l	NS or 0.002*	0.3	U			0.3	U			0.15	U			0.15	U	0.21	U	
Isophorone	ug/l	NS or 50*	5.5	U			5.5	U			2.7	U			2.7	U	0.67	U	
Naphthalene	ug/l	NS or 10*	**320**				**440**				**14**				6.8	J	0.8	U	
Nitrobenzene	ug/l	0.4	0.61	U			0.61	U			0.3	U			0.3	U	0.49	U	
N-Nitrosodi-n-propylamine	ug/l	NS	0.51	U			0.51	U			0.25	U			0.25	U	0.83	U	
N-Nitrosodiphenylamine	ug/l	NS or 50*	5.9	U			5.9	U			2.9	U			2.9	U	0.74	U	
Pentachlorophenol	ug/l	1	11	U			11	U			5.3	U			5.4	U	2.2	U	
Phenanthrene	ug/l	NS or 50*	23				6.3	U			3.1	U			3.1	U	0.65	U	
Phenol	ug/l	1	1.6	U			1.6	U			0.81	U			0.82	U	0.41	U	
Pyrene	ug/l	NS or 50*	5.9	U			5.9	U			2.9	U			2.9	U	0.83	U	
Total Conc	ug/l	NS	574.5				505.62				14				6.8		0		
Total Estimated Conc. (TICs)	uf/l	NS	1698				651				54				22		0.0*T		

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5b
Summary of Groundwater Quality Results - Exterior: VOCs and SVOCs 2012 - 2020
Belle Harbor Shopping Center, Belle Harbor, New York

		Client ID	MW-104D		MW-104D		MW-104D		MW-105S		MW-105S		MW-105S		MW-106S		MW-106S		MW-106S		MW-107S		MW-107S		MW-107S	
		Lab Sample ID	460-41879-2		460-149439-5				460-41785-10						460-41884-1		460-149439-6				460-41785-4					
		Sampling Date	6/29/2012		1/31/2018		8/6/2020		6/27/2012		1/31/2018		8/6/2020		6/27/2012		1/31/2018		8/6/2020		6/26/2012		1/31/2018		8/6/2020	
		Matrix	Water		Water				Water						Water		Water				Water					
		Dilution Factor	1		1				2						1		1				1					
SVOA-8270C-WATER	**Units**	**AWQSGVs**	Result	Q	ug/l				Result	Q					Result	Q	ug/l				Result	Q				
2,4,5-Trichlorophenol	ug/l	NS	2.7	U	0.49	U			5.3	U					2.6	U	0.49	U			2.7	U				
2,4,6-Trichlorophenol	ug/l	NS	2.5	U	0.53	U	Not Sampled		4.8	U	Not Sampled		Not Sampled		2.4	U	0.53	U	Not Sampled		2.4	U	Not Sampled		Not Sampled	
2,4-Dichlorophenol	ug/l	1	2.7	U	0.63	U			5.3	U					2.6	U	0.63	U			2.7	U				
2,4-Dimethylphenol	ug/l	1	3.6	U	0.91	U			6.9	U					3.4	U	0.91	U			3.5	U				
2,4-Dinitrophenol	ug/l	1	5.7	U	2.4	U			11	U					5.5	U *	2.4	U			5.5	U				
2,4-Dinitrotoluene	ug/l	5	0.49	U	1	U			0.95	U					0.47	U	1.0	U			0.48	U				
2,6-Dinitrotoluene	ug/l	5	0.64	U	0.88	U			1.2	U					0.62	U	0.88	U			0.62	U				
2-Chloronaphthalene	ug/l	NS or 10*	2.8	U	0.61	U			5.5	U					2.7	U	0.61	U			2.8	U				
2-Chlorophenol	ug/l	NS	2.3	U	0.74	U			4.4	U					2.2	U	0.74	U			2.2	U				
2-Methylnaphthalene	ug/l	NS	3.2	U	0.88	U			47						3	U	0.88	U			3.1	U				
2-Methylphenol	ug/l	NS	1.9	U	1.3	U			3.6	U					1.8	U	1.3	U			1.8	U				
2-Nitroaniline	ug/l	5	5.2	U	0.65	U			9.9	U					4.9	U	0.65	U			5	U				
2-Nitrophenol	ug/l	NS	2.5	U	0.59	U			4.8	U					2.4	U	0.59	U			2.4	U				
3,3'-Dichlorobenzidine	ug/l	5	5.2	U	1	U			9.9	U					4.9	U	1.0	U			5	U				
3-Nitroaniline	ug/l	5	5.3	U *	0.82	U			10	U					5.1	U	0.82	U			5.1	U				
4,6-Dinitro-2-methylphenol	ug/l	NS	4.9	U	2	U			9.5	U					4.7	U	2.0	U			4.8	U				
4-Bromophenyl phenyl ether	ug/l	NS	2.6	U	1	U			5.1	U					2.5	U	1.0	U			2.6	U				
4-Chloro-3-methylphenol	ug/l	NS	2.6	U	0.76	U			5.1	U					2.5	U	0.76	U			2.6	U				
4-Chloroaniline	ug/l	5	2.1	U	0.73	U			4	U					2	U	0.73	U			2	U				
4-Chlorophenyl phenyl ether	ug/l	NS	2.6	U	0.96	U			5.1	U					2.5	U	0.96	U			2.6	U				
4-Methylphenol	ug/l	NS	1.7	U	0.87	U			3.2	U					1.6	U	0.87	U			1.6	U				
4-Nitroaniline	ug/l	5	6.1	U	0.48	U			12	U					5.9	U *	0.48	U			5.9	U				
4-Nitrophenol	ug/l	NS	7.1	U	4.7	U			14	U					6.8	U	4.7	U			6.8	U				
Acenaphthene	ug/l	20	2.8	U	0.88	U			**21**						**43**		**30**				2.8	U				
Acenaphthylene	ug/l	NS	2.8	U	0.65	U			5.5	U					24		6.7	J			2.8	U				
Acetophenone	ug/l	NS	2.8	U	1	U			5.5	U					2.7	U	1.0	U			2.8	U				
Anthracene	ug/l	NS or 50*	2.9	U	0.57	U			5.7	U					2.8	U	0.57	U			2.9	U				
Atrazine	ug/l	7.5	3.2	U	0.77	U			6.1	U					3	U	0.77	U			3.1	U				
Benzaldehyde	ug/l	NS	2.1	U *	0.86	U			4	U *					2	U *	0.86	U			2	U *				
Benzo[a]anthracene	ug/l	NS or 0.002*	0.28	U	0.55	U			0.55	U					0.27	U	0.55	U			**0.42**	J				
Benzo[a]pyrene	ug/l	ND	0.15	U	0.16	U			0.28	U					0.14	U	0.16	U			0.14	U				
Benzo[b]fluoranthene	ug/l	NS or 0.002*	0.27	U	0.44	U			0.53	U					0.26	U	0.44	U			0.27	U				
Benzo[g,h,i]perylene	ug/l	NS	2.1	U	0.75	U			4	U					2	U	0.75	U			2	U				
Benzo[k]fluoranthene	ug/l	NS or 0.002*	0.27	U	0.18	U			0.53	U					0.26	U	0.18	U			0.27	U				
bis (2-chloroisopropyl) ether	ug/l	NS	2.1	U	0.12	U			4	U					2	U	0.12	U			2	U				
Bis(2-chloroethoxy)methane	ug/l	5	2.7	U	0.69	U			5.3	U					2.6	U	0.69	U			2.7	U				
Bis(2-chloroethyl)ether	ug/l	1	0.29	U	0.69	U			0.57	U					0.28	U	0.69	U			0.29	U				
Bis(2-ethylhexyl) phthalate	ug/l	5	2.1	U	0.72	U			4	U					2	U	0.72	U			2	U				
Butyl benzyl phthalate	ug/l	NS or 50*	2.6	U	0.6	U			5.1	U					2.5	U	0.60	U			2.6	U				
Caprolactam	ug/l	NS	2.6	U	1.1	U			5.1	U					2.5	U	1.1	U			2.6	U				
Carbazole	ug/l	NS	3.4	U	0.85	U			6.5	U					3.2	U	0.85	U			3.3	U				
Chrysene	ug/l	NS or 0.002*	3.3	U	0.67	U			6.3	U					3.1	U	0.67	U			3.2	U				
Dibenz(a,h)anthracene	ug/l	NS	0.095	U	0.09	U			0.18	U					0.091	U	0.090	U			0.092	U				
Dibenzofuran	ug/l	NS	2.9	U	0.85	U			5.7	U					2.8	U	0.85	U			2.9	U				
Diethyl phthalate	ug/l	NS or 50*	3.1	U	1	U			5.9	U					2.9	U	1.0	U			3	U				
Dimethyl phthalate	ug/l	NS or 50*	2.9	U	0.98	U			5.7	U					2.8	U	0.98	U			2.9	U				
Di-n-butyl phthalate	ug/l	50	3.1	U	0.82	U			5.9	U					2.9	U	0.82	U			3	U				
Di-n-octyl phthalate	ug/l	NS or 50*	1.6	U	0.69	U			3	U					1.5	U	0.69	U			1.5	U				
Diphenyl	ug/l	5	2.9	U	0.69	U			5.7	U					2.8	U	0.69	U			2.9	U				
Fluoranthene	ug/l	NS or 50*	3.4	U	0.72	U			6.5	U					3.2	U	0.72	U			3.3	U				
Fluorene	ug/l	NS or 50*	2.9	U	0.8	U			5.7	U					2.8	U	0.80	U			2.9	U				
Hexachlorobenzene	ug/l	0.4	0.31	U	0.47	U			0.59	U					0.29	U	0.47	U			0.3	U				
Hexachlorobutadiene	ug/l	0.5	0.6	U	0.76	U			1.2	U					0.58	U	0.76	U			0.58	U				
Hexachlorocyclopentadiene	ug/l	0.45	1.8	U *	0.61	U			3.4	U					1.7	U	0.61	U			1.7	U				
Hexachloroethane	ug/l	5	0.26	U	0.09	U			0.51	U					0.25	U	0.090	U			0.26	U				
Indeno[1,2,3-cd]pyrene	ug/l	NS or 0.002*	0.16	U	0.21	U			0.3	U					0.15	U	0.21	U			0.15	U				
Isophorone	ug/l	NS or 50*	2.8	U	0.67	U			5.5	U					2.7	U	0.67	U			2.8	U				
Naphthalene	ug/l	NS or 10*	2.8	U	0.8	U			**290**						**18**		0.80	U			2.8	U				
Nitrobenzene	ug/l	0.4	0.32	U	0.49	U			0.61	U					0.3	U	0.49	U			0.31	U				
N-Nitrosodi-n-propylamine	ug/l	NS	0.26	U	0.83	U			0.51	U					0.25	U	0.83	U			0.26	U				
N-Nitrosodiphenylamine	ug/l	NS or 50*	3.1	U	0.74	U			5.9	U					2.9	U	0.74	U			3	U				
Pentachlorophenol	ug/l	1	5.6	U	2.2	U			11	U					5.4	U	2.2	U			5.4	U				
Phenanthrene	ug/l	NS or 50*	3.3	U	0.65	U			6.3	U					3.1	U	0.65	U			3.2	U				
Phenol	ug/l	1	0.85	U	0.41	U			1.6	U					0.82	U	0.41	U			0.83	U				
Pyrene	ug/l	NS or 50*	3.1	U	0.83	U			5.9	U					2.9	U	0.83	U			3	U				
Total Conc	ug/l	NS	0		0				358						85		36.7				0.42					
Total Estimated Conc. (TICs)	uf/l	NS	0.0*T		24.4				273						183.2		22.9									

Notes:
VOCs = volatile organic compounds
ug/L = micrograms per liter or parts per billion (ppb)
NS = No Standard

AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards
* = Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected

Bold = Concentration exceeds Groundwater Quality Standards
Bold = Concentration exceeds Guidance Value

Table 5c
Summary of Groundwater Quality Results: Bioremediaiton Constituents
Belle Harbor Shopping Center, Belle Harbor, New York

	Medium	Groundwater		Groundwater	
	Laboratory ID	460-41879-3		460-41879-4	
	Sample ID	MW-4		MW-4D	
	Sample Date	6/29/2012		6/29/2012	
	Units	ug/L		ug/L	
	AWQSGVs (ug/L)				
GENERAL CHEMISTRY					
Total Organic Carbon	NS	8,400		2,600	
Sulfate	250,000	61,000		30,700	
Nitrate as N	10,000	680		70	J
Nitrite as N	1,000	49	J	12 U	
METABOLIC ACIDS					
Acetic acid	NS	150 U		150 U	
Butyric acid	NS	160 U		160 U	
Formic acid	NS	110 U		110 U	
Lactic acid	NS	1,200		410	J
Propionic acid	NS	170 U		500	J
Pyruvic acid	NS	80 U		80 U	
DISSOLVED GASSES					
Carbon dioxide	NS	7,500		1,400	
Ethane	NS	4.0 U		4.0 U	
Ethene	NS	3.0 U		3.0 U	
CHLORINATED VOCs					
cis-1,2-Dichloroethene	5	**220**		0.23	J
Tetrachloroethene (PCE)	5	**310**		1.2	
trans-1,2-Dichloroethene	5	4.7		0.13 U	
Trichloroethene (TCE)	5	**200**		0.43	J
Vinyl chloride	2	**47**		0.14 U	

Notes:
AWGSGVs = Ambient Water Quality Standard and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Serries (TOGS) Groundwater Standards

NS = No Standard
Bold = Concentration exceeds Groundwater Quality Standards
ug/L = micrograms per liter

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U = Indicates the analyte was analyzed for but not detected.

Table 5d
Summary of Groundwater Quality Results - 1,4-Dioxane and PFAS: August 2020
Belle Harbor Shopping Center
Belle Harbor, New York

		Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
		Laboratory ID	460-215426-2	460-215426-1	460-215426-3	460-215490-2	460-21426-5	460-215490-2
		Sample ID	**MW-2**	**MW-3**	**DUP A (MW-3)**	**MW-4**	**Equip Blank**	**Field Blank**
		Sample Date	08/06/20	08/06/20	08/06/20	08/05/20	08/05/20	08/05/20
1,4-Dioxane (Method 8270 D SIM) **Analyte**	Units	AWQSGVs						
1,4-Dioxane	ug/L	0.35	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
PFAS (Method 537 modified) **Analyte**		AWQSGVs						
1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8.2)	ng/L	NS	2.80 U	2.83 U	2.72 U	2.84 U	2.72 U	2.71 U
1H, 1H, 2H, 2H-Perfluorootanesulfonic acid (6.2)	ng/L	NS	5.30 U	13.7 J	12.9 J	5.39 U	5.15 U	5.13 U
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	NS	23	6.13 J	9.44 J	2.04 J	1.41 U	1.40 U
N-methylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	NS	1.64 U	1.66 U	1.59 U	1.66 U	1.59 U	1.59 U
Perfluorobutanesulfonic acid (PFBS)	ng/L	NS	8.28	5.19	4.57	10.2	0.46 U	0.46 U
Perfluorobutanoic acid (PFBA)	ng/L	NS	68.2	10.1	11.0	20.8	0.94 U	0.93 U
Perfluorodecanesulfonic acid (PFDS	ng/L	NS	0.87 U	3.29	3.03	3.41	0.84 U	0.84 U
Perfluorodecanoic acid (PFDA)	ng/L	NS	5.25	3.21	3.10	1.33 J	0.72 U J	0.72 U
Perfluorododecanoic acid (PFDoA)	ng/L	NS	0.57 U	0.75 J	0.55 U	0.58 U	0.55 U	0.55 U
Perfluroheptanesulfonic acid (PFHpS)	ng/L	NS	0.92 U	0.93 U	0.89 U	0.93 U	0.89 U	0.89 U
Perfluoroheptanoic acid (PFHpA)	ng/L	NS	18.8	10.3	9.17	16.5	0.85 U	0.58 U
Perfluorohexansulfonic acid (PFHxS)	ng/L	NS	4.43	2.60	3.00	2.56	0.75 U	0.75 U
Perfluorohexanoic acid (PFHxA)	ng/L	NS	54.0	23.7	24.5	41.7	0.71 U	0.71 U
Perfluorononanoic acid (PFNA)	ng/L	NS	7.00	4.52	4.78	4.71	0.25 U	0.25 U
Perfluorooctanesulfonamide (PFOSA)	ng/L	NS	9.64 U	9.75 U	9.36 U	9.79 U	9.73 U	9.33 U
Perfluoroocanesulfonic acid (PFOS)	ng/L	2.7	**52.2**	**32.3**	**31.1**	**22.9** B	0.57 U	0.57 U
Perfluorooctanoic acid (PFOA)	ng/L	6.7	**33.4**	**21.3**	**21.7**	**29.2**	0.46 U	0.76 U
Perfluoropentanoic acid (PFPeA)	ng/L	NS	114	30.0	31.5	73.1	0.59 U	0.59 J
Perfluorotetraecanoic acid (PFTeA)	ng/L	NS	0.89 U	0.90 U	0.86 U	0.90 U	0.86 U	0.86 U
Perfluorotridecanoic acid (PFTriA)	ng/L	NS	0.58 U	0.59 U	0.56 U	0.59 U	0.56 U	0.56 U
Perfluoroundecanoic acid (PFUnA)	ng/L	NS	0.75 U	0.87 J	1.08 J	0.76 U	0.73 U	0.73 U
Total PFAS			388.6	168.0	170.9	228.5	0.0	0.59 J

Notes:
AWQSGVs = Ambient Water Quality Standards and Guidance Values from 6 NYCRR Part 703 and NYSDEC Technical and Operational Guidance Series (TOGS) groundwater standards.
PFAS = Per-and Polyfluoroalkyl Substances
ug/L = micrograms per liter or parts per billion (ppb)
ng/L = nanorograms per liter (or parts per trillion)
B = Compound was found in the blank and sample
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
U = Analyzed for but not detected
NS = No Standard
Bold = Concentration exceeds Groundwater Quality Standards

TABLE 6a
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: March 2012
Belle Harbor Shopping Center
Belle Harbor, New York

Sample Location	NYSDOH Standards [1]		Citibank			Ciros Pizza		Sofias Nail Salon		Vacant Unit				Ambient	
Medium	Subsurface Vapors	Indoor Air	Sub-Slab Vapor	Indoor Air		Sub-Slab Vapor	Indoor Air	Indoor Air		Sub-Slab Vapor		Indoor Air		Outdoor Air	
Sample ID			SVP-6	IA-6	IA-7	SVP-11	IA-11	IAQ-1	IAQ-2	SVP-9	SVP-10	IA-9	IA-10	AMB-1	Ambient
Collection Date			03/20/12	03/20/12	03/20/12	03/20/12	03/20/12	03/11/12	03/11/12	03/20/12	03/20/12	03/20/12	03/20/12	03/11/12	03/20/12
Units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Analyte															
1,1,1-Trichloroethane	NS	NS	<0.18	<0.17	<0.18	<0.17	<0.18	<0.64	<0.64	<0.17	2.9	<0.70	<0.88	<0.17	<0.18
1,1,2,2-Tetrachloroethane	NS	NS	<0.23	<0.22	<0.23	<0.22	<0.23	<0.80	<0.80	<0.22	<0.22	<0.88	<1.1	<0.22	<0.22
1,1-Dichloroethane	NS	NS	<0.14	<0.13	<0.14	0.20	< 0.14	<0.47	<0.47	<0.13	0.21	<0.52	<0.66	<0.13	<0.13
1,1-Dichloroethene	NS	NS	<0.067	<0.063	<0.067	0.077	< 0.067	<0.23	<0.23	<0.063	<0.064	<0.26	<0.32	<0.063	<0.064
1,2,4-Trimethylbenzene	NS	NS	<0.84	<0.78	<0.82	1.6	<0.83	<2.9	<2.9	1.6	1.2	<3.2	<4.0	<0.78	<0.79
1,2-Dichloroethane	NS	NS	<0.14	<0.13	<0.14	<0.13	<0.14	<0.47	<0.47	0.29	0.15	<0.52	<0.66	<0.13	<0.13
1,3-Butadiene	NS	NS	<0.38	<0.35	<0.37	<0.35	2.8	<1.3	<1.3	<0.35	<0.36	<1.4	<1.8	<0.35	<0.36
1,4-Dioxane	NS	NS	<0.61	4.4	<0.60	<0.58	<0.61	<2.1	<2.1	<0.58	<0.58	<2.3	<2.9	<0.57	<0.58
2-Butanone (MEK)	NS	NS	<2.5	<2.3	<2.5	4.0	<2.5	<8.6	<8.6	<2.4	<2.4	<9.5	<12	<2.3	<2.4
2-Propanol	NS	NS	40	40	52	4.5	81	<7.2	<7.2	<2.0	<2.0	<7.9	<10	<1.9	<2.0
4-Ethyltoluene	NS	NS	<0.84	<0.78	<0.82	1.4	<0.83	<2.9	<2.9	1.2	0.90	<3.2	<4.0	<0.78	<0.79
Acetone	NS	NS	16	20	19	85	21	230	280	26	16	29	23	4.4	2.9
Benzene	NS	NS	1.0	1.1	0.97	2.6	23	< 0.94	< 0.94	1.4	1.6	1.6	1.5	0.48	0.66
Carbon Disulfide	NS	NS	<2.6	<2.5	<2.6	7.8	<2.6	<9.1	<9.1	2.6	3.8	<10	<13	<2.5	<2.5
Carbon Tetrachloride	NS	NS	<1.1	<0.99	<1.0	<1.0	<1.1	<3.7	<3.7	1.0 J	2.4 J J	<4.0	<5.1	<0.99	<1.0
Chloroform	NS	NS	<0.83	<0.77	<0.82	3.3	1.8	2.9	<2.9	2.1	56	<3.1	<4.0	<0.77	<0.79
Chloromethane	NS	NS	1.1	1.0	0.88	<0.33	1.4	< 1.2	1.2 J	0.94	<0.33	<1.3	<1.7	0.96 J	0.82
cis-1,2-Dichloroethene	NS	NS	<0.13	<0.12	<0.13	<0.13	<0.13	<0.46	<0.46	<0.13	0.21	<0.51	<0.64	<0.12	<0.13
Cyclohexane	NS	NS	0.80	0.65	1.1	5.1	0.62	53	71	0.74	<0.56	< 2.2	<2.8	<0.54	<0.55
Ethanol	NS	NS	980 J	940 J	1100 J	120	3100 J	470 J	440	250 J	180 J	2,100 J	1,800 J	3.4	3.9
Ethyl Benzene	NS	NS	0.24	0.23	0.26	1.4	0.41	<0.51	<0.51	1.0	1.3	<0.56	<0.70	<0.14	0.26
Freon 11	NS	NS	1.6	1.6	1.6	2.2	1.6	< 3.3	< 3.3	9.9	5.9	9.0	9.5	1.1	1.4
Freon 12	NS	NS	4.0	3.9	3.8	200	2.6	< 2.9	< 2.9	4.9	11	5.0	<4.0	2.1	2.7
Heptane	NS	NS	<0.70	1.1	1.5	2.4	3.2	75	85	1.8	0.98	<2.6	<3.3	<0.65	<0.66
Hexane	NS	NS	<0.60	<0.56	<0.59	1.6	1.6	3.3	4.4	0.68	<0.57	<2.3	<2.8	<0.56	<0.57
m,p-Xylene	NS	NS	0.55	0.51	0.54	4.2	0.60	<1.0	<1.0	3.5	3.9	1.1	<1.4	<0.27	0.63
Methylene Chloride	NS	60	<1.2	<1.1	<1.2	3.1 J	<1.2	<4.1	<4.1	<1.1	<1.1	<4.5	<5.6	<1.1	<1.1
o-Xylene	NS	NS	0.21	0.18	0.18	1.6	0.23	<0.51	<0.51	1.4	1.4	<0.56	<0.70	<0.14	0.24
Styrene	NS	NS	<0.72	<0.67	<0.72	<0.68	0.84	<2.5	<2.5	< 0.68	<0.69	<2.7	< 3.4	<0.67	<0.68
Tetrachloroethene (PCE)	NS	30	1.0	1.0	1.1	160	0.45	2.8	3.1	21	48	5.2	5.0	<0.21	<0.22
Toluene	NS	NS	4.0	4.0	4.7	15	4.9	350	320	7.8	8.4	5.8	5.0	0.88	1.2
Trichloroethene (TCE)	NS	2	<0.18	<0.17	<0.18	2.9	<0.18	< 0.63	< 0.63	0.18	3.8	<0.69	<0.87	<0.17	<0.17
Vinyl Chloride	NS	NS	<0.043	<0.040	<0.043	<0.041	<0.043	<0.15	<0.15	<0.041	0.049	<0.16	<0.21	<0.40	<0.041
Total VOCs			1050.5	1019.7	1187.6	630.0	3248.1	1187.0	1204.7	340.0	347.7	2156.7	1844.0	13.3	14.7

Notes:
[1] Standards from Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, NYSDOH October 2006, plus updates
NS = No Standard
ug/m3 = micrograms per cubic meter (aka part per billion)
Only those analytes detected in one or more samples are presented above
Bold = Concentration exceeds Standards
J = Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method
< = Compound analyzed for but not detected above the reporting limit

TABLE 6b
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: March 2014
Belle Harbor Shopping Center
Belle Harbor, New York

Sample Location	NYSDOH Standards [1]		Citibank			Ciros Pizza		Sofias Nail Salon		Vacant Unit/Liquor Warehouse				Ambient
Medium	Subsurface Vapors	Indoor Air	Sub-Slab Vapor	Indoor Air		Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor		Indoor Air		Outdoor Air
Sample ID			SVP-6	IA-6	IA-7	SVP-11	IA-11	SVP-102	IAQ-1	SVP-9	SVP-10	IA-9	IA-10	Ambient
Collection Date			03/25/14	03/25/14	03/25/14	03/25/14	03/25/14	03/25/14	03/25/14	03/25/14	03/25/14	03/25/14	03/25/14	03/25/14
Units	ug/m3	ug/m3	Not Tested	Not Tested	Not Tested	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	Not Tested	ug/m3	ug/m3
Analyte														
1,1,1-Trichloroethane	NS	NS				< 0.34	< 0.35	< 0.17	< 1.7	<0.18	0.93		< 0.18	< 0.16
1,1,2,2-Tetrachloroethane	NS	NS				< 0.43	< 0.44	< 0.21	< 2.2	<0.22	<0.23		< 0.22	< 0.21
1,1-Dichloroethane	NS	NS				< 0.25	< 0.26	< 0.12	< 1.3	<0.13	< 0.14		< 0.13	< 0.12
1,1-Dichloroethene	NS	NS				< 0.12	< 0.13	< 0.061	< 0.62	<0.064	<0.066		< 0.065	< 0.060
1,2,4-Trimethylbenzene	NS	NS				< 1.5	< 1.6	1.4	< 7.7	0.90	1.4		< 0.81	< 0.75
1,2-Dichloroethane	NS	NS				< 0.25	< 0.26	< 0.12	< 1.3	< 0.13	< 0.14		< 0.13	< 0.12
1,3-Butadiene	NS	NS				< 0.69	< 0.72	< 0.34	< 3.5	<0.36	<0.37		< 0.36	< 0.34
1,4-Dioxane	NS	NS				< 1.1	< 1.2	< 0.55	< 5.6	< 0.58	< 0.60		< 0.59	< 0.55
2-Butanone (MEK)	NS	NS				< 4.6	< 4.8	3.0	< 23	4.1	3.6		< 2.4	< 2.2
2-Propanol	NS	NS				5.4	42	18	460	2.9	15		7.6	< 1.9
4-Ethyltoluene	NS	NS				< 1.5	< 1.6	1.2	< 7.7	0.93	1.0		< 0.81	< 0.75
4-Methyl-2-pentanone	NS	NS				< 1.3	< 1.3	< 0.63	< 6.4	< 0.66	3.2		< 0.67	< 0.62
Acetone	NS	NS				27	690 E	650 E	16000 E	26	52		76	21
Benzene	NS	NS				< 0.50	4.4	0.49	< 2.5	1.6	0.59		0.46	0.52
Carbon Disulfide	NS	NS				< 4.8	< 5.0	< 2.4	< 24	5.5	3.0		< 2.6	< 2.4
Carbon Tetrachloride	NS	NS				< 2.0	< 2.0	< 0.97	< 9.9	< 1.0	< 1.0		< 1.0	< 0.96
Chloroform	NS	NS				4.7	< 1.6	2.1	< 7.7	< 0.79	12		< 0.80	< 0.74
Chloromethane	NS	NS				< 3.2	< 3.3	< 1.6	< 16	< 1.7	< 1.7		<1.7	< 1.6
cis-1,2-Dichloroethene	NS	NS				< 0.25	< 0.26	< 0.12	< 1.2	0.14	< 0.13		< 0.13	< 0.12
Cyclohexane	NS	NS				< 1.1	< 1.1	< 0.53	< 5.4	< 0.55	<0.57		< 0.56	< 0.52
Ethanol	NS	NS				61	2500 E	140 E	2100 E	39	180 E		490 E	7.9
Ethyl Benzene	NS	NS				0.49	< 0.28	0.80	< 1.4	0.68	0.98		0.28	< 0.13
Freon 11	NS	NS				< 1.8	< 1.8	1.2	< 8.8	1.1	1.1		0.95	1.1
Freon 12	NS	NS				260	2.7	130	< 7.8	6.1	20		2.0	1.7
Heptane	NS	NS				< 1.3	< 1.3	1.1	< 6.4	0.72	< 0.68		< 0.67	< 0.62
Hexane	NS	NS				< 1.1	< 1.1	< 5.4	< 5.5	< 0.57	0.60		< 0.58	< 0.54
m,p-Xylene	NS	NS				1.6	< 0.56	2.6	< 2.7	2.2	3.3		0.69	0.28
Methylene Chloride	NS	60				< 2.2	< 2.2	< 1.1	< 11	<1.1	8.4		3.1	< 1.0
o-Xylene	NS	NS				0.68 J	< 0.28	0.94 J	< 1.4	0.83 J	1.4 J		0.27 J	< 0.13
Styrene	NS	NS				< 1.3	< 1.4	< 0.66	< 6.7	< 0.68	< 0.71		< 0.70	< 0.65
Tetrachloroethene (PCE)	NS	30				34	0.67	140	< 2.1	8.8	14		0.94	< 0.21
Toluene	NS	NS				2.6	5.8	6.2	11	6.1	5.8		4.9	0.98
trans-1,2-Dichloroethene	NS	NS				< 1.2	< 1.3	< 0.61	< 6.2	0.69	< 0.66		< 0.65	< 0.60
Trichloroethene (TCE)	NS	2				0.56	< 0.35	0.52	< 1.7	2.5	1.0		< 0.18	< 0.16
Vinyl Chloride	NS	NS				< 0.080	< 0.083	< 0.039	< 0.40	<0.041	< 0.043		< 0.042	< 0.039
Total VOCs			0.0	0.0	0.0	398.0	3245.6	1099.6	18571.0	110.8	329.3	0.0	587.2	33.5

Notes:

[1] Standards from Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, NYSDOH October 2006, plus updates
NS = No Standard
ug/m3 = micrograms per cubic meter (aka part per billion)
Only those analytes detected in one or more samples are presented above

Bold = Concentration exceeds Standards
J = Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method
< = Compound analyzed for but not detected above the reporting limit
E = Exceeds instrument calibration range

TABLE 6c
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: Grocery Store Unit: 2015 - 2018
Belle Harbor Shopping Center
Belle Harbor, New York

Sample Location	NYSDOH Standards [1]		Stop & Shop Grocery Store								Ambient Air	
Medium	Subsurface Vapors	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Indoor Air	Outdoor Air	Outdoor Air
Sample ID			SV-101	IA-101	SV-102	IA-102	SV-103	IA-103	SVP-103	IA-103	OA-101	Ambient
Collection Date			04/16/15	04/16/15	04/16/15	04/16/15	04/16/15	04/16/15	01/31/18	01/31/18	04/16/15	01/31/18
Units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Analyte												
1,1,1-Trichloroethane	NS	NS	2 J	< 1.09	< 5.46	< 1.09	< 119	< 1.09	< 1200	< 1.1	< 1.09	< 1.1
1,1,2,2-Tetrachloroethane	NS	NS	< 2.75	< 1.37	< 6.87	< 1.37	< 150	< 1.37	< 1400	< 1.4	< 1.37	< 1.4
1,1,2Trichloro-1,2,2-trifluoroethane (Freon TF)	NS	NS	< 3.07	0.475 J	< 7.66	< 1.53	< 168	0.498 J	< 1600	< 1.5	0.5 J	< 1.5
1,1-Dichloroethane	NS	NS	< 1.62	< 0.809	< 4.05	< 0.809	< 88.6	< 0.809	< 850	< 0.81	< 0.809	< 0.81
1,1-Dichloroethene	NS	NS	< 1.59	< 0.793	< 3.96	< 0.793	< 86.8	< 0.793	< 150	< 0.14	< 0.793	< 0.14
1,2,4-Trimethylbenzene	NS	NS	< 1.97	0.359 J	< 4.92	0.359 J	< 108	0.442 J	< 1000	< 0.98	< 0.983	< 0.98
1,2-Dichloroethane	NS	NS	< 1.62	< 0.809	< 4.05	0.304 J	< 88.6	< 0.809	< 850	< 0.81	< 0.809	< 0.81
1,3-Butadiene	NS	NS	< 0.885	< 0.442	< 2.21	< 0.442	< 48.4	< 0.442	< 470	< 0.44	< 0.442	< 0.44
1,4-Dichlorobenzene	NS	NS	< 2.4	0.265 J	< 6.01	0.703 J	< 132	0.836 J	< 1300	< 1.2	< 1.2	< 1.2
1,4-Dioxane	NS	NS	< 1.44	< 0.724	< 3.6	< 0.721	< 78.9	< 0.721	< 19000	< 18	< 0.721	< 18
2-Butanone (MEK)	NS	NS	1.39 J	2.11	5.01 J J	0.894 J	< 162	0.979 J	< 1600	< 1.5	0.463 J	< 1.5
2-Propanol (Isopropyl Alcohol)	NS	NS	< 2.46	8.31	4.28 J J	7.96	< 135	8.01	< 13000	23	< 1.23	< 12
4-Ethyltoluene	NS	NS	< 1.97	< 0.983	< 4.92	< 0.983	< 108	< 0.983	< 1000	< 0.98	< 0.983	< 0.98
4-Methyl-2-pentanone (MIBK)	NS	NS	< 4.1	< 2.05	2.34 J J	< 2.05	< 225	< 2.05	< 2200	< 2.0	< 2.05	< 2.0
Acetone	NS	NS	< 4.75	< 2.38	50.1	8.81	93.6 J	9.38	< 13000	14	2.38 J	< 12
Benzene	NS	NS	0.569 J	0.351 J	< 3.19	0.361 J	< 70	0.364 J	< 670	0.79	0.335 J	1.2
Carbon Disulfide	NS	NS	1.02 J	0.349 J	< 3.11	0.118 J	< 68.2	< 0.623	< 1600	< 1.6	< 6.23	< 1.6
Carbon Tetrachloride	NS	NS	0.667 J	0.547 J	< 6.29	0.421 J	< 138	0.237 J	< 230	0.49	< 1.26	0.40
Chloroform	NS	NS	10.1	3.01	2.17 J	0.923 J	51.3 J	1.12	< 1000	< 0.98	< 0.977	< 0.98
Chloromethane	NS	NS	0.512 J	1	< 2.07	0.985	< 45.2	1.1	< 1100	1.2	0.869	1.1
cis-1,2-Dichloroethene	NS	NS	< 1.59	< 0.793	< 3.96	< 0.793	< 86.8	< 0.793	< 150	< 0.14	< 0.793	< 0.14
Cyclohexane	NS	NS	< 1.38	< 0.688	1.33 J	< 0.688	< 75.4	< 0.688	< 730	< 0.69	< 0.688	< 0.69
Dichlorodifluoromethane (Freon 12)	NS	NS	418 J	1.72	2170	1.23	68.2 J	1.37	< 2600	2.5	1.48	< 2.5
Ethyl Benzene	NS	NS	< 1.74	< 0.869	< 4.34	0.96	< 95.1	0.369 J	< 920	< 0.87	< 0.869	< 0.87
Heptane	NS	NS	< 1.64	0.582 J	< 4.1	0.422 J	< 89.7	0.508 J	< 860	< 0.82	< 0.82	< 0.82
Hexane	NS	NS	< 1.41	0.342 J	< 3.52	0.398 J	< 77.2	0.3 J	< 740	1.6	< 0.705	1.1
m,p-Xylene	NS	NS	< 3.47	< 1.74	< 8.69	1.14 J	< 190	0.812 J	< 2300	< 2.2	< 1.74	< 2.2
Methylene Chloride	NS	60	< 3.47	2.83	< 8.69	8.62	< 190	1.49 J	< 1800	< 1.7	1.74 J	< 1.7
n-Butane	NS	NS	28.5	60.1	11.3	16.4	45.2 J	18.4	< 1300	16	2.45	7.5
o-Xylene	NS	NS	< 1.74	< 0.869	< 4.34	0.53 J	< 95.1	0.378 J	< 920	< 0.87	< 0.869	< 0.87
Styrene	NS	NS	< 1.7	0.894	< 4.26	0.422 J	< 93.2	0.571 J	< 900	< 0.85	< 0.852	< 0.85
Tert-butyl Alcohol	NS	NS	< 3.03	0.679 J	1.39 J	0.249 J	24.6 J	0.318 J	< 16000	< 15	< 1.52	< 15
Tetrachloroethene (PCE)	NS	30	433	0.515 J	317	0.902 J	115,000	1.57	150,000	1.6	< 1.36	3.7
Toluene	NS	NS	2.25	3.03	5.13	2.17	< 82.5	3.32	< 800	1.5	0.452 J	1.7
trans-1,2-Dichloroethene	NS	NS	< 1.59	< 0.793	< 3.96	< 0.793	< 86.8	< 0.793	< 840	< 0.79	< 0.793	< 0.79
Trichloroethene (TCE)	NS	2	< 2.15	< 1.07	< 5.37	< 1.07	67.2 J	< 1.07	430	< 0.19	< 1.07	< 0.19
Trichlorofluoromethane (Freon 11)	NS	NS	26.7	0.967 J	2.56 J	1.12 J	< 123	0.961 J	< 1200	1.1	1.11 J	< 1.1
Vinyl Chloride	NS	NS	< 1.02	< 0.511	< 2.56	< 0.511	< 56	< 0.511	< 94	< 0.089	< 0.511	< 0.089
Acetaldehyde	NS	NS	< 9.04	< 4.5	< 22.5	< 4.5	120 J	4.5 J	NT	NT	2.52 J	NT
Acrolein	NS	NS	< 2.29	< 1.15	< 5.73	0.351 J	< 126	0.303 J	NT	NT	< 1.15	NT
Ethanol	NS	NS	7.54 J	637	5.92 J	290	133 J	298	NT	NT	10.9	NT
n_Octane (C8)	NS	NS	1.14 J	2.78	2.24 J	0.799 J	< 102	1.21	NT	NT	< 0.934	NT
n-Decane (C10)	NS	NS	13.3	21.1	24.1	7.16	< 127	10.9	NT	NT	< 1.16	NT
n-Dodecane (C12)	NS	NS	871 J	3.25 J	373 J	2.09 J J	213 J	5.95 J	NT	NT	1.39 J	NT
n-Nonane (C9)	NS	NS	2.15	19.7	2.13 J	4.7	< 115	4.99	NT	NT	< 1.05	NT
n-Undecane (C11)	NS	NS	1.61 J	3.05	4.35 J	1.34	< 140	2.99	NT	NT	< 1.28	NT
Pentane	NS	NS	27.7	77.9	8.73	19.2	24.9 J	20.2	NT	NT	1.83	NT
Total VOCs							115841.0	402.4	150430.0	63.8	28.4	16.7

Notes:
Only those analytes detected in one or more samples are presented above
[1] Standards from Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, NYSDOH October 2006, plus updates
ug/m3 = micrograms per cubic meter (aka part per billion)
J = Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method
< = Compound analyzed for but not detected above the reporting limit
Bold = Concentration exceeds Standards

NS = No Standard
NT = Not Tested

TABLE 6d
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: August 2020
Belle Harbor Shopping Center
Belle Harbor, New York

Sample Location	NYSDOH Standards [1]		Citibank	Ciros Pizza	Sofias Nail Salon	Liquor Warehouse	Liquor Warehouse	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Ambient
Medium	Subsurface Vapors	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Sub-Slab Vapor	Sub-Slab Vapor	Indoor Air	Indoor Air	Indoor Air	Outdoor Air
Sample ID			IA-7	IA-11	IAQ-1	SVP-9	IA-9	SVP-103	SVP-203	SVP-204	IA-201	IA-202	IA-203	AMB-1
Collection Date			08/06/20	08/04/20	08/06/20	08/04/20	08/04/20	08/06/20	08/06/20	08/06/20	08/06/20	08/06/20	08/06/20	08/06/20
Units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Analyte														
1,1,1-Trichloroethane	NS	NS	< 1.1	< 1.1	< 1.1	< 11	< 1.1	< 540	< 11	< 11	< 1.1	< 1.1	< 1.1	< 1.1
1,2,4-Trimethylbenzene	NS	NS	1.7	< 0.98	1.4	< 9.8	< 0.98	< 490	< 9.8	< 9.8	1.6	1.7	< 0.98	1.9
1,4-Dichlorobenzene	NS	NS	< 1.2	< 1.4	< 2.6	< 12	< 1.2	< 600	< 12	< 12	< 1.2	< 1.2	< 1.2	< 1.2
1,4-Dioxane	NS	NS	< 18	< 18	< 18	< 180	< 18	< 9000	< 180	< 180	< 18	< 18	< 18	< 18
2,2,4-Trimethylpentane	NS	NS	2.6	< 0.93	4.9	< 9.3	< 0.93	< 470	< 9.3	< 9.3	1.2	1.4	2.0	3.6
2-Butanone (MEK)	NS	NS	2.5	2.5	2.5	< 15	< 1.5	< 740	< 15	< 15	10	2.8	< 1.5	< 1.5
2-Propanol (Isopropyl Alcohol)	NS	NS	57	86	3900 E	< 120	110 E	< 6100	< 120	< 120	84	77	280	< 12
4-Ethyltoluene	NS	NS	< 0.98	< 0.98	< 0.98	< 9.8	< 0.98	< 490	< 9.8	< 9.8	< 0.98	< 0.98	< 0.98	< 0.98
4-Methyl-2-pentanone (MIBK)	NS	NS	< 2.0	< 2.0	< 2.0	< 20	< 2.0	< 1000	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
Acetone	NS	NS	34	140 E	8900 E	< 120	94	< 5900	400	320	38	37	33	< 12
Benzene	NS	NS	0.73	1.2	1.2	< 6.4	< 0.64	< 320	6.6	11	0.74	1.0	0.82	1.2
Carbon Disulfide	NS	NS	< 1.6	< 1.6	< 1.6	< 16	< 1.6	< 780	< 16	< 16	6.5	< 1.6	< 1.6	< 1.6
Carbon Tetrachloride	NS	NS	0.35	0.33	0.44	< 2.2	0.32	< 110	< 2.2	< 2.2	0.36	0.37	0.49	0.35
Chloroform	NS	NS	< 0.98	1.2	2.9	< 9.8	< 0.98	< 490	26	48	1.0	1.6	< 0.98	< 0.98
Chloromethane	NS	NS	< 1.0	1.1	1.2	< 10	1.4	< 520	< 10	< 10	< 1.0	< 1.0	1.2	< 1.0
cis-1,2-Dichloroethene	NS	NS	< 0.20	< 0.26	< 0.20	< 2.0	< 0.20	< 100	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20
Cyclohexane	NS	NS	< 0.69	< 0.69	< 0.69	< 6.9	< 0.69	< 340	< 6.9	< 6.9	< 0.69	1.2	< 0.69	< 0.69
Dichlorodifluoromethane (Freon 12)	NS	NS	4.0	< 2.5	< 2.5	< 25	< 2.5	< 1200	< 25	< 25	< 2.5	< 2.5	< 2.5	< 2.5
Ethyl Benzene	NS	NS	< 0.87	< 0.87	1.7	< 8.7	< 0.87	< 430	< 8.7	< 8.7	< 0.87	1.0	< 0.87	1.5
Heptane	NS	NS	< 0.82	< 0.82	< 0.82	< 8.2	< 0.82	< 410	< 8.2	< 8.2	< 0.82	0.93	0.86	1.1
Hexane	NS	NS	1.5	< 0.70	< 0.70	< 7.0	< 0.70	< 350	< 7.0	< 7.0	0.87	1.2	1.0	1.5
m,p-Xylene	NS	NS	< 2.2	< 2.2	6.3	< 22	< 2.2	< 1100	< 22	< 22	< 2.2	2.6	< 2.2	4.6
Methyl methacrylate	NS	NS	< 2.0	< 2.0	46	< 20	< 2.0	< 1000	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
Methylene Chloride	NS	60	< 1.7	< 1.7	< 1.7	< 17	< 1.7	< 870	< 17	< 17	2.2	7.3	< 1.7	< 1.7
n-Butane	NS	NS	6.2	2.2	6.2	< 12	1.8	< 520	< 12	13	14	11	270	2.4
o-Xylene	NS	NS	< 0.87	< 0.87	2.0	< 8.7	< 0.87	< 430	< 8.7	< 8.7	< 0.87	1.1	< 0.87	1.9
Styrene	NS	NS	< 0.85	< 0.85	< 0.85	< 8.5	< 0.85	< 430	< 8.5	< 8.5	< 0.85	1.0	< 0.85	< 0.85
Tert-butyl Alcohol	NS	NS	< 15	< 15	< 15	< 150	< 10	< 7600	< 150	< 150	< 15	< 15	< 15	< 15
Tetrachloroethene (PCE)	NS	30	< 1.4	< 1.4	< 1.4	< 14	< 1.4	330,000 E	5,600 E	6700 E	< 1.4	< 1.4	2.3	< 1.4
Toluene	NS	NS	2.5	1.2	21	< 7.5	1.0	< 350	44	7.7	4.7	12	2.7	5.9
trans-1,2-Dichloroethene	NS	NS	< 0.79	< 0.79	< 0.79	< 7.9	< 0.65	< 400	< 7.9	< 7.9	< 0.79	< 0.79	< 0.79	< 0.79
Trichloroethene (TCE)	NS	2	< 0.20	< 0.20	< 0.20	< 2.0	< 0.20	940	6.2	6.6	< 0.20	< 0.20	< 0.20	< 0.20
Trichlorofluoromethane (Freon 11)	NS	NS	1.1	< 1.1	1.2	< 11	< 1.1	< 560	< 11	< 11	1.1	< 1.1	< 1.1	< 1.1
Vinyl Chloride	NS	NS	< 0.20	< 0.20	< 0.20	< 2.0	< 0.20	< 100	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20
Naphthalene	NS	NS	< 2.6	< 2.6		< 26	< 2.6	< 1300	< 26	< 26	< 2.6	< 2.6	< 2.6	< 2.6
Total VOCs			114.2	235.7	12,899	0.0	208.5	330,940	6,083	7,106	166.3	162.2	594.4	26.0

Notes:
[1] Standards from Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, NYSDOH October 2006 and Updates
NS = No Standard
ug/m3 = micrograms per cubic meter (aka part per billion)
Only those analytes detected in one or more samples are presented above

Bold = Concentration exceeds Standards
J = Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method
< = Compound analyzed for but not detected above the reporting limit
E = Exceeds instrument calibration range

TABLE 6e
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: March 2022
Belle Harbor Shopping Center
Belle Harbor, New York

Sample Location	NYSDOH Standards [1]		Citibank	Ciros Pizza	Sofias Nail Salon	Liquor Warehouse	Liquor Warehouse	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Ambient
Medium	Subsurface Vapors	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Sub-Slab Vapor	Sub-Slab Vapor	Indoor Air	Indoor Air	Indoor Air	Outdoor Air
Sample ID			IA-7	IA-11	IAQ-1	SVP-9	IA-9	SVP-103	SVP-203	SVP-204	IA-201	IA-202	IA-203	AMB-1
Collection Date			03/31/22	03/31/22	03/31/22	04/01/22	03/31/22	04/01/22	04/01/22	04/01/22	03/31/22	03/31/22	03/31/22	03/31/22
Units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Analyte														
1,1,1-Trichloroethane	NS	NS	< 1.1	< 1.1 UJ	< 1.1 UJ	< 11	< 1.1	< 330 UJ	< 11	< 11	< 1.1	< 1.1	< 1.1	< 1.1
1,1,2,2-Tetrachloroethane	NS	NS	< 1.4	< 1.4 UJ	< 1.4 UJ	< 14	< 1.4	< 410 UJ	< 14	< 14	< 1.4	< 1.4	< 1.4	< 1.4
1,1,2Trichloro-1,2,2-trifluoroethane	NS	NS	< 1.5	< 1.5 UJ	< 1.5 UJ	< 15	< 1.5	< 460 UJ	< 15	< 15	< 1.5	< 1.5	< 1.5	< 1.5
1,1-Dichloroethane	NS	NS	< 0.81	< 0.81 UJ	< 0.81 UJ	< 8.1	< 0.81	< 240 UJ	< 8.1	< 8.1	< 0.81	< 0.81	< 0.81	< 0.81
1,1-Dichloroethene	NS	NS	< 0.20	< 0.20 UJ	< 0.20 UJ	< 2.0	< 0.20	< 60 UJ	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20
1,2,4-Trimethylbenzene	NS	NS	< 0.98	< 0.98 UJ	< 0.98 UJ	< 9.8	< 0.98	< 290 UJ	< 9.8	< 9.8	< 0.98	< 0.98	< 0.98	< 0.98
1,2-Dichloroethane	NS	NS	< 0.81	< 0.81 UJ	< 0.81 UJ	< 8.1	< 0.81	< 240 UJ	< 8.1	< 8.1	< 0.81	< 0.81	< 0.81	< 0.81
1,3-Butadiene	NS	NS	< 0.44	< 0.44 UJ	< 0.44 UJ	< 4.4	< 0.44	< 130 UJ	< 4.4	< 4.4	< 0.44	< 0.44	< 0.44	< 0.44
1,4-Dichlorobenzene	NS	NS	< 1.2	< 1.2 UJ	< 1.2 UJ	< 12	< 1.2	< 360 UJ	< 12	< 12	< 1.2	< 1.2	< 1.2	< 1.2
1,4-Dioxane	NS	NS	< 18	< 18 UJ	< 18 UJ	< 180	< 18	< 5400 UJ	< 180	< 180	< 18	< 18	< 18	< 18
2,2,4-Trimethylpentane	NS	NS	< 0.93	< 0.93 UJ	< 0.93 UJ	< 9.3	< 0.93	< 280 UJ	< 9.3	< 9.3	< 0.93	< 0.93	< 0.93	< 0.93
2-Butanone (MEK)	NS	NS	< 1.5	< 1.5 UJ	2.3 UJ	< 15	< 1.5	< 440 UJ	< 15	< 15	< 1.5	< 1.5	1.8	< 1.5
2-Propanol (Isopropyl Alcohol)	NS	NS	22	280 J	3300 J	< 120	15	< 3700 UJ	< 120	< 120	19	25	21	< 12
4-Ethyltoluene	NS	NS	< 0.98	< 0.98 UJ	< 0.98 UJ	< 9.8	< 0.98	< 290 UJ	< 9.8	< 9.8	< 0.98	< 0.98	< 0.98	< 0.98
4-Methyl-2-pentanone (MIBK)	NS	NS	< 2.0	< 2.0 UJ	< 2.0 UJ	< 20	< 2.0	< 610 UJ	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
Acetone	NS	NS	42	610 J	3700 J	< 120	62	< 3600 UJ	< 120	< 120	22	19	15	< 12
Benzene	NS	NS	< 0.64	2.1 UJ	< 0.64 UJ	< 6.4	< 0.64	< 190 UJ	< 6.4	< 6.4	< 0.64	< 0.64	< 0.64	0.64
Carbon Disulfide	NS	NS	< 1.6	< 1.6 UJ	< 1.6 UJ	< 16	4.6	< 470 UJ	< 16	< 16	< 1.6	< 1.6	< 1.6	< 1.6
Carbon Tetrachloride	NS	NS	0.33	0.32 UJ	0.35 UJ	< 2.2	0.31	< 66 UJ	< 2.2	< 2.2	0.40	0.45	0.37	0.35
Chloroform	NS	NS	< 0.98	1.3 UJ	<0.98 UJ	< 9.8	< 0.98	< 290 UJ	< 9.8	13	< 0.98	< 0.98	< 0.98	< 0.98
Chloromethane	NS	NS	1.3	1.3 UJ	1.3 UJ	< 10	1.3	< 310 UJ	< 10	< 10	1.2	1.2	1.2	1.3
cis-1,2-Dichloroethene	NS	NS	< 0.20	< 0.26 UJ	< 0.20 UJ	< 2.0	< 0.20	< 60 UJ	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20
Cyclohexane	NS	NS	< 0.69	< 0.69 UJ	< 0.69 UJ	< 6.9	< 0.69	< 210 UJ	< 6.9	< 6.9	< 0.69	< 0.69	< 0.69	< 0.69
Dichlorodifluoromethane (Freon 12)	NS	NS	< 2.5	< 2.5 UJ	< 2.5 UJ	< 25	< 2.5	< 740 UJ	< 25	< 25	3.1	< 2.5	< 2.5	< 2.5
Ethanol (Ethyl Alcohol)	NS	NS	< 0.87	< 0.87 UJ	< 0.87 UJ	< 8.7	< 0.87	< 260 UJ	< 8.7	< 8.7	< 0.87	< 0.87	< 0.87	< 0.87
Ethyl Benzene	NS	NS	< 0.87	< 0.87 UJ	< 0.87 UJ	< 8.7	< 0.87	< 260 UJ	< 8.7	< 8.7	< 0.87	< 0.87	< 0.87	< 0.87
Heptane	NS	NS	< 0.82	< 0.82 UJ	< 0.82 UJ	< 8.2	< 0.82	< 250 UJ	< 8.2	< 8.2	< 0.82	< 0.82	< 0.82	< 0.82
Hexane	NS	NS	< 1.8	< 1.8 UJ	2.0 UJ	< 18	<1.8	< 530 UJ	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8
m,p-Xylene	NS	NS	< 2.2	< 2.2 UJ	2.9 UJ	< 22	< 2.2	< 650 UJ	< 22	< 22	< 2.2	< 2.2	< 2.2	< 2.2
Methyl methacrylate	NS	NS	< 2.0	3.5 UJ	110 UJ	< 20	< 2.0	< 610 UJ	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
Methylene Chloride	NS	60	4.1	2.6 UJ	6.5 UJ	< 17	< 1.7	< 520 UJ	< 17	< 17	< 1.7	1.9	4.9	< 1.7
Naphthalene	NS	NS	< 2.6 UJ	< 2.6 UJ	< 2.6 UJ	< 26	< 2.6 UJ	< 790 UJ	< 26	< 26	< 2.6 UJ	< 2.6 UJ	< 2.6 UJ	< 2.6 UJ
n-Butane	NS	NS	4.6	4.8 UJ	13 UJ	< 12	13	< 360 UJ	< 12	< 12	54	15	7.7	< 1.2
o-Xylene	NS	NS	< 0.87	< 0.87 UJ	0.93 UJ	< 8.7	< 0.87	< 260 UJ	< 8.7	< 8.7	< 0.87	< 0.87	< 0.87	< 0.87
Styrene	NS	NS	< 0.85	< 0.85 UJ	< 0.85 UJ	< 8.5	< 0.85	< 260 UJ	< 8.5	< 8.5	< 0.85	< 0.85	< 0.85	< 0.85
Tert-butyl Alcohol	NS	NS	< 15	< 15 UJ	< 15 UJ	< 150	< 15	< 4500 UJ	< 150	< 150	< 15	< 15	< 15	< 15
Tetrachloroethene (PCE)	NS	30	1.6	< 1.4 UJ	< 1.4 UJ	< 14	< 1.4	240,000 J	21	120	3.3	2.7	2.5	2.3
Toluene	NS	NS	2.4	2.8 UJ	17 UJ	< 7.5	< 0.75	< 230 UJ	< 7.5	< 7.5	< 0.75	1.8	2.0	0.86
trans-1,2-Dichloroethene	NS	NS	< 0.79	< 0.79 UJ	< 0.79 UJ	< 7.9	<0.79	< 240 UJ	< 7.9	< 7.9	< 0.79	< 0.79	< 0.79	< 0.79
Trichloroethene (TCE)	NS	2	< 0.20	< 0.20 UJ	< 0.20 UJ	4.6	< 0.20	970 J	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20
Trichlorofluoromethane (Freon 11)	NS	NS	1.1	< 1.1 UJ	< 1.1 UJ	< 11	< 1.1	< 340 UJ	< 11	< 11	1.1	< 1.1	1.1	< 1.1
Vinyl Chloride	NS	NS	< 0.20	< 0.20 UJ	< 0.20 UJ	< 2.0	< 0.20	< 60 UJ	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20
Total VOCs			79.4	908.7	7,156	4.6	96.2	240,970	21	133	104.1	67.1	57.6	5.5

Notes:
[1] Standards from Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, NYSDOH October 2006 and Updates
NS = No Standard
ug/m3 = micrograms per cubic meter (aka part per billion)
Only those analytes detected in one or more samples are presented above
Bold = Concentration exceeds Standards

J = Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method
< = Compound analyzed for but not detected above the reporting limit
E = Exceeds instrument calibration range

Validator Qualifiers
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6f
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: March 2023
Belle Harbor Shopping Center
Belle Harbor, New York

Sample Location	NYSDOH Standards [1]		Citibank	Ciros Pizza	Sofias Nail Salon	Liquor Warehouse	Liquor Warehouse	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Ambient
Medium	Subsurface Vapors	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Sub-Slab Vapor	Sub-Slab Vapor	Indoor Air	Indoor Air	Indoor Air	Outdoor Air
Sample ID			IA-7	IA-11	IAQ-1	SVP-9	IA-9	SVP-103 *	SVP-203	SVP-204	IA-201	IA-202	IA-203	AMB-1
Collection Date			03/30/23	03/30/23	03/30/23	03/30/23	03/30/23	03/30/23	03/30/23	04/01/22	03/30/23	03/30/23	03/30/23	03/30/23
Units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Analyte														
1,1,1-Trichloroethane	NS	NS	< 0.109	< 0.109	< 0.109	< 0.109	< 0.109	< 1090	< 0.109	< 0.109	< 1.09	< 1.09	< 1.09	< 1.09
1,1,2,2-Tetrachloroethane	NS	NS	< 1.37	< 1.37	< 1.37	< 1.37	< 1.37	< 1370	< 1.37	< 1.37	< 1.37	< 1.37	< 1.37	< 1.37
1,1-Dichloroethane	NS	NS	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 809	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809
1,1-Dichloroethene	NS	NS	< 0.079	< 0.079	< 0.079	< 0.793	< 0.079	< 793	< 0.793	< 0.793	< 0.079	< 0.079	< 0.079	< 0.079
1,2,4-Trimethylbenzene	NS	NS	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 983	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983
1,2-Dichloroethane	NS	NS	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 809	< 0.809	< 0.809	< 0.81	< 0.81	< 0.81	< 0.81
1,3-Butadiene	NS	NS	< 0.442	< 0.442	< 0.442	< 0.442	< 0.442	< 442	< 0.442	< 0.442	< 0.442	< 0.442	< 0.442	< 0.442
1,4-Dichlorobenzene	NS	NS	< 1.20	< 1.20	2.07	< 1.20	< 1.20	< 1200	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20
1,4-Dioxane	NS	NS	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 721	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721
2,2,4-Trimethylpentane	NS	NS	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 934	< 0.934	< 0.934	< 0.934	6.40 J	< 0.934	< 0.934
2-Butanone (MEK)	NS	NS	< 1.47	< 1.47	6.81	1.62	< 1.47	< 1470	49.0	< 1.47	< 1.47	< 1.47	< 1.47	< 1.47
2-Propanol (Isopropyl Alcohol)	NS	NS	10.2	619 E-J	4,990 E-J	< 1.23	15.6	< 1230	10.7	1.71	15.6	23.3	32.0	1.97
4-Ethyltoluene	NS	NS	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 983	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983
4-Methyl-2-pentanone (MIBK)	NS	NS	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2050	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05
Acetone	NS	NS	15.7	2760 E-J	11,400 E-J	5.82	94.1	< 2380	518	12.1	115	95.5	55.8	20.0
Benzene	NS	NS	< 0.639	< 0.639	0.786	< 0.639	< 0.639	< 639	< 0.639	< 0.639	< 0.639	< 0.639	< 0.639	0.735 J
Carbon Disulfide	NS	NS	< 0.623	< 0.623	< 0.623	< 0.623	< 0.623	< 623	< 0.623	< 0.623	< 0.623	< 0.623	< 0.623	< 0.623
Carbon Tetrachloride	NS	NS	0.648 J	0.604	0.522	< 1.26	0.623 J	< 1260	< 1.26	< 1.26	0.629 J	0.736	0.679 J	0.660
Chloroethane	NS	NS	< 0.528	< 0.528	< 0.528	< 0.528	< 0.528	< 528	0.723	< 0.528	< 0.528	< 0.528	< 0.528	< 0.528
Chloroform	NS	NS	< 0.977	2.61	9.67	< 0.977	< 0.977	< 977	9.28	14.1	< 0.977	1.02	< 0.977	< 0.977
Chloromethane	NS	NS	1.09	1.11	1.63	< 0.413	1.04	< 413	< 0.413	< 0.413	1.09	1.16	1.09	0.999
cis-1,2-Dichloroethene	NS	NS	< 0.079	< 0.079	< 0.079	< 0.793	< 0.079	< 793	< 0.793	< 0.793	< 0.079	< 0.079	< 0.079	< 0.079
Cyclohexane	NS	NS	< 0.688	3.18	3.99	< 0.688	5.54	< 688	< 0.688	< 0.688	6.92	5.89	3.26	< 0.688
Dichlorodifluoromethane (Freon 12)	NS	NS	3.77	2.84	2.72	5.88	2.53	< 989	2.54	2.65	2.71	2.80	2.68	2.51
Ethanol (Ethyl Alcohol)	NS	NS	411	369	2,410 E-J	< 9.42	224	< 9420	273	< 9.42	269	298	241	9.70
Ethyl Acetate	NS	NS	< 1.80	139	2,100 E-J	< 1.80	2.53	< 1800	< 1.80	< 1.80	2.71	3.02	2.43	< 1.80
Ethyl Benzene	NS	NS	< 0.869	< 0.869	< 0.869	< 0.869	< 0.869	< 869	< 0.869	< 0.869	2.61	1.93	1.06	< 0.869
Heptane	NS	NS	< 0.820	< 0.820	< 0.820	< 0.820	< 0.820	< 820	< 0.820	< 0.820	< 0.820	< 0.820	< 0.820	< 0.820
Hexane	NS	NS	< 0.705	< 0.705	< 0.705	< 0.705	< 0.705	< 705	< 0.705	< 0.705	< 0.705	< 0.705	< 0.705	< 0.705
Methylene Chloride	NS	60	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1740	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74
m,p-Xylene	NS	NS	< 1.74	< 1.74	2.92	< 1.74	< 1.74	< 1740	< 1.74	< 1.74	11.3	7.73	4.23	< 1.74
o-Xylene	NS	NS	< 0.869	< 0.869	< 0.869	< 0.869	< 0.869	< 869	< 0.869	< 0.869	2.76	2.01	1.13	< 0.869
Styrene	NS	NS	< 0.852	< 0.852	< 0.852	< 0.852	< 0.852	< 852	< 0.852	< 0.852	< 0.852	< 0.852	< 0.852	< 0.852
Tert-butyl Alcohol	NS	NS	< 1.52	< 1.52	5.67 E-J	< 1.52	< 1.52	< 1520	< 1.52	< 1.52	< 1.52	< 1.52	< 1.52	< 1.52
Tetrachloroethene (PCE)	NS	30	0.149 J	0.203	0.156 E-J	10.9	0.142 J	333,000	16.9	190	1.34 J	1.23	1.34 J	22.9
Tetrahydrofuran	NS	NS	< 1.47	< 1.47	< 1.47	< 1.47	< 1.47	< 1470	1.48 J	< 1.47	< 1.47	< 1.47	< 1.47	< 1.47
Toluene	NS	NS	< 0.754	1.69	21.5	< 0.754	< 0.754	< 754	< 0.754	< 0.754	10.3	9.23	5.05	1.27
trans-1,2-Dichloroethene	NS	NS	< 0.793	< 0.793	< 0.793	< 0.793	< 0.793	< 793	< 0.793	< 0.793	< 0.793	< 0.793	< 0.793	< 0.793
Trichloroethene (TCE)	NS	2	< 0.107	< 0.107	< 0.107	< 1.07	< 0.107	1,080	< 1.07	< 1.07	< 0.107	< 0.107	< 0.107	< 0.107
Trichlorofluoromethane (Freon 11)	NS	NS	1.40	1.33	1.40	1.37	1.28	< 1120	1.25	1.39	1.32	1.38	1.34	1.31
Vinyl Chloride	NS	NS	< 0.051	< 0.051	< 0.051	< 0.511	< 0.051	< 511	< 0.511	< 0.511	< 0.051	< 0.051	< 0.051	< 0.051
Total VOCs			444.0	3900.6	20,960	25.6	347.4	334,080	883	222	443.3	461.3	353.1	62.1

Notes:
[1] Standards from Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, NYSDOH October 2006 and Updates
NS = No Standard
ug/m3 = micrograms per cubic meter (aka part per billion)
Only those analytes detected in one or more samples are presented above
Bold = Concentration exceeds Standards

Laboratory Qualifiers
< = Concentration less than noted reporting limits
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

Validator Qualifiers
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
* Sample SVP-103 diluted by factor of 1000.

TABLE 6g
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: March 2024
Belle Harbor Shopping Center
Belle Harbor, New York

Sample Location	NYSDOH Standards [1]		Citibank	Ciros Pizza	Sofias Nail Salon	Liquor Warehouse	Liquor Warehouse	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Stop & Shop	Ambient
Medium	Subsurface Vapors	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Sub-Slab Vapor	Indoor Air	Sub-Slab Vapor	Sub-Slab Vapor	Sub-Slab Vapor	Indoor Air	Indoor Air	Indoor Air	Outdoor Air
Sample ID			IA-7	IA-11	IAQ-1 *	SVP-9	IA-9	SVP-103 **	SVP-203	SVP-204	IA-201	IA-202	IA-203	AMB-1
Collection Date			03/12/24	03/12/24	03/12/24	03/13/24	03/12/24	03/13/24	03/13/24	03/13/24	03/12/24	03/12/24	03/12/24	03/12/24
Units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Analyte														
1,1,1-Trichloroethane	NS	NS	< 0.109	< 0.109	< 0.109	< 0.109	< 0.109	< 1430	< 0.109	< 0.109	< 1.09	< 1.09	< 1.09	< 1.09
1,1,2,2-Tetrachloroethane	NS	NS	< 1.37	< 1.37	< 1.37	< 1.37	< 1.37	< 1810	< 1.37	< 1.37	< 1.37	< 1.37	< 1.37	< 1.37
1,1-Dichloroethane	NS	NS	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 1060	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809
1,1-Dichloroethene	NS	NS	< 0.079	< 0.079	< 0.079	< 0.793	< 0.079	< 1040	< 0.793	< 0.793	< 0.079	< 0.079	< 0.079	< 0.079
1,2,4-Trimethylbenzene	NS	NS	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 1290	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983
1,2-Dichloroethane	NS	NS	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 1060	< 0.809	< 0.809	< 0.81	< 0.81	< 0.81	< 0.81
1,3-Butadiene	NS	NS	< 0.442	< 0.442	< 0.442	< 0.442	< 0.442	< 582	< 0.442	< 0.442	< 0.442	< 0.442	< 0.442	< 0.442
1,4-Dichlorobenzene	NS	NS	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1580	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20
1,4-Dioxane	NS	NS	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 948	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721
2,2,4-Trimethylpentane	NS	NS	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 1230	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	0.986
2-Butanone (MEK)	NS	NS	< 1.47	< 1.47	< 1.47	19.3	< 1.47	< 1940	19.4	12.9	< 1.47	< 1.47	< 1.47	< 1.47
2-Hexanone	NS	NS	< 0.82	< 0.82	< 0.82	4.00	< 0.82	< 1760	< 0.82	2.25	< 0.82	< 0.82	< 0.82	< 0.82
2-Propanol (Isopropanol)	NS	NS	24.8	49.7	2,510 J	< 1.23	26.1	< 1620	1.58	< 1.23	16.1	17.4	19.7	2.35
4-Ethyltoluene	NS	NS	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 1290	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983	< 0.983
4-Methyl-2-pentanone (MIBK)	NS	NS	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2700	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05
Acetone	NS	NS	56.1	831	13,100 J	67.7	546	< 3140	67.9	37.3	80.3	81.0	57.2	29.9
Benzene	NS	NS	0.725	0.821	0.949	< 0.639	0.719	< 840	0.815	< 0.639	0.716	0.712	0.664	0.895
Bromodichloromethane	NS	NS	< 1.34	< 1.34	< 1.34	< 1.34	< 1.34	< 1760	6.77	2.27	< 1.34	< 1.34	< 1.34	< 1.34
Carbon Disulfide	NS	NS	< 0.623	< 0.623	< 0.623	0.670	< 0.623	< 819	26.5	5.92	< 0.623	< 0.623	< 0.623	< 0.623
Carbon Tetrachloride	NS	NS	0.554	0.560	0.591	< 1.26	0.566	< 1650	< 1.26	< 1.26	0.654	0.610 J	0.598	0.547
Chloroethane	NS	NS	< 0.528	< 0.528	< 0.528	< 0.528	< 0.528	< 694	3.51	< 0.528	< 0.528	< 0.528	< 0.528	< 0.528
Chloroform	NS	NS	< 0.977	< 0.977	6.45	< 0.977	< 0.977	< 1280	73.3	46.2	< 0.977	< 0.977	< 0.977	< 0.977
Chloromethane	NS	NS	1.35	1.33	1.50	0.463	1.25	< 543	< 0.413	< 0.413	1.37	1.35	1.33	1.25
cis-1,2-Dichloroethene	NS	NS	< 0.079	< 0.079	< 0.079	< 0.793	< 0.079	< 1040	1.14	< 0.793	< 0.079	< 0.079	< 0.079	< 0.079
Cyclohexane	NS	NS	< 0.688	< 0.688	< 0.688	< 0.688	< 0.688	< 905	< 0.688	< 0.688	< 0.688	< 0.688	< 0.688	< 0.688
Dichlorodifluoromethane (Freon 12)	NS	NS	3.12 J	2.51 J	2.45	2.55	2.38 J	< 1300	2.32	2.62	2.79 J	2.57 J	2.61 J	2.44 J
Ethanol (Ethyl Alcohol)	NS	NS	456 J	528 J	4,370 J	< 9.42	279 J	< 12400	16.6	< 9.42	266 J	268 J	251 J	12.8 J
Ethyl Acetate	NS	NS	< 1.80	15.1	1,160 J	< 1.80	10.2	< 2370	< 1.80	< 1.80	2.54	2.80	2.63	< 1.80
Ethyl Benzene	NS	NS	< 0.869	< 0.869	1.13	< 0.869	< 0.869	< 1140	< 0.869	< 0.869	< 0.869	< 0.869	< 0.869	< 0.869
Heptane	NS	NS	< 0.820	< 0.820	< 0.820	< 0.820	< 0.820	< 1080	< 0.820	< 0.820	< 0.820	< 0.820	< 0.820	0.897
Hexane	NS	NS	< 0.705	< 0.705	< 0.705	< 0.705	< 0.705	< 927	< 0.705	< 0.705	0.715	< 0.705	1.22	1.41
m,p-Xylene	NS	NS	< 1.74	< 1.74	5.21	< 1.74	< 1.74	< 2280	2.38	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74
Methylene Chloride	NS	60	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 2290	< 1.74	< 1.74	< 1.74	< 1.74	24.0	< 1.74
Naphthalene	NS	NS	< 1.05	< 1.05	< 1.05		< 1.05	< 1380	< 1.05	2.25	< 1.05	< 1.05	< 1.05	< 1.05
o-Xylene	NS	NS	< 0.869	< 0.869	0.916	< 0.869	< 0.869	< 1140	< 0.869	< 0.869	< 0.869	< 0.869	< 0.869	< 0.869
Styrene	NS	NS	< 0.852	< 0.852	< 0.852	< 0.852	< 0.852	< 1120	< 0.852	< 0.852	< 0.852	< 0.852	< 0.852	< 0.852
Tert-butyl Alcohol	NS	NS	< 1.52	< 1.52	7.15	2.80	< 1.52	< 1990	8.58	4.15	< 1.52	< 1.52	< 1.52	< 1.52
Tetrachloroethene (PCE)	NS	30	0.888	0.468	0.705	4.86	0.481	511,000	19.5	354	2.05	2.00	1.54	2.75
Tetrahydrofuran	NS	NS	< 1.47	< 1.47	< 1.47	< 1.47	< 1.47	< 1940	< 1.47	< 1.47	< 1.47	< 1.47	< 1.47	< 1.47
Toluene	NS	NS	0.935	0.923	26.9	1.10	1.12	< 991	1.45	< 0.754	1.36	1.43	1.33	1.57
trans-1,2-Dichloroethene	NS	NS	< 0.793	< 0.793	< 0.793	< 0.793	< 0.793	< 1040	< 0.793	< 0.793	< 0.793	< 0.793	< 0.793	< 0.793
Trichloroethene (TCE)	NS	2	0.656	< 0.107	< 0.107	< 1.07	< 0.107	1,610	2.88	< 1.07	< 0.107	< 0.107	< 0.107	< 0.107
Trichlorofluoromethane (Freon 11)	NS	NS	1.49	1.51	< 1.12	< 1.05	1.43	< 1480	1.15	<1.12	1.48	1.48	1.51	1.46
Vinyl Chloride	NS	NS	< 0.051	< 0.051	< 0.051	< 0.511	< 0.051	< 672	< 0.511	< 0.511	< 0.051	< 0.051	< 0.051	< 0.051
Total VOCs			546.6	1431.9	21,194	103.4	869.2	512,610	256	470	376.1	379.4	365.3	59.3

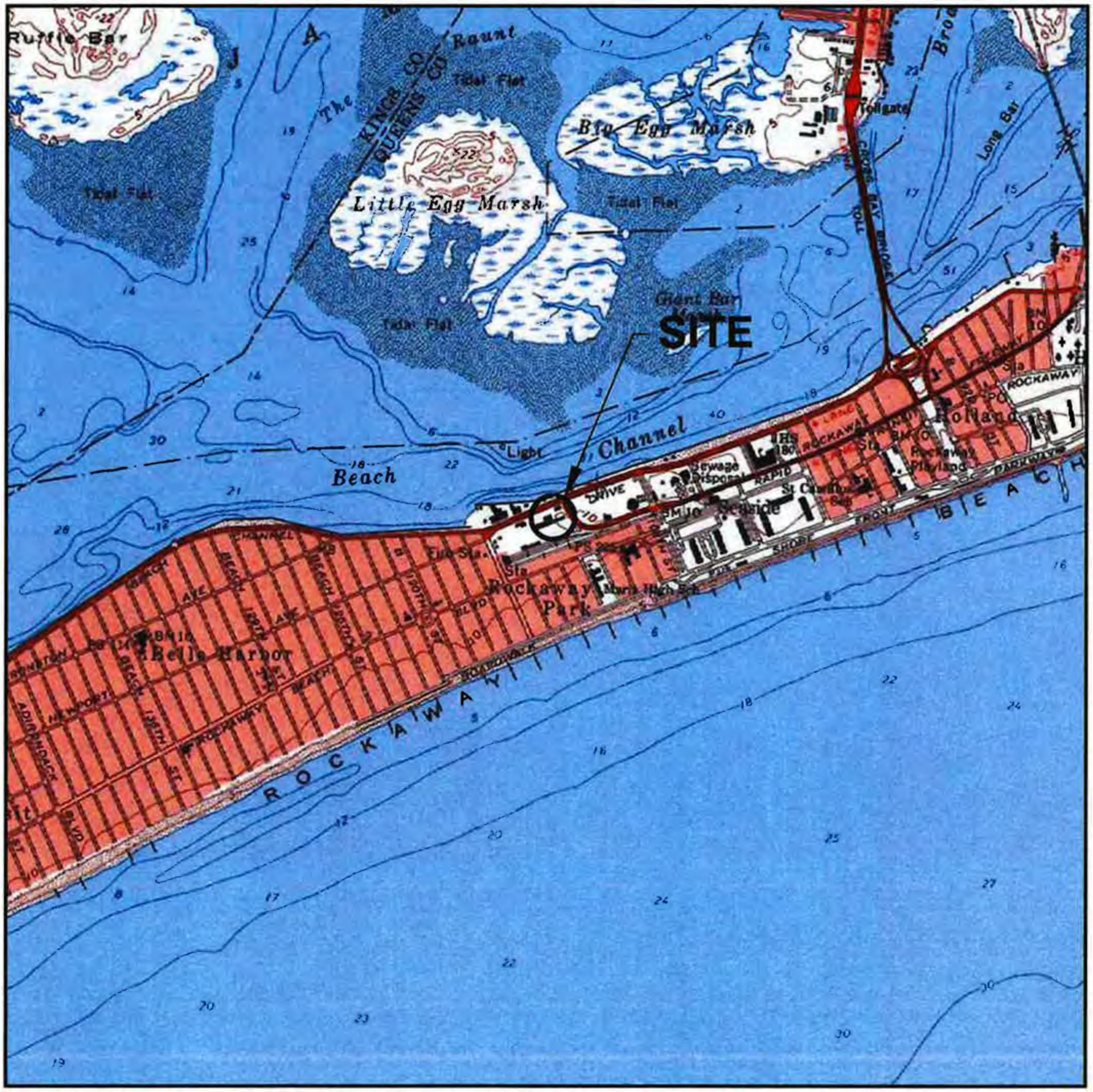
Notes:
[1] Standards from Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, NYSDOH October 2006 and Updates
NS = No Standard
ug/m3 = micrograms per cubic meter (aka part per billion)
Only those analytes detected in one or more samples are presented above
Bold = Concentration exceeds Standards

Laboratory Qualifiers
< = Concentration less than noted reporting limits

Validator Qualifiers
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

* Sample IAQ-1 diluted by factor of 130 ** Sample SVP-103 diluted by factor of 1300

FIGURES



MAP SOURCE:

DeLORME 3D TOPOQUADS

USGS FAR ROCKAWAY [NY] QUAD
1992
40.34.923'N, 73.34.923'W (NAD83/WGS84)

NORTH

NEW YORK

2000 0 2000
Scale in feet

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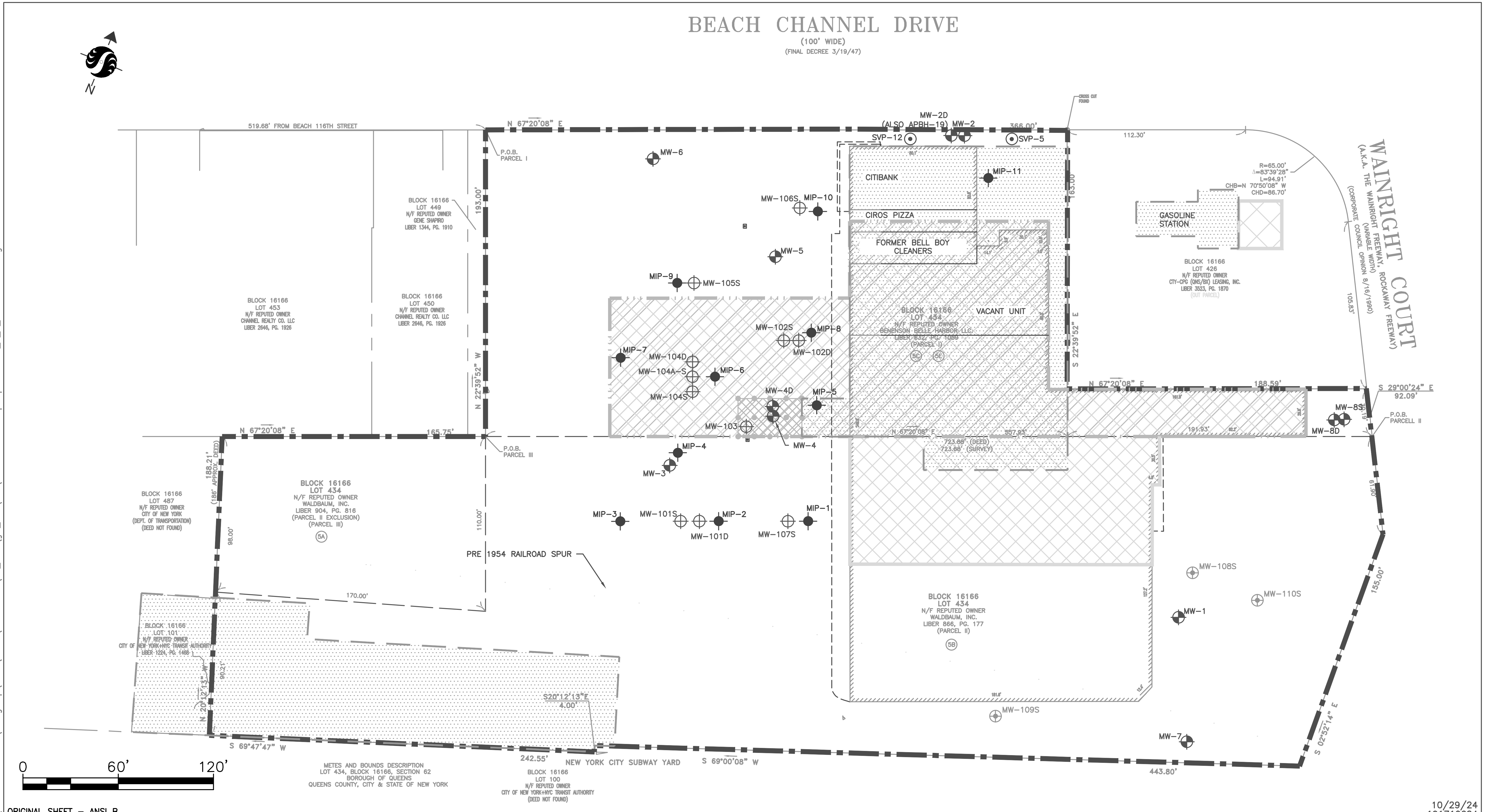
STANTEC OFFICE LOCATION					DRAWING TITLE:
AUBURN, NEW HAMPSHIRE					SITE LOCATION
DATE PREPARED: 8-02-12	DESIGNED BY: JJW	DRAWN BY: JJW	CHECKED BY: DFM	REVIEWED BY: DFM	BELLE HARBOR SHOPPING CENTER 112-15 BEACH CHANNEL DRIVE BELLE HARBOR, NY
REVISION DATE:	REVISION NO:	DRAWN BY:	CHECKED BY:	REVIEWED BY:	
PROJECT NAME/FILE NAME: BELLE HARBOR RI_RA		PROJECT NUMBER/PHASE: 191710624		SCALE: 1:24000	PREPARED FOR: STOP & SHOP — FIGURE NO. 1



\\US0287-PPFSS01\workgroup\1917\active\191711713\03_data\gis_cad\cad\Belle harbor sample plan FIG 2_3_7_8 10-29-24.dwg

ORIGINAL SHEET – ANSI B

10/29/24
191710624

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Legend

- MW-3 MONITOR WELL (INSTALLED BY WHITESTONE)
- MW-101 MONITORING WELL (INSTALLED BY STANTEC)
- MIP GEOPROBE®
- SV-5 SOIL VAPOR PROBE
- MW-108S MONITORING WELL (INSTALLED BY GEI)
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY
- HYDROGEN RELEASE COMPOUND (HRC) INJECTION AREA/POINT – 2008

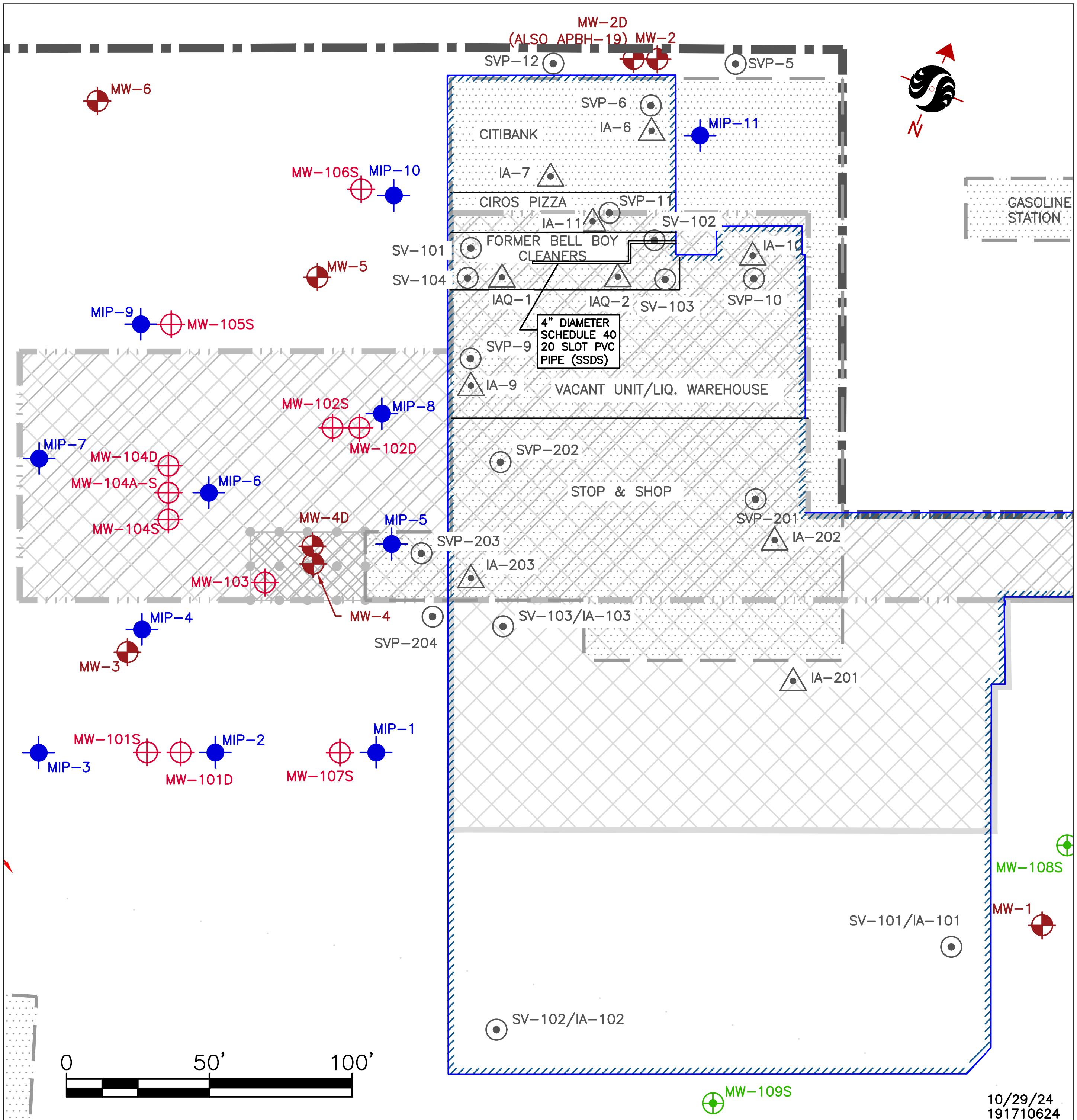
Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC.

Client/Project
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
2

Title
SITE MAP WITH
SAMPLE LOCATIONS-EXTERIOR



\\US0287-PPFSS01\workgroup\1917\active\191711713\03_data\gis_cad\cad\Belle harbor sample plan FIG 2_3_7_8 1_31_14_102824CAC.dwg

ORIGINAL SHEET - ANSI A

LEGEND

MW-3 MONITORING WELL (INSTALLED BY WHITESTONE)

MW-101 MONITORING WELL (INSTALLED BY STANTEC)

MW-109S MONITORING WELL (INSTALLED BY GEI)

MIP GEOPROBE®

SVP-5 SOIL VAPOR PROBE LOCATION

IA-6 INDOOR AIR SAMPLE LOCATION

PRE CIRCA 1954

PRE CIRCA 1966

PRE CIRCA 1980

BCP BOUNDARY

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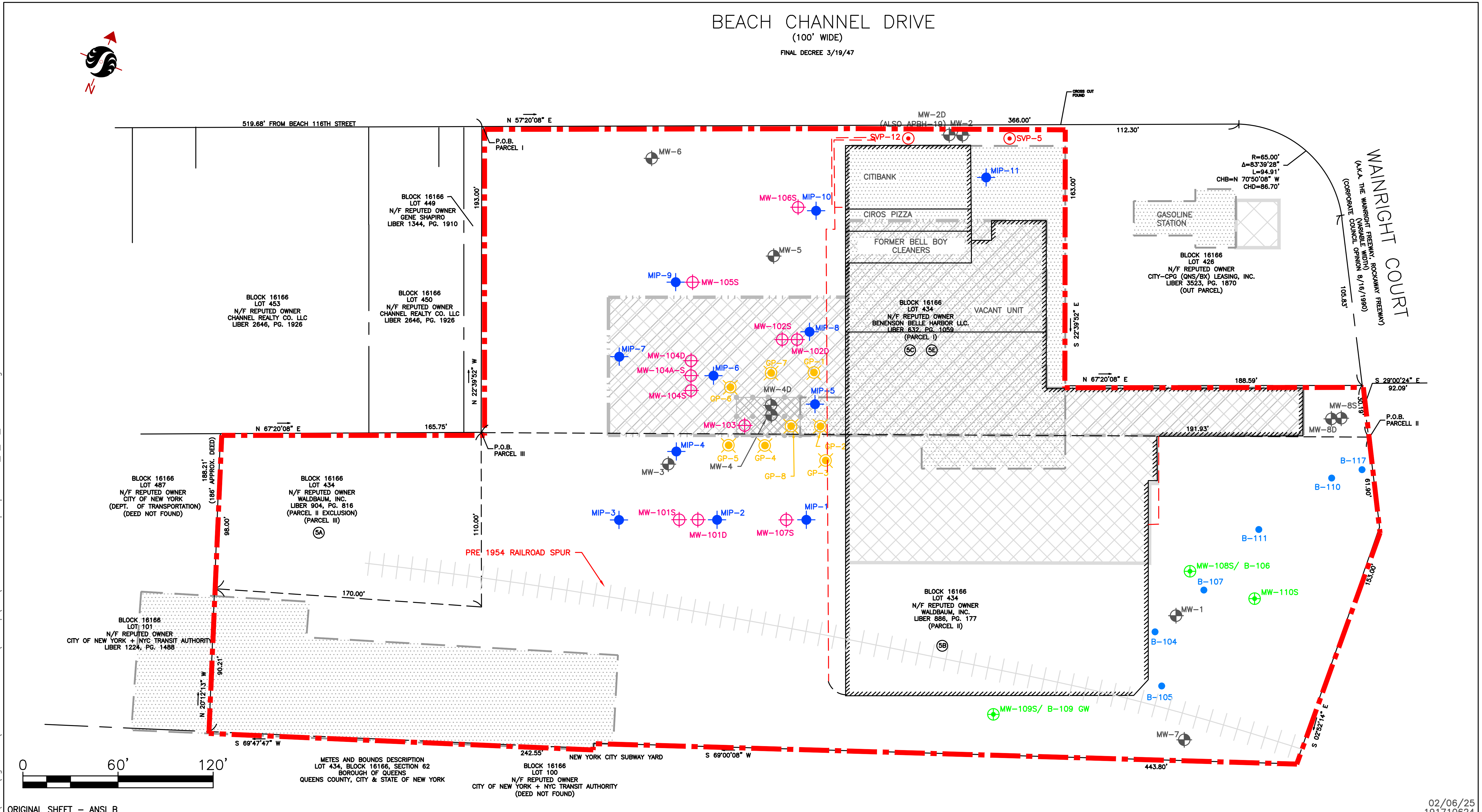
112-15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.

2A

Title

INTERIOR VAPOR INVESTIGATION SAMPLE LOCATIONS



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Legend

MW-3	MONITOR WELL (INSTALLED BY WHITESTONE)	B-107	SOIL BORING (INSTALLED BY GEI)
MW-101	MONITORING WELL (INSTALLED BY STANTEC)	GP-4	SOIL BORING (INSTALLED BY STANTEC)
	MIP GEOPROBE		PRE CIRCA 1954
SV-5	SOIL VAPOR PROBE		PRE CIRCA 1966
MW-108S	MONITORING WELL (INSTALLED BY GEI)		PRE CIRCA 1980
			SITE/BCP BOUNDARY
			HYDROGEN RELEASE COMPOUND (HRC) INJECTION AREA/POINT – 2008

Notes

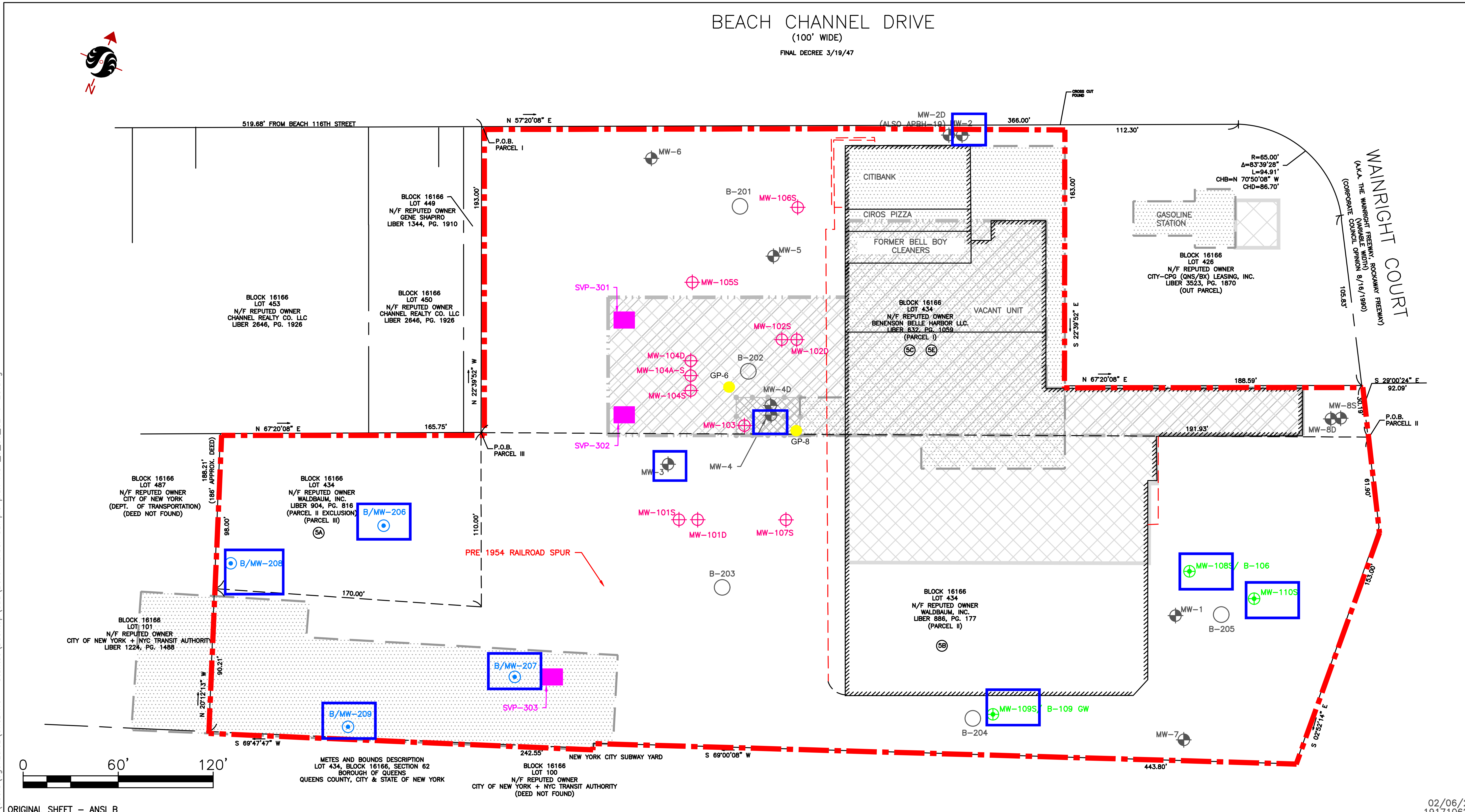
SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC. SEPTEMBER 2012

Client/Project
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
3

Title
SITE MAP WITH HISTORICAL SAMPLE LOCATIONS

C:\Users\egonzalez\OneDrive – Stantec\Desktop\cad\Belle harbor sample plan FIG _3_3a_02-6-25.dwg



C:\Users\egonzalez\OneDrive – Stantec\Desktop\cad\Belle harbor sample plan FIG _3_3a_02-6-25.dwg

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Legend

- MW-3 — MONITOR WELL (INSTALLED BY WHITESTONE)
- MW-101 — MONITORING WELL (INSTALLED BY STANTEC)
- MW-108S — MONITORING WELL (INSTALLED BY GEI)
- B-204 — PROPOSED SOIL BORING LOCATION
- SVP-301 — PROPOSED SOIL VAPOR PROBE LOCATION
- B/MW-206 — PROPOSED SOIL BORING, CONVERTED TO MONITOR WELL LOCATION
- MW-4 — WELL SAMPLED FOR FULL SUITE OF WQ PARAMETERS
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY
- HYDROGEN RELEASE COMPOUND (HRC) INJECTION AREA/POINT – 2008

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC. SEPTEMBER 2012

Client/Project

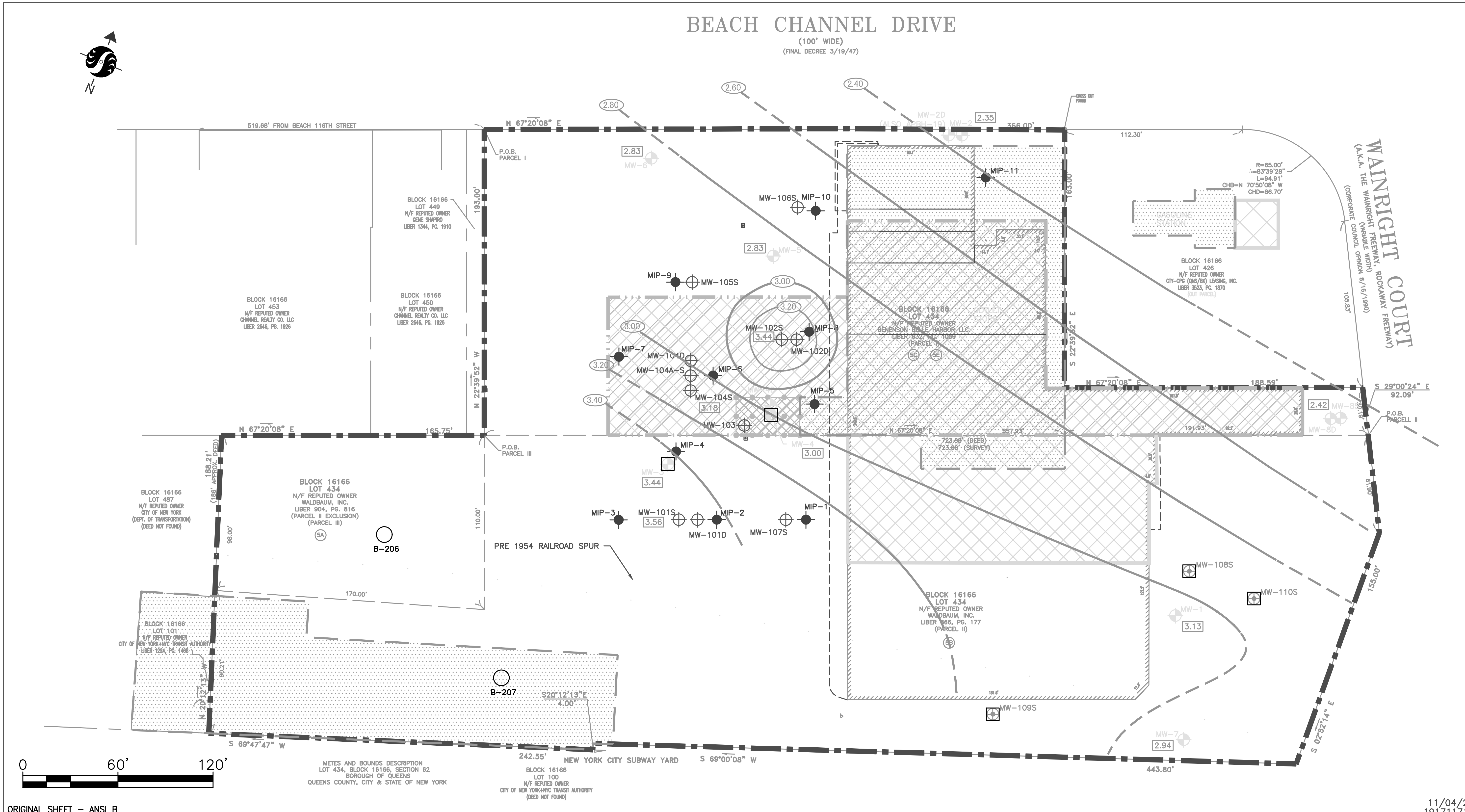
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.

3A

Title

SITE MAP WITH PROPOSED SAMPLE LOCATIONS



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Legend

- MW-3 – MONITOR WELL (INSTALLED BY WHITESTONE)
- MW-101 – MONITORING WELL (INSTALLED BY STANTEC)
- – MIP GEOPROBE
- MW-108S – MONITORING WELL (INSTALLED BY GEI)
- 2.42 – MEASURED WATER TABLE ELEVATION (BASED ON WELL GAUGING DATA COLLECTED ON 6/26/12)
- NM – NOT MEASURED
- 2.40 – GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY
- WELL SAMPLED FOR FULL SUITE OF WATER QUALITY PARAMETERS
- B-206 PROPOSED SOIL BORING LOCATION

Notes

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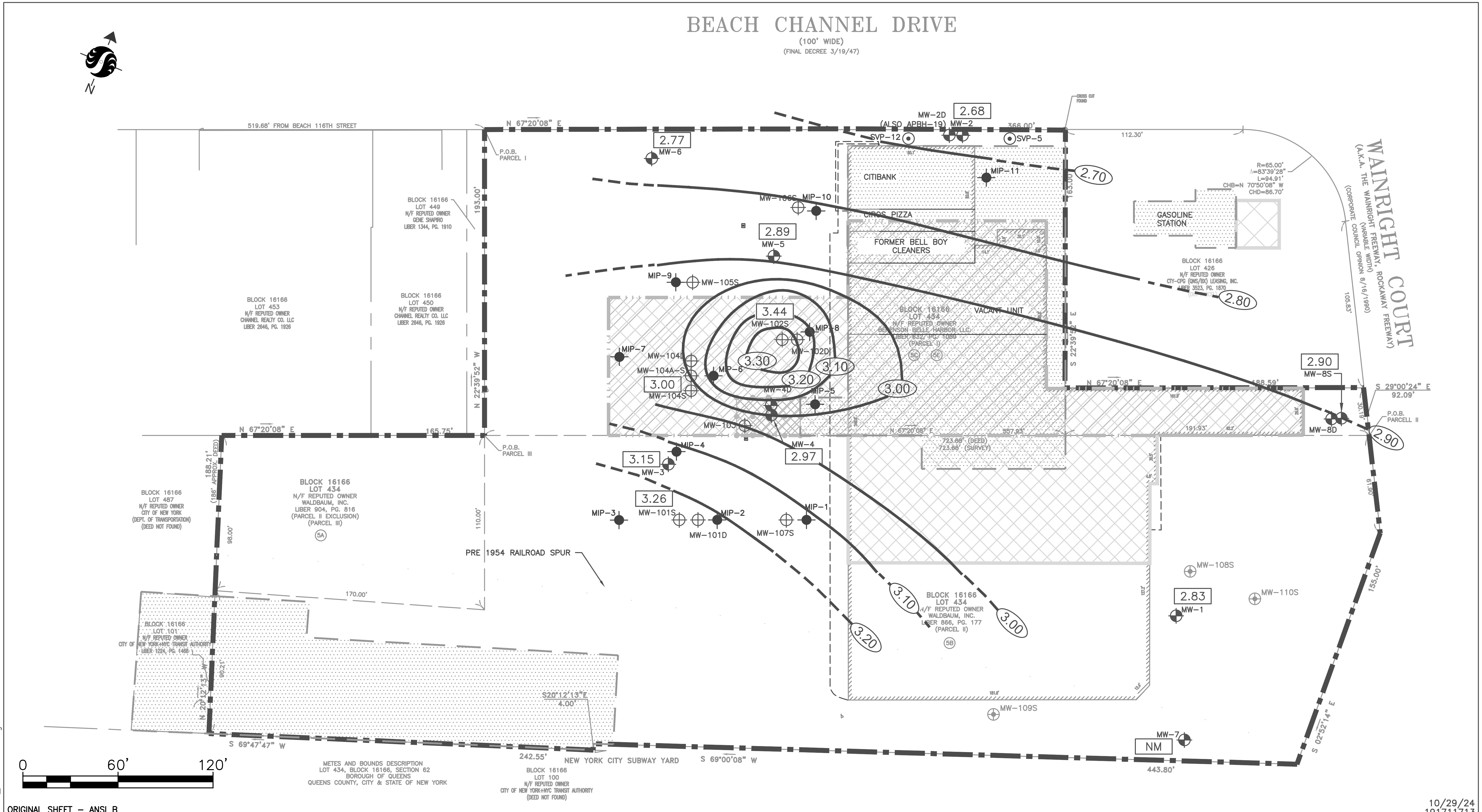
Client/Project
BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
4

Title
GROUND WATER CONTOUR PLAN



ORIGINAL SHEET – ANSI B

\\US0287-PPFSS01\workgroup\1917\active\191711713\03_data\gis_cad\cad\Belle harbor plan FIG
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- 2.40 – GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- NM – NOT MEASURED
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY

Notes

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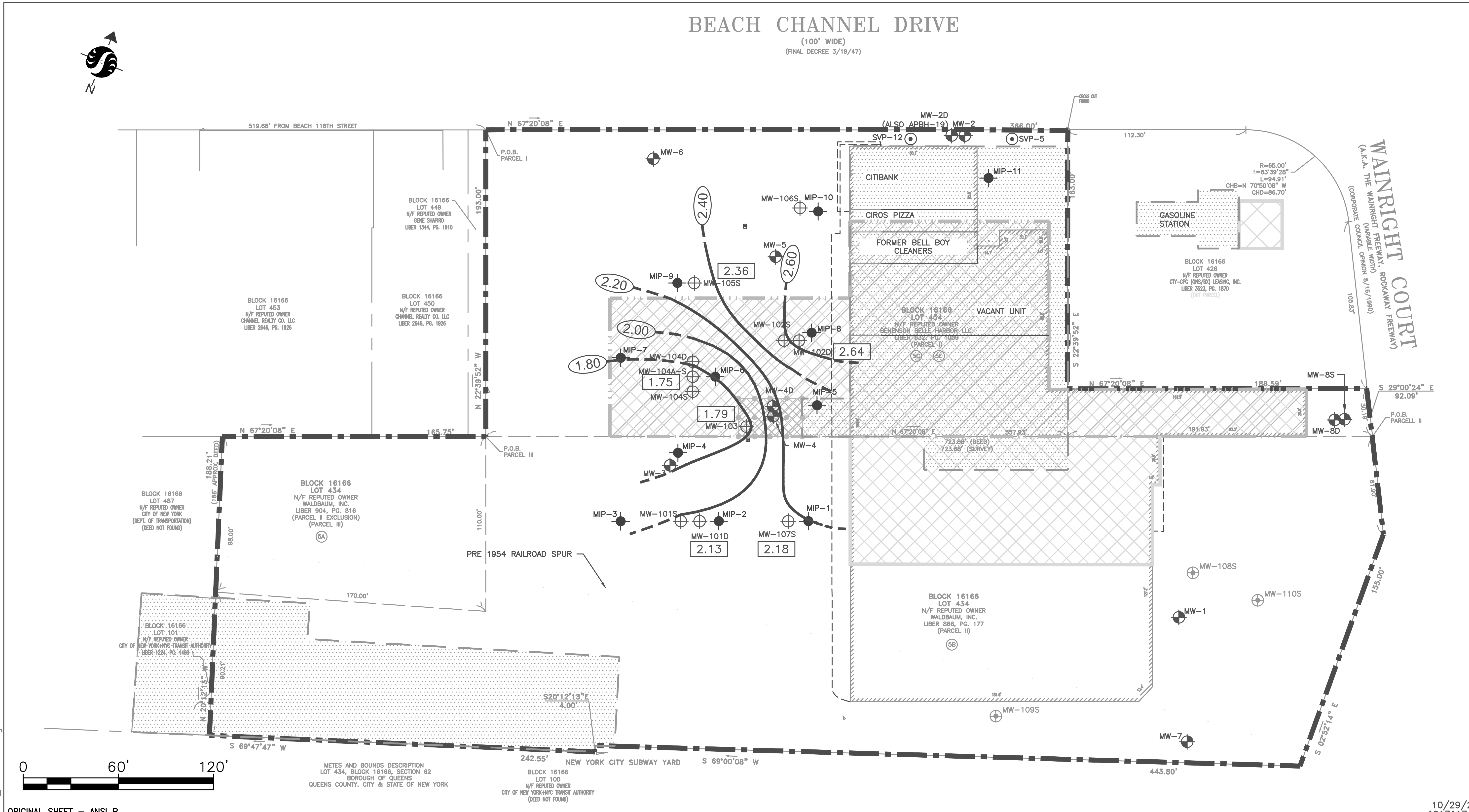
Client/Project
BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
4a

Title
GROUNDWATER CONTOUR MAP
SHALLOW WELLS, LOW TIDE



\\US0287-PPFSS01\workgroup\1917\active\191711713\03_data\gis_cad\cad\Belle harbor plan FIG
4a-4e_10-29-24.dwg

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Legend

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Notes

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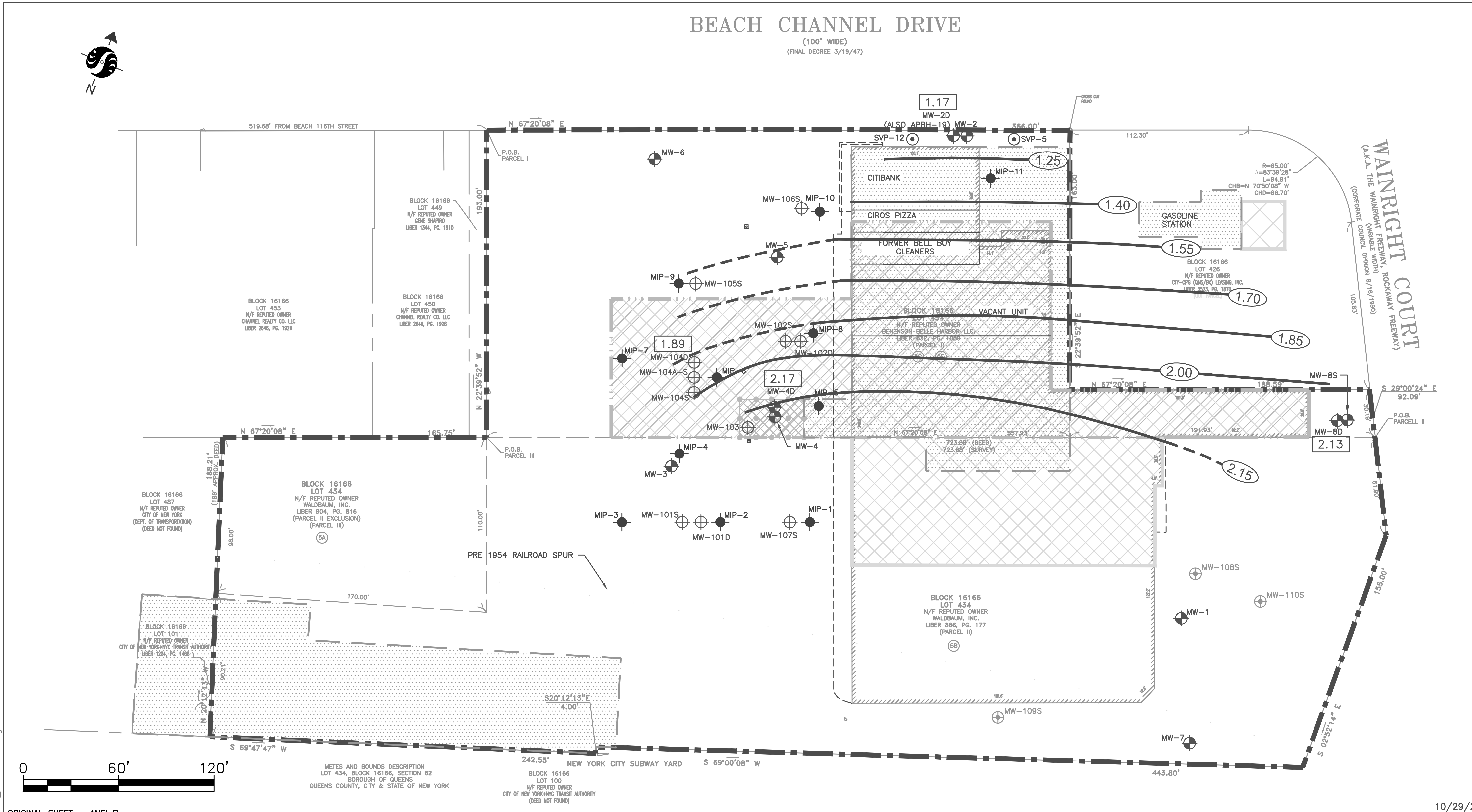
Client/Project
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
4b

Title
GROUNDWATER CONTOUR MAP
MID-LEVEL WELLS, LOW TIDE



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- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY

Notes

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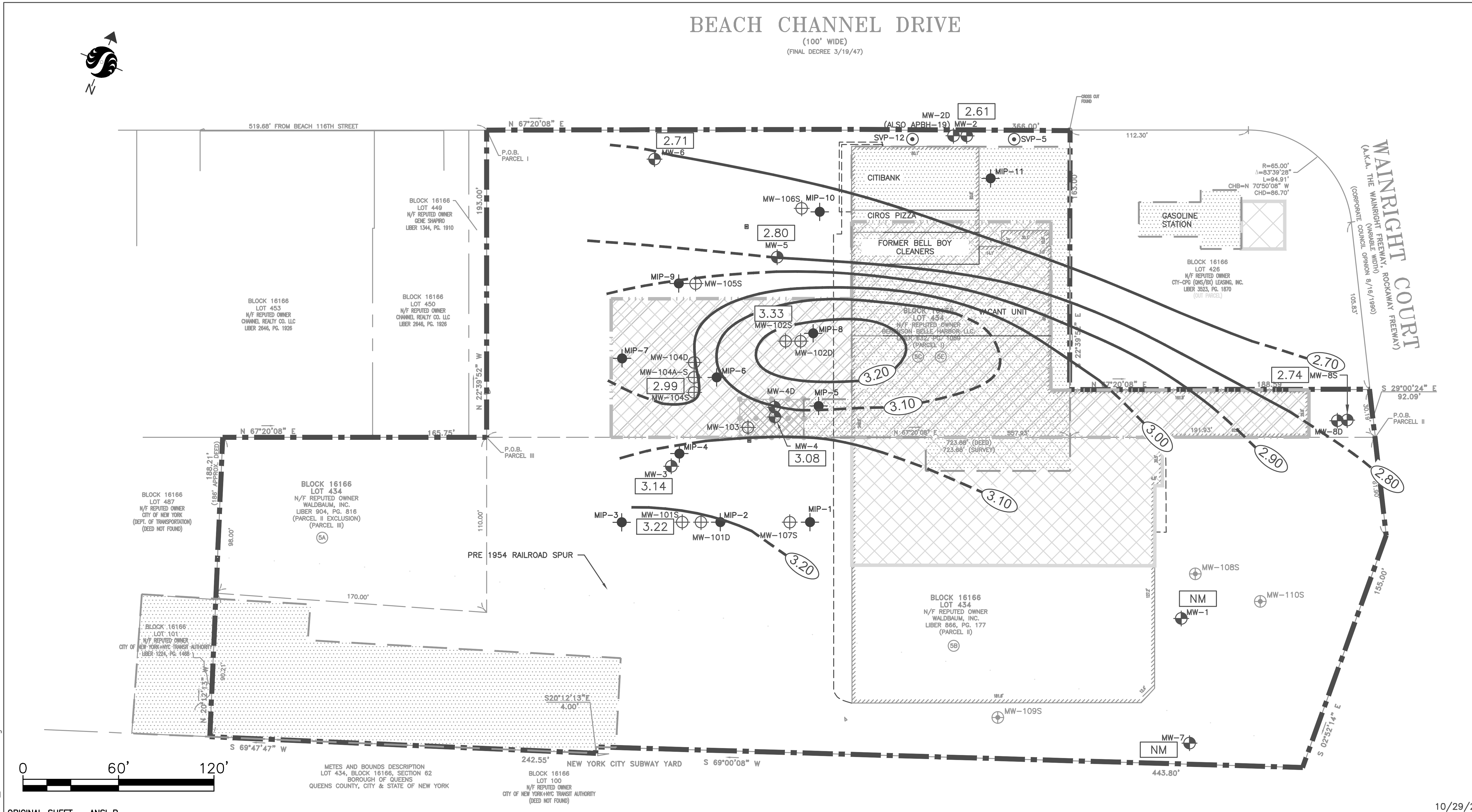
Client/Project
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
4c

Title
GROUNDWATER CONTOUR MAP
DEEP WELLS, LOW TIDE

\\US0287-PPFSS01\workgroup\1917\active\191711713\03_data\gis_cad\cad\Belle harbor plan FIG 4a-4e_10-29-24.dwg



Legend

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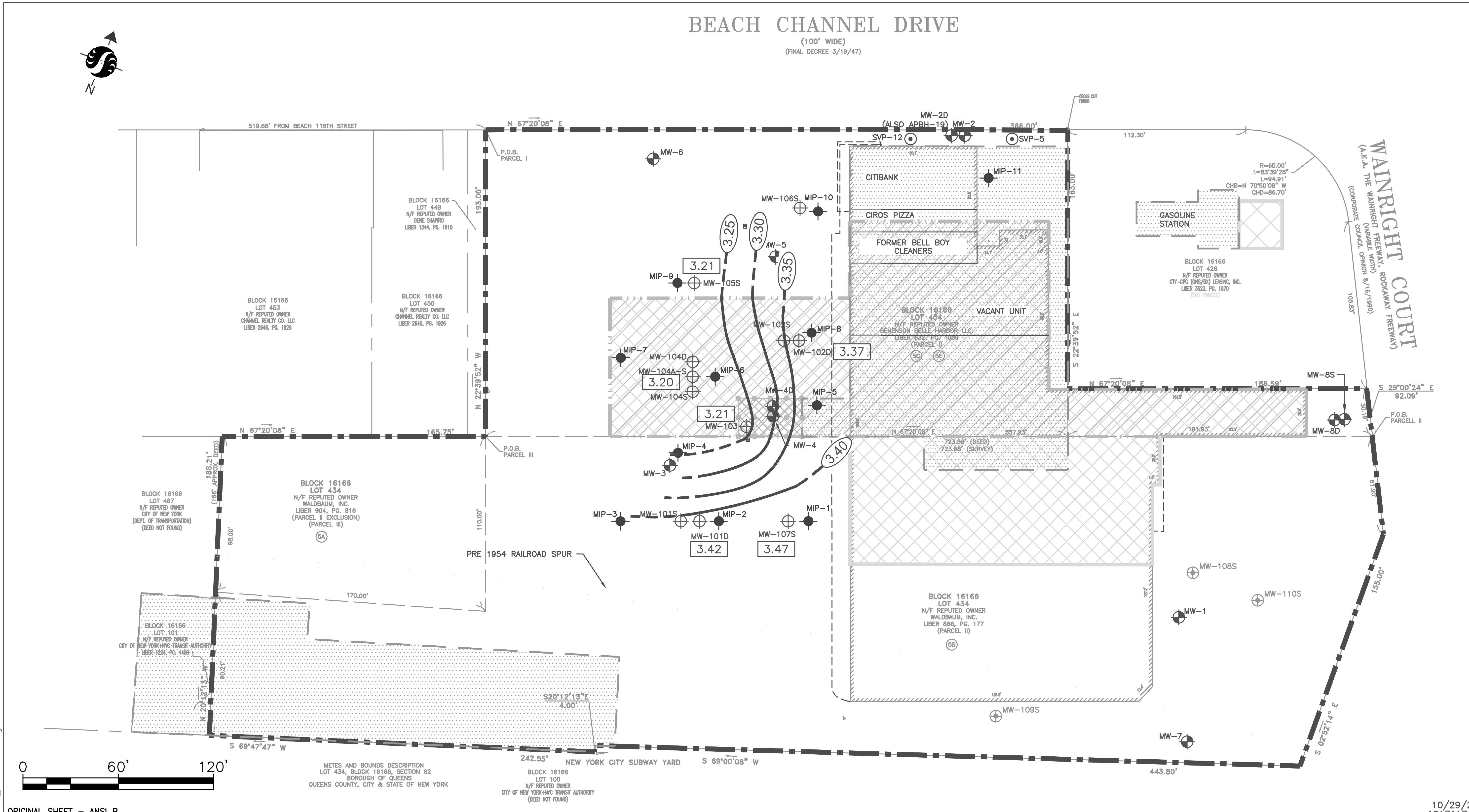
Client/Project
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
4d

Title
GROUNDWATER CONTOUR MAP SHALLOW WELLS, HIGH TIDE



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Legend

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- PRE CIRCA 1980
- SITE/BCP BOUNDARY

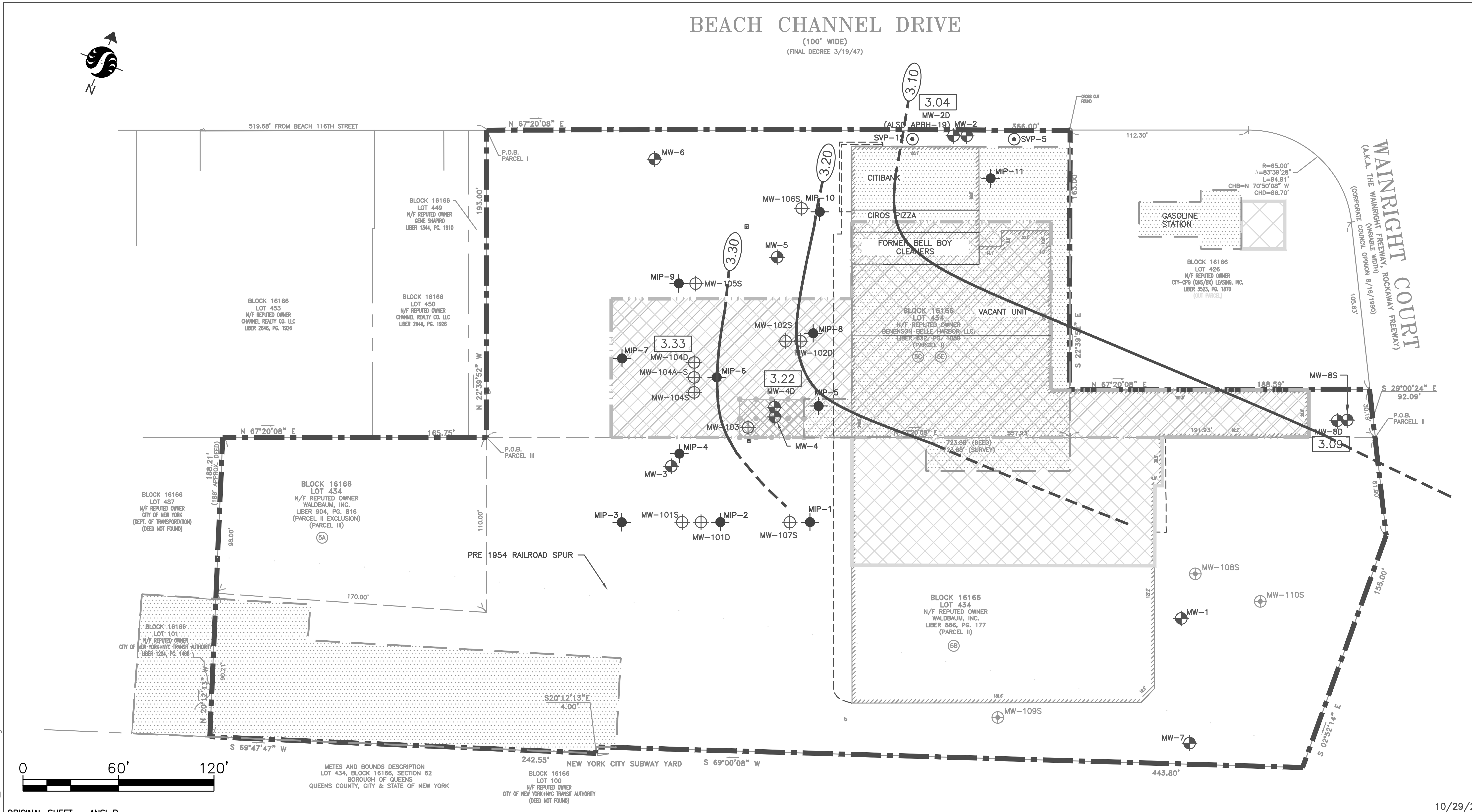
Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC.

Client/Project
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
4e

Title
GROUNDWATER CONTOUR MAP
MID-LEVEL WELLS, HIGH TIDE



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\\US0287-PPFSS01\workgroup\1917\active\191711713\03_data\gis_cad\cad\Belle harbor plan FIG 4a-4e_10-29-24.dwg

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- NM – NOT MEASURED
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- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC.

Client/Project
BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
4f

Title
GROUNDWATER CONTOUR MAP
DEEP WELLS, HIGH TIDE

LEGEND

- GEOPROBE BORING (STANTEC JULY 2015)
- MONITORING WELL (INSTALLED BY STANTEC)
- MGP RESIDUALS GROUNDWATER PROBE
- MGP RESIDUALS SOIL BORING
- MONITORING WELL (INSTALLED BY WHITESTONE)
- PREVIOUS INVESTIGATION SOIL BORING (MPI DATA)
- BUILDING BOUNDARY
- SITE/BCP BOUNDARY

SOURCE:

1. 2021 ESRI WORLD IMAGERY
2. RESIDUAL INVESTIGATION LOCATIONS BASED ON SURVEY CONDUCTED ON 9/25/2013 BY NY STATE LICENSED SURVEY NO. 050146.
3. PREVIOUS INVESTIGATION LOCATIONS ARE APPROXIMATE APPROXIMATE LOCATIONS FROM FIGURE 4 2010 SAMPLING LOCATION PLAN BY STANTEC

0 60 120

SCALE, FEET

Stantec

Project Location	Belle Harbor Shopping Center 112-115 Beach Channel Drive Queens (Far Rockaway), New York	Prepared by MC 2023-10-16 TR Review by DFM 2023-10-16 IR Review by BN 2023-10-16

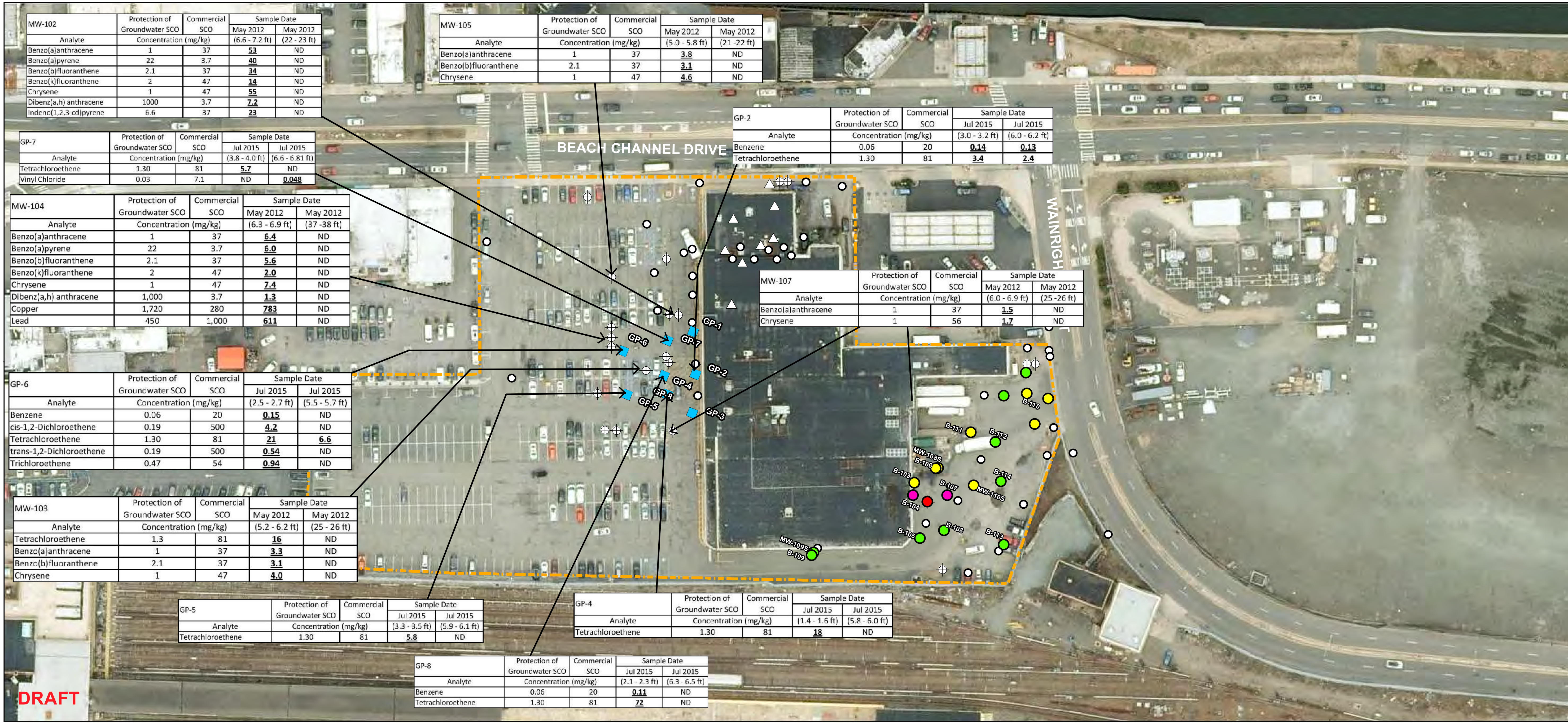
Client/Project 195601412

Client = Stop & Shop Supermarket Company
Project = Belle Harbor RI
Report = RI/RAWP

Figure No.
5

DRAFT

Title
Soil Sample Locations



MW-102	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			May 2012	May 2012
Analyte	Concentration (mg/kg)		(6.6 - 7.2 ft)	(22 - 23 ft)
Benzo(a)anthracene	1	37	**53**	ND
Benzo(a)pyrene	22	3.7	**40**	ND
Benzo(b)fluoranthene	2.1	37	**34**	ND
Benzo(k)fluoranthene	2	47	**14**	ND
Chrysene	1	47	**55**	ND
Dibenz(a,h) anthracene	1000	3.7	**7.2**	ND
Indeno(1,2,3-cd)pyrene	6.6	37	**23**	ND

MW-105	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			May 2012	May 2012
Analyte	Concentration (mg/kg)		(5.0 - 5.8 ft)	(21 -22 ft)
Benzo(a)anthracene	1	37	**3.8**	ND
Benzo(b)fluoranthene	2.1	37	**3.1**	ND
Chrysene	1	47	**4.6**	ND

GP-2	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			Jul 2015	Jul 2015
Analyte	Concentration (mg/kg)		(3.0 - 3.2 ft)	(6.0 - 6.2 ft)
Benzene	0.06	20	**0.14**	**0.13**
Tetrachloroethene	1.30	81	**3.4**	**2.4**

GP-7	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			Jul 2015	Jul 2015
Analyte	Concentration (mg/kg)		(3.8 - 4.0 ft)	(6.6 - 6.81 ft)
Tetrachloroethene	1.30	81	**5.7**	ND
Vinyl Chloride	0.03	7.1	ND	**0.048**

MW-104	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			May 2012	May 2012
Analyte	Concentration (mg/kg)		(6.3 - 6.9 ft)	(37 -38 ft)
Benzo(a)anthracene	1	37	**6.4**	ND
Benzo(a)pyrene	22	3.7	**6.0**	ND
Benzo(b)fluoranthene	2.1	37	**5.6**	ND
Benzo(k)fluoranthene	2	47	**2.0**	ND
Chrysene	1	47	**7.4**	ND
Dibenz(a,h) anthracene	1,000	3.7	**1.3**	ND
Copper	1,720	280	**783**	ND
Lead	450	1,000	**611**	ND

MW-107	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			May 2012	May 2012
Analyte	Concentration (mg/kg)		(6.0 - 6.9 ft)	(25 -26 ft)
Benzo(a)anthracene	1	37	**1.5**	ND
Chrysene	1	56	**1.7**	ND

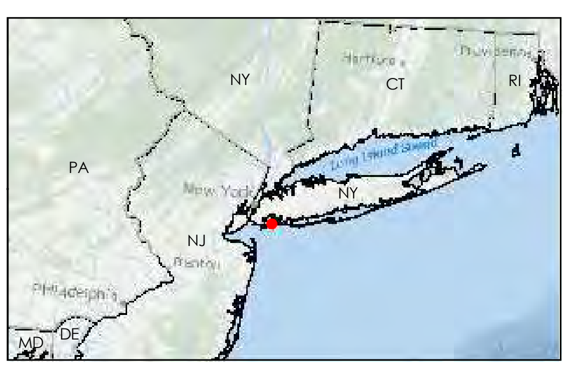
GP-6	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			Jul 2015	Jul 2015
Analyte	Concentration (mg/kg)		(2.5 - 2.7 ft)	(5.5 - 5.7 ft)
Benzene	0.06	20	**0.15**	ND
cis-1,2-Dichloroethene	0.19	500	**4.2**	ND
Tetrachloroethene	1.30	81	**21**	**6.6**
trans-1,2-Dichloroethene	0.19	500	**0.54**	ND
Trichloroethene	0.47	54	**0.94**	ND

MW-103	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			May 2012	May 2012
Analyte	Concentration (mg/kg)		(5.2 - 6.2 ft)	(25 - 26 ft)
Tetrachloroethene	1.3	81	**16**	ND
Benzo(a)anthracene	1	37	**3.3**	ND
Benzo(b)fluoranthene	2.1	37	**3.1**	ND
Chrysene	1	47	**4.0**	ND

GP-5	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			Jul 2015	Jul 2015
Analyte	Concentration (mg/kg)		(3.3 - 3.5 ft)	(5.9 - 6.1 ft)
Tetrachloroethene	1.30	81	**5.8**	ND

GP-4	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			Jul 2015	Jul 2015
Analyte	Concentration (mg/kg)		(1.4 - 1.6 ft)	(5.8 - 6.0 ft)
Tetrachloroethene	1.30	81	**18**	ND

GP-8	Protection of Groundwater SCO	Commercial SCO	Sample Date	
			Jul 2015	Jul 2015
Analyte	Concentration (mg/kg)		(2.1 - 2.3 ft)	(6.3 - 6.5 ft)
Benzene	0.06	20	**0.11**	ND
Tetrachloroethene	1.30	81	**72**	ND



Notes
1. Coordinate System: NAD 1983 StatePlane New York Long Island FIPS 3104 Feet
2. Data Sources:
3. Background: 2021 ESRI World Imagery

Legend

PHYSICAL MGP IMPACTS
- TAR SATURATED
- COATED MATERIAL, LENSES
- STAINING, ODOR
- NO OBSERVED IMPACTS
- PREVIOUS INVESTIGATION MONITORING WELL
- PREVIOUS INVESTIGATION SOIL BORING
- PREVIOUS INVESTIGATION SOIL VAPOR SAMPLE
- BCP SITE BOUNDARY
- GEOPROBE BORING (STANTEC JULY 2015)

BOLD = Concentration Exceeds SCO

0 100 200 Feet
(At original document size of 11x17)
1:1,200

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Project Location Belle Harbor Shopping Center
112-115 Beach Channel Drive
Queens (Far Rockaway), New York

Prepared by MC 2023-10-16
TR Review by DFM 2023-10-16
IR Review by BN 2023-10-16

Client/Project 195601412
Client = Stop & Shop Supermarket Company
Project = Belle Harbor RI
Report = RI/RAWP

Figure No.
5A DRAFT

Title
Compounds in Soils Exceeding Soil Cleanup Objectives: Western Portion

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-107 (8.6-10) 5/16/2012	B-107 (11-12) 5/16/2012	B107 (22-24) 5/16/2012
BTEX (mg/kg)					
Benzene	0.06	20	1.1 U	**0.64 J**	0.001 U
Toluene	0.70	500	0.33 J	**120**	0.001 U
Ethylbenzene	1	390	**26**	**97**	0.001 U
Total Xylene	1.2	500	**22**	**370**	0.0031 U
Total BTEX	NE	NE	48.33	587.64	ND
PAHs (mg/kg)					
Acenaphthylene	365	500	3.3 J	140	0.077 J
Benzo(a)anthracene	1	37	**7.4**	**36**	0.064 J
Benzo(b)fluoranthene	2.1	37	**3.3**	**15**	0.03 J
Benzo(k)fluoranthene	2	47	1.4	**6.5**	0.037 U
Benzo(a)pyrene	22	3.7	**5.6**	**27**	0.05
Chrysene	1	47	**7.1**	**34**	0.063 J
Dibenz(a,h)anthracene	1000	3.7	0.56	3.1	0.037 U
Flourene	386	500	11	100	0.073 J
Indeno(1,2,3-cd)pyrene	6.6	37	2	**11**	0.037 U
Naphthalene	12	500	0.71 J	**180**	0.37 U
Phenanthrene	1000	47	45	**270**	0.31 J
Total PAHs	NE	NE	145.17	1300.6	1.069
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.67 J	0.5 UJ	0.29 J
Total Cyanide	40	27	3.6 J	0.26 J	0.58 J

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-106 (6.5-7.5) 5/17/2012	B-106 (12-14) 5/17/2012	B-106 (28-30) 5/18/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	0.361	0.00077
PAHs (mg/kg)					
Total PAHs	NE	NE	ND	0.139	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.51 U	0.54 U	0.8
Total Cyanide	40	27	10	0.22 J	0.59 U

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-111 (6.5-7.5) 5/25/2012	B-111 (13.5-15) 5/25/2012	B-111 (21-23) 5/25/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	0.02086	0.00064
PAHs (mg/kg)					
Benzo(a)anthracene	1	37	**4.4**	0.04 U	0.036 U
Benzo(b)fluoranthene	2.1	37	**2.9**	0.04 U	0.036 U
Benzo(k)fluoranthene	2	47	1	0.04 U	0.036 U
Benzo(a)pyrene	22	3.7	3.1	0.04 U	0.036 U
Chrysene	1	47	**4.8**	0.4 U	0.36 U
Dibenz(a,h)anthracene	1000	3.7	0.5	0.04 U	0.036 U
Indeno(1,2,3-cd)pyrene	6.6	37	1.5	0.04 U	0.036 U
Total PAHs	NE	NE	49.87	ND	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.52 U	0.23 J	0.46 U
Total Cyanide	40	27	3.5	0.61 U	0.55 U

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-115 (1-3) 6/22/2015	B-115 (5-7) 6/22/2015
BTEX (mg/kg)				
Total BTEX	NE	NE	0.0103	ND
PAHs (mg/kg)				
Total PAHs	NE	NE	21.155	ND
Cyanide (mg/kg)				
Free Cyanide	NE	NE	2.3 U	2.3 U
Total Cyanide	40	27	18.7 J	0.6 J

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-110 (1-3) 5/22/2012	B-110 (5.5-7.5) 5/22/2012	B-110 (12-14) 5/22/2012	B-110 (21-23) 5/22/2012
BTEX (mg/kg)						
Total BTEX	NE	NE	0.00572	ND	ND	ND
Other VOCs (mg/kg)						
Acetone	0.03	500	0.011 U	0.013 U	0.011 U	0.012 U
Total VOCs	NE	NE	0.01122	ND	0.0015	0.00071
PAHs (mg/kg)						
Benzo(a)anthracene	1	37	**10**	0.045 U	0.042 U	0.041 U
Benzo(b)fluoranthene	2.1	37	**5.7**	0.045 U	0.042 U	0.041 U
Benzo(k)fluoranthene	2	47	**2.7**	0.045 U	0.042 U	0.041 U
Benzo(a)pyrene	22	3.7	3.3	0.045 U	0.042 U	0.041 U
Chrysene	1	47	**13**	0.45 U	0.42 U	0.41 U
Dibenz(a,h)anthracene	1000	3.7	1.1	0.045 U	0.042 U	0.041 U
Indeno(1,2,3-cd)pyrene	6.6	37	5	0.045 U	0.042 U	0.041 U
Total PAHs	NE	NE	208.2	ND	ND	ND
Cyanide (mg/kg)						
Free Cyanide	NE	NE	8.9	0.57 U	0.53 U	0.49 J
Total Cyanide	40	27	127	0.68 U	1.1	0.62 U

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-116 (1-3) 6/22/2015	B-116 (5-7) 6/22/2015
BTEX (mg/kg)				
Total BTEX	NE	NE	ND	ND
PAHs (mg/kg)				
Total PAHs	NE	NE	0.683	ND
Cyanide (mg/kg)				
Free Cyanide	NE	NE	2.1 U	2.9 U
Total Cyanide	40	27	0.55 J	1.4 J

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-117 (1-3) 6/22/2015	B-117 (5-7) 6/22/2015
BTEX (mg/kg)				
Total BTEX	NE	NE	0.0002	ND
PAHs (mg/kg)				
Total PAHs	NE	NE	7.76	ND
Cyanide (mg/kg)				
Free Cyanide	NE	NE	31.2	2.8 U
Total Cyanide	40	27	**103 J**	0.87 J

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-118 (1-3) 6/22/2015	B-118 (5-7) 6/22/2015	Dupe B-118 (5-7) 6/22/2015
BTEX (mg/kg)					
Total BTEX	NE	NE	0.0046	ND	0.00127
PAHs (mg/kg)					
Total PAHs	NE	NE	7.517	ND	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	2.9 U	2.7 U	2.9 U
Total Cyanide	40	27	1.4	0.35 J	1.8 J

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-112 (4.5-5.5) 5/23/2012	B-112 (10-12) 5/23/2012	B-112 (38-40) 5/23/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	ND	ND
PAHs (mg/kg)					
Total PAHs	NE	NE	5.018	ND	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.6 U	0.57 U	0.91
Total Cyanide	40	27	0.45 J	0.69 U	0.6 U

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-114 (7.5-9.5) 5/29/2012	B-114 (11-13) 5/29/2012	B-114 (18-20) 5/29/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	0.00831	ND	ND
PAHs (mg/kg)					
Total PAHs	NE	NE	0.555	ND	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.52 UJ	0.63 UJ	0.54 UJ
Total Cyanide	40	27	16.3	2.5	5.3

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	MW-110 S (7-9) 5/22/2012	MW-110 S (11-13) 5/22/2012	MW-110 S (15-17) 5/22/2012	DUPE MW-110 S (15-17) 5/22/2012
BTEX (mg/kg)						
Total BTEX	NE	NE	0.00021	ND	0.00025	0.00063
PAHs (mg/kg)						
Total PAHs	NE	NE	0.511	1.898	4.923	3.422
Cyanide (mg/kg)						
Free Cyanide	NE	NE	0.35 J	2.6 U	0.16 J	0.35 J
Total Cyanide	40	27	1.6 B	9.7 B	7.9 B	9.6 B

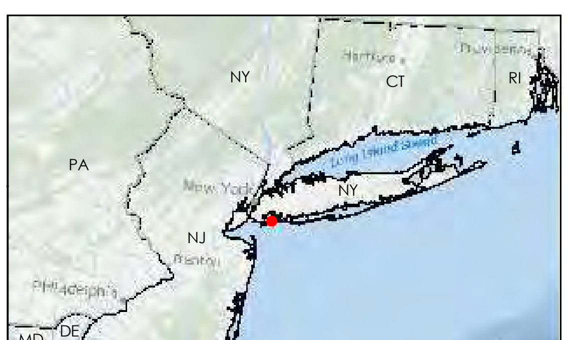
Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-113 (8-10) 5/22/2012	B-113 (13-15) 5/22/2012	B-113 (38-40) 5/22/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	ND	ND
PAHs (mg/kg)					
Total PAHs	NE	NE	ND	ND	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.48 U	0.56 U	0.51 U
Total Cyanide	40	27	0.45 J	0.38 J	0.61 U

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-104 (7-8) 5/16/2012	B-104 (9-10) 5/16/2012	B-104 (38-40) 5/16/2012
BTEX (mg/kg)					
Benzene	0.06	20	0.000024 J	**0.15 J**	0.11 U
Ethylbenzene	1	390	0.0012 U	**1.5**	0.11 U
Total Xylene	1.2	500	0.0035 U	**2.4**	0.34 U
Total BTEX	NE	NE	0.00024	4.31	ND
PAHs (mg/kg)					
Acenaphthene	98	500	0.4 U	45	0.41 U
Benzo(a)anthracene	1	37	0.32	**16**	0.041 U
Benzo(b)fluoranthene	2.1	37	0.29	**6.6**	0.041 U
Benzo(k)fluoranthene	2	47	0.085	**3.1**	0.041 U
Benzo(a)pyrene	22	3.7	0.42	**12**	0.041 U
Chrysene	1	47	0.35 J	**16**	0.41 U
Dibenz(a,h)anthracene	1000	3.7	0.038 J	1.3	0.041 U
Flourene	386	500	0.4 U	38	0.41 U
Indeno(1,2,3-cd)pyrene	6.6	37	0.2	4.1	0.041 U
Phenanthrene	1000	47	0.068 J	**120**	0.41 U
Total PAHs	NE	NE	2.927	394.6	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.53 U J	0.52 U J	0.52 U J
Total Cyanide	40	27	0.47 J	0.2 J	0.63 U J

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-103 (5-7) 5/18/2012	B-103 (10-12) 5/18/2012	B-103 (21-23) 5/18/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	0.04339	0.0002
PAHs (mg/kg)					
Total PAHs	NE	NE	0.07	0.312	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	2	0.54	0.13 J
Total Cyanide	40	27	9.8	0.48 J	0.61 U

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-109 (7-9) 5/22/2012	B-109 (12-14) 5/22/2012	B-109 (38-40) 5/22/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	ND	ND
PAHs (mg/kg)					
Total PAHs	NE	NE	ND	ND	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.49 U	0.5 U	0.59 U
Total Cyanide	40	27	0.76	1.6	0.68 U

Sample Name: / Sample Date:	Protection of Groundwater SCO	Commercial SCO	B-108 (8-10) 5/17/2012	B-108 (12-14) 5/17/2012	B-108 (30-32) 5/17/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	ND	ND
PAHs (mg/kg)					
Total PAHs	NE	NE	ND	ND	ND
Cyanide (mg/kg)					
Free Cyanide	NE	NE	0.51 UJ	0.51 UJ	0.14 J
Total Cyanide	40	27	7	0.99	0.66 U



Notes
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Legend

PHYSICAL MGP IMPACTS
- TAR SATURATED
- COATED MATERIAL, LENSES
- STAINING, ODOR
- NO OBSERVED IMPACTS
- PREVIOUS INVESTIGATION MONITORING WELL
- PREVIOUS INVESTIGATION SOIL BORING
- PREVIOUS INVESTIGATION SOIL VAPOR SAMPLE
- BCP SITE BOUNDARY
- GEOPROBE BORING (STANTEC JULY 2015)

BOLD = Concentration Exceeds SCO

0 100 200 Feet
(At original document size of 11x17)
1:1,200

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Stantec

Project Location: Belle Harbor Shopping Center, 112-115 Beach Channel Drive, Queens (Far Rockaway), New York

Prepared by MC 2024-10-31
TR Review by DFM 2024-10-31
IR Review by BN 2024-10-31

Client/Project 195601412
Client = Stop & Shop Supermarket Company
Project = Belle Harbor RI
Report = RI/RAWP

Figure No.
5B

DRAFT

Title
Compounds in Soils Exceeding Soil Cleanup Objectives: Eastern Portion

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LEGEND

- MONITORING WELL (INSTALLED BY STANTEC)
- MONITORING WELL (INSTALLED BY GEI)
- MONITORING WELL (INSTALLED BY WHITESTONE)
- PREVIOUS INVESTIGATION SOIL VAPOR SAMPLE
- Building Boundary
- SITE/BCP BOUNDARY

SOURCE:
1. 2021 ESRI WORLD IMAGERY
2. RESIDUAL INVESTIGATION LOCATIONS BASED ON SURVEY CONDUCTED ON 9/25/2013 BY NY STATE LICENSED SURVEY NO. 050146.
3. PREVIOUS INVESTIGATION LOCATIONS ARE APPROXIMATE APPROXIMATE LOCATIONS FROM FIGURE 4 2010 SAMPLING LOCATION PLAN BY STANTEC

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Stantec

Project Location: Belle Harbor Shopping Center, 112-115 Beach Channel Drive, Queens (Far Rockaway), New York

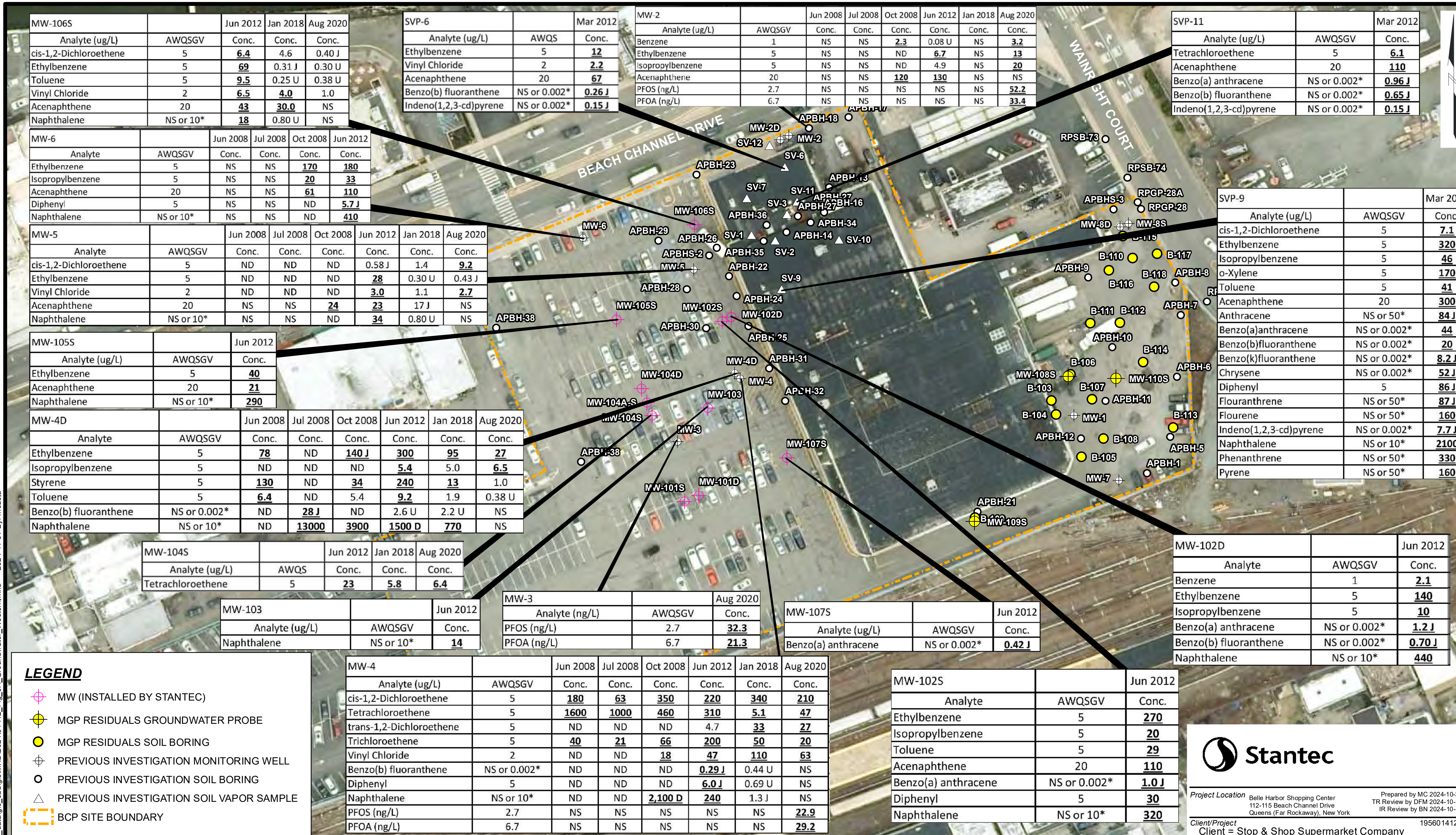
Prepared by LRT 2021-08-20
TR Review by DFM 2021-08-20
IR Review by BN 2021-08-20

Client/Project: 195601412
Client = Stop & Shop Supermarket Company
Project = Belle Harbor RI
Report = RI/RAWP

Figure No. 6

DRAFT

Title: **Groundwater Sample Locations**



MW-106S		Jun 2012	Jan 2018	Aug 2020
Analyte (ug/L)	AWQSGV	Conc.	Conc.	Conc.
cis-1,2-Dichloroethene	5	**6.4**	4.6	0.40 J
Ethylbenzene	5	**69**	0.31 J	0.30 U
Toluene	5	**9.5**	0.25 U	0.38 U
Vinyl Chloride	2	**6.5**	**4.0**	1.0
Acenaphthene	20	**43**	**30.0**	NS
Naphthalene	NS or 10*	**18**	0.80 U	NS

SVP-6		Mar 2012
Analyte (ug/L)	AWQS	Conc.
Ethylbenzene	5	**12**
Vinyl Chloride	2	**2.2**
Acenaphthene	20	**67**
Benzo(b) fluoranthene	NS or 0.002*	**0.26 J**
Indeno(1,2,3-cd)pyrene	NS or 0.002*	**0.15 J**

MW-2		Jun 2008	Jul 2008	Oct 2008	Jun 2012	Jan 2018	Aug 2020
Analyte (ug/L)	AWQSGV	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
Benzene	1	NS	NS	**2.3**	0.08 U	NS	**3.2**
Ethylbenzene	5	NS	NS	ND	**6.7**	NS	**13**
Isopropylbenzene	5	NS	NS	ND	4.9	NS	**20**
Acenaphthene	20	NS	NS	**120**	**130**	NS	NS
PFOS (ng/L)	2.7	NS	NS	NS	NS	NS	**52.2**
PFOA (ng/L)	6.7	NS	NS	NS	NS	NS	**33.4**

SVP-11		Mar 2012
Analyte (ug/L)	AWQSGV	Conc.
Tetrachloroethene	5	**6.1**
Acenaphthene	20	**110**
Benzo(a) anthracene	NS or 0.002*	**0.96 J**
Benzo(b) fluoranthene	NS or 0.002*	**0.65 J**
Indeno(1,2,3-cd)pyrene	NS or 0.002*	**0.15 J**

MW-6		Jun 2008	Jul 2008	Oct 2008	Jun 2012
Analyte	AWQSGV	Conc.	Conc.	Conc.	Conc.
Ethylbenzene	5	NS	NS	**170**	**180**
Isopropylbenzene	5	NS	NS	**20**	**33**
Acenaphthene	20	NS	NS	**61**	**110**
Diphenyl	5	NS	NS	ND	**5.7 J**
Naphthalene	NS or 10*	NS	NS	ND	**410**

MW-5		Jun 2008	Jul 2008	Oct 2008	Jun 2012	Jan 2018	Aug 2020
Analyte	AWQSGV	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
cis-1,2-Dichloroethene	5	ND	ND	ND	0.58 J	1.4	**9.2**
Ethylbenzene	5	ND	ND	ND	**28**	0.30 U	0.43 J
Vinyl Chloride	2	ND	ND	ND	**3.0**	1.1	**2.7**
Acenaphthene	20	NS	NS	**24**	**23**	17 J	NS
Naphthalene	NS or 10*	NS	NS	ND	**34**	0.80 U	NS

SVP-9		Mar 2012
Analyte (ug/L)	AWQSGV	Conc.
cis-1,2-Dichloroethene	5	**7.1**
Ethylbenzene	5	**320**
Isopropylbenzene	5	**46**
o-Xylene	5	**170**
Toluene	5	**41**
Acenaphthene	20	**300**
Anthracene	NS or 50*	**84 J**
Benzo(a)anthracene	NS or 0.002*	**44**
Benzo(b)fluoranthene	NS or 0.002*	**20**
Benzo(k)fluoranthene	NS or 0.002*	**8.2 J**
Chrysene	NS or 0.002*	**52 J**
Diphenyl	5	**86 J**
Flouranthrene	NS or 50*	**87 J**
Flourene	NS or 50*	**160**
Indeno(1,2,3-cd)pyrene	NS or 0.002*	**7.7 J**
Naphthalene	NS or 10*	**2100**
Phenanthrene	NS or 50*	**330**
Pyrene	NS or 50*	**160**

MW-105S		Jun 2012
Analyte (ug/L)	AWQSGV	Conc.
Ethylbenzene	5	**40**
Acenaphthene	20	**21**
Naphthalene	NS or 10*	**290**

MW-4D		Jun 2008	Jul 2008	Oct 2008	Jun 2012	Jan 2018	Aug 2020
Analyte	AWQSGV	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
Ethylbenzene	5	**78**	ND	**140 J**	**300**	**95**	**27**
Isopropylbenzene	5	ND	ND	ND	**5.4**	5.0	**6.5**
Styrene	5	**130**	ND	**34**	**240**	**13**	1.0
Toluene	5	**6.4**	ND	5.4	**9.2**	1.9	0.38 U
Benzo(b) fluoranthene	NS or 0.002*	ND	**28 J**	ND	2.6 U	2.2 U	NS
Naphthalene	NS or 10*	ND	**13000**	**3900**	**1500 D**	**770**	NS

MW-104S		Jun 2012	Jan 2018	Aug 2020
Analyte (ug/L)	AWQS	Conc.	Conc.	Conc.
Tetrachloroethene	5	**23**	**5.8**	**6.4**

MW-103		Jun 2012
Analyte (ug/L)	AWQSGV	Conc.
Naphthalene	NS or 10*	**14**

MW-3		Aug 2020
Analyte (ng/L)	AWQSGV	Conc.
PFOS (ng/L)	2.7	**32.3**
PFOA (ng/L)	6.7	**21.3**

MW-107S		Jun 2012
Analyte (ug/L)	AWQSGV	Conc.
Benzo(a) anthracene	NS or 0.002*	**0.42 J**

MW-102D		Jun 2012
Analyte	AWQSGV	Conc.
Benzene	1	**2.1**
Ethylbenzene	5	**140**
Isopropylbenzene	5	**10**
Benzo(a) anthracene	NS or 0.002*	**1.2 J**
Benzo(b) fluoranthene	NS or 0.002*	**0.70 J**
Naphthalene	NS or 10*	**440**

MW-4		Jun 2008	Jul 2008	Oct 2008	Jun 2012	Jan 2018	Aug 2020
Analyte (ug/L)	AWQSGV	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
cis-1,2-Dichloroethene	5	**180**	**63**	**350**	**220**	**340**	**210**
Tetrachloroethene	5	**1600**	**1000**	**460**	**310**	**5.1**	**47**
trans-1,2-Dichloroethene	5	ND	ND	ND	4.7	**33**	**27**
Trichloroethene	5	**40**	**21**	**66**	**200**	**50**	**20**
Vinyl Chloride	2	ND	ND	**18**	**47**	**110**	**63**
Benzo(b) fluoranthene	NS or 0.002*	ND	ND	ND	**0.29 J**	0.44 U	NS
Diphenyl	5	ND	ND	ND	**6.0 J**	0.69 U	NS
Naphthalene	NS or 10*	ND	ND	**2,100 D**	**240**	1.3 J	NS
PFOS (ng/L)	2.7	NS	NS	NS	NS	NS	**22.9**
PFOA (ng/L)	6.7	NS	NS	NS	NS	NS	**29.2**

MW-102S		Jun 2012
Analyte	AWQSGV	Conc.
Ethylbenzene	5	**270**
Isopropylbenzene	5	**20**
Toluene	5	**29**
Acenaphthene	20	**110**
Benzo(a) anthracene	NS or 0.002*	**1.0 J**
Diphenyl	5	**30**
Naphthalene	NS or 10*	**320**

LEGEND

- MW (INSTALLED BY STANTEC)
- MGP RESIDUALS GROUNDWATER PROBE
- MGP RESIDUALS SOIL BORING
- PREVIOUS INVESTIGATION MONITORING WELL
- PREVIOUS INVESTIGATION SOIL BORING
- PREVIOUS INVESTIGATION SOIL VAPOR SAMPLE
- BCP SITE BOUNDARY

SOURCE:
1. 2021 ESRI WORLD IMAGERY
2. RESIDUAL INVESTIGATION LOCATIONS BASED ON SURVEY CONDUCTED ON 9/25/2013 BY NY STATE LICENSED SURVEY NO. 050146.
3. PREVIOUS INVESTIGATION LOCATIONS ARE APPROXIMATE APPROXIMATE LOCATIONS FROM FIGURE 4 2010 SAMPLING LOCATION PLAN BY STANTEC

0 80 160
SCALE, FEET

BOLD = Concentration Exceeds AWQSGV

Stantec

Project Location Belle Harbor Shopping Center
112-115 Beach Channel Drive
Queens (Far Rockaway), New York

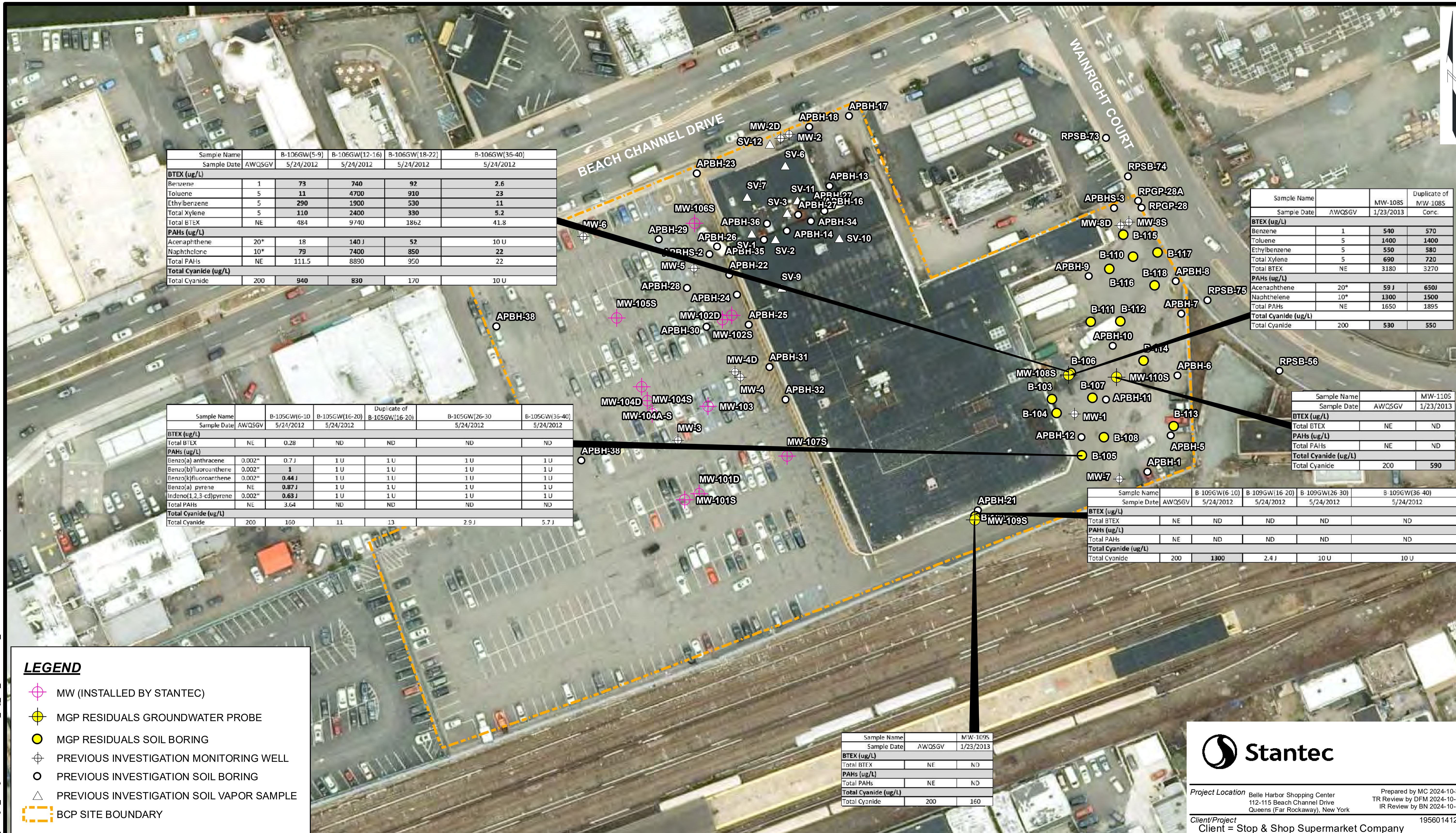
Prepared by MC 2024-10-31
TR Review by DFM 2024-10-31
IR Review by BN 2024-10-31

Client/Project 195601412
Client = Stop & Shop Supermarket Company
Project = Belle Harbor RI
Report = RI/RAWP

Figure No.
6A DRAFT

Title
Compounds in Groundwater Exceeding AWQSGVs: Western Portion

V:\1917\active\191711713\03_data\gis_cad\gis\MXD\2024\01412_Fig_6A_Groundwater_Western.mxd 2024-11-01 By: mcaola



Sample Name		B-106GW(5-9)	B-106GW(12-16)	B-106GW(18-22)	B-106GW(36-40)
Sample Date	AWQSGV	5/24/2012	5/24/2012	5/24/2012	5/24/2012
BTEX (ug/L)					
Benzene	1	**73**	**740**	**92**	**2.6**
Toluene	5	**11**	**4700**	**910**	**23**
Ethylbenzene	5	**290**	**1900**	**530**	**11**
Total Xylene	5	**110**	**2400**	**330**	**5.2**
Total BTEX	NE	484	9740	1862	41.8
PAHs (ug/L)					
Acenaphthene	20*	18	**140 J**	**52**	10 U
Naphthelene	10*	**79**	**7400**	**850**	**22**
Total PAHs	NE	111.5	8890	950	22
Total Cyanide (ug/L)					
Total Cyanide	200	**940**	**830**	170	10 U

Sample Name		B-105GW(6-10	B-105GW(16-20)	Duplicate of B-105GW(16-20)	B-105GW(26-30	B-105GW(36-40)
Sample Date	AWQSGV	5/24/2012	5/24/2012		5/24/2012	5/24/2012
BTEX (ug/L)						
Total BTEX	NE	0.28	ND	ND	ND	ND
PAHs (ug/L)						
Benzo(a) anthracene	0.002*	0.7 J	1 U	1 U	1 U	1 U
Benzo(b)fluoroanthene	0.002*	**1**	1 U	1 U	1 U	1 U
Benzo(k)fluoroanthene	0.002*	**0.44 J**	1 U	1 U	1 U	1 U
Benzo(a) pyrene	NE	**0.87 J**	1 U	1 U	1 U	1 U
Indeno(1,2,3-cd)pyrene	0.002*	**0.63 J**	1 U	1 U	1 U	1 U
Total PAHs	NE	3.64	ND	ND	ND	ND
Total Cyanide (ug/L)						
Total Cyanide	200	160	11	13	2.9 J	5.7 J

Sample Name		MW-108S	Duplicate of MW-108S
Sample Date	AWQSGV	1/23/2013	Conc.
BTEX (ug/L)			
Benzene	1	**540**	**570**
Toluene	5	**1400**	**1400**
Ethylbenzene	5	**550**	**580**
Total Xylene	5	**690**	**720**
Total BTEX	NE	3180	3270
PAHs (ug/L)			
Acenaphthene	20*	**59 J**	**650J**
Naphthelene	10*	**1300**	**1500**
Total PAHs	NE	1650	1895
Total Cyanide (ug/L)			
Total Cyanide	200	**530**	**550**

Sample Name		MW-110S
Sample Date	AWQSGV	1/23/2013
BTEX (ug/L)		
Total BTEX	NE	ND
PAHs (ug/L)		
Total PAHs	NE	ND
Total Cyanide (ug/L)		
Total Cyanide	200	**590**

Sample Name		B-109GW(6-10)	B-109GW(16-20)	B-109GW(26-30)	B-109GW(36-40)
Sample Date	AWQSGV	5/24/2012	5/24/2012	5/24/2012	5/24/2012
BTEX (ug/L)					
Total BTEX	NE	ND	ND	ND	ND
PAHs (ug/L)					
Total PAHs	NE	ND	ND	ND	ND
Total Cyanide (ug/L)					
Total Cyanide	200	**1300**	2.4 J	10 U	10 U

Sample Name		MW-109S
Sample Date	AWQSGV	1/23/2013
BTEX (ug/L)		
Total BTEX	NE	ND
PAHs (ug/L)		
Total PAHs	NE	ND
Total Cyanide (ug/L)		
Total Cyanide	200	160

LEGEND

- MW (INSTALLED BY STANTEC)
- MGP RESIDUALS GROUNDWATER PROBE
- MGP RESIDUALS SOIL BORING
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- PREVIOUS INVESTIGATION SOIL BORING
- PREVIOUS INVESTIGATION SOIL VAPOR SAMPLE
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Stantec

Project Location
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112-115 Beach Channel Drive
Queens (Far Rockaway), New York

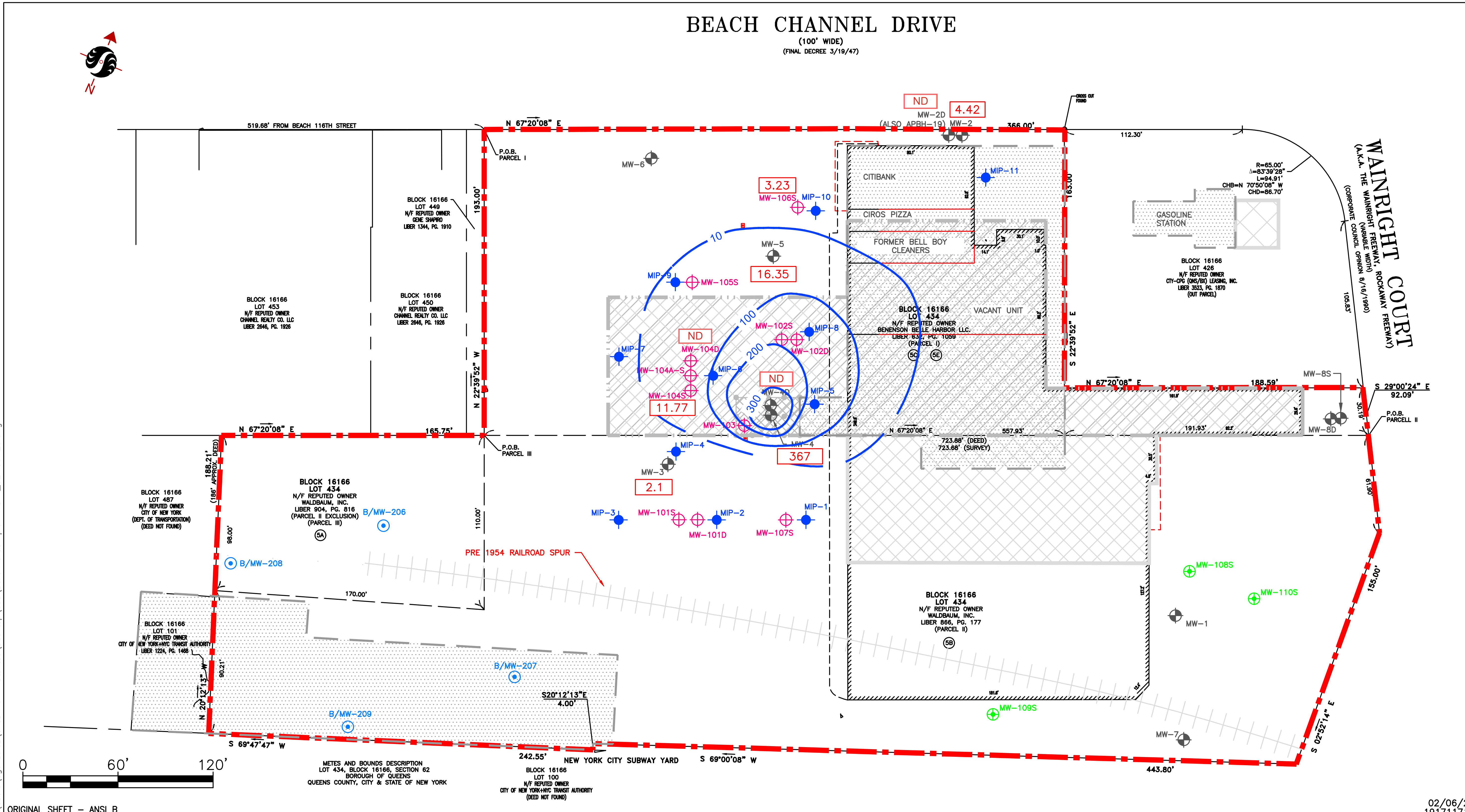
Prepared by MC 2024-10-31
TR Review by DFM 2024-10-31
IR Review by BN 2024-10-31

Client/Project
195601412
Client = Stop & Shop Supermarket Company
Project = Belle Harbor RI
Report = RI/RAWP

Figure No.
6B
DRAFT

Title
Compounds in Groundwater Exceeding AWQSGVs: Eastern Portion

V:\1917\active\191711713\03_data\gis_cad\gis\MXD\2024\2024_Fig_6B_Groundwater_Eastern.mxd 2024-11-01 By: mcaola



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Fax. 603.669.7636
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Legend

- MW-3 – MONITOR WELL (INSTALLED BY WHITESTONE)
- MW-101 – MONITORING WELL (INSTALLED BY STANTEC)
- – MIP GEOPROBE ®
- MW-108S – MONITORING WELL (INSTALLED BY GEI)
- – WELL SAMPLED FOR FULL SUITE OF WATER QUALITY
- B/MW-206 – PROPOSED SOIL BORING, CONVERTED TO MONITOR WELL LOCATION
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY
- ND NONE DETECTED
- 16.35 TOTAL CVOC CONCENTRATION (PPB): AUGUST 2020

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC.

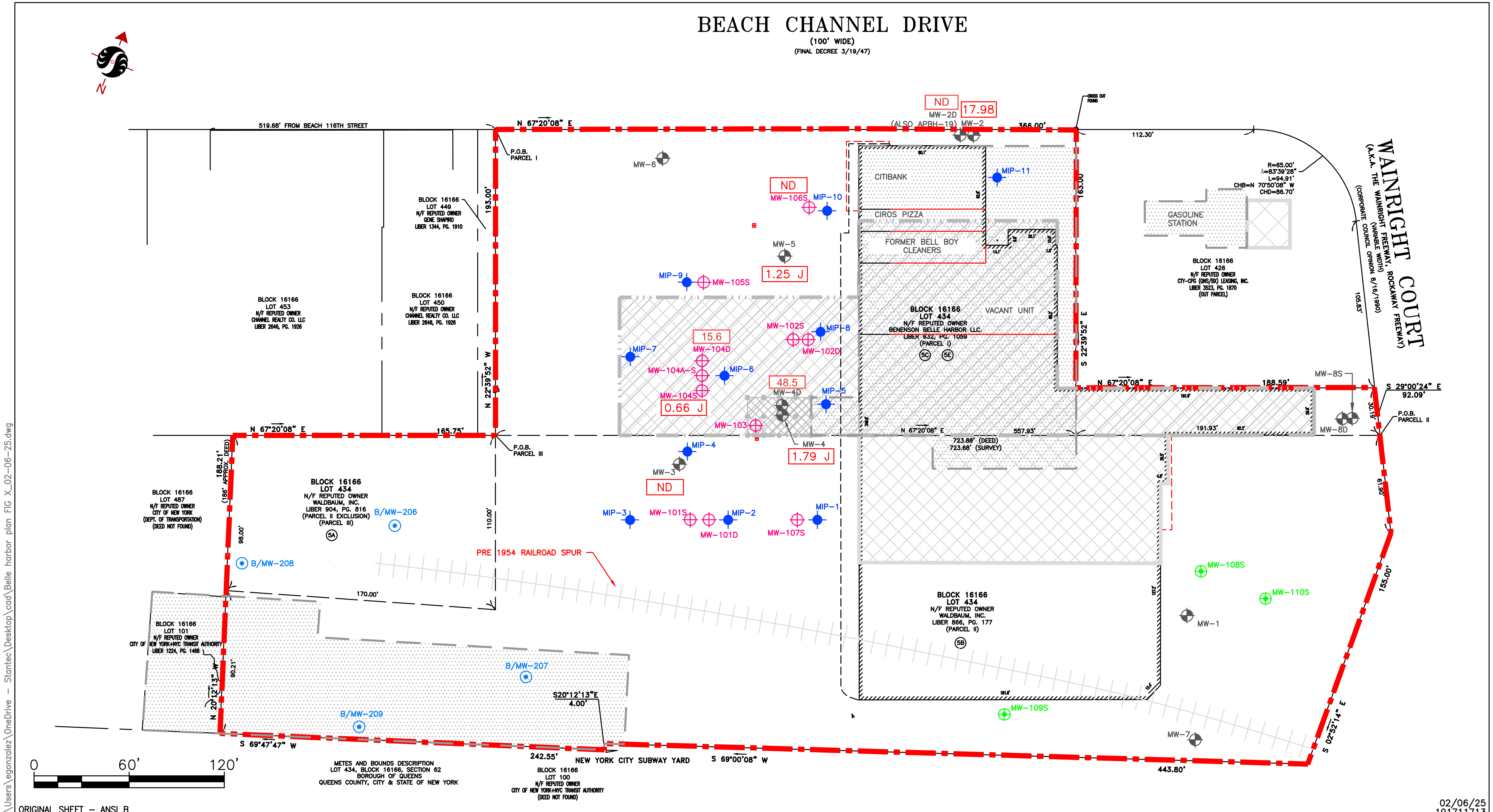
Client/Project

BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.
7A

Title

TOTAL CVOC CONCENTRATIONS IN GROUNDWATER: AUGUST 2020



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- B/MW-206 – PROPOSED SOIL BORING, CONVERTED TO MONITOR WELL LOCATION
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY
- J – ESTIMATED VALUE
- ND – NONE DETECTED
- 1.79 – TOTAL BTEX CONCENTRATION (PPB): AUGUST 2020

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC.

Client/Project

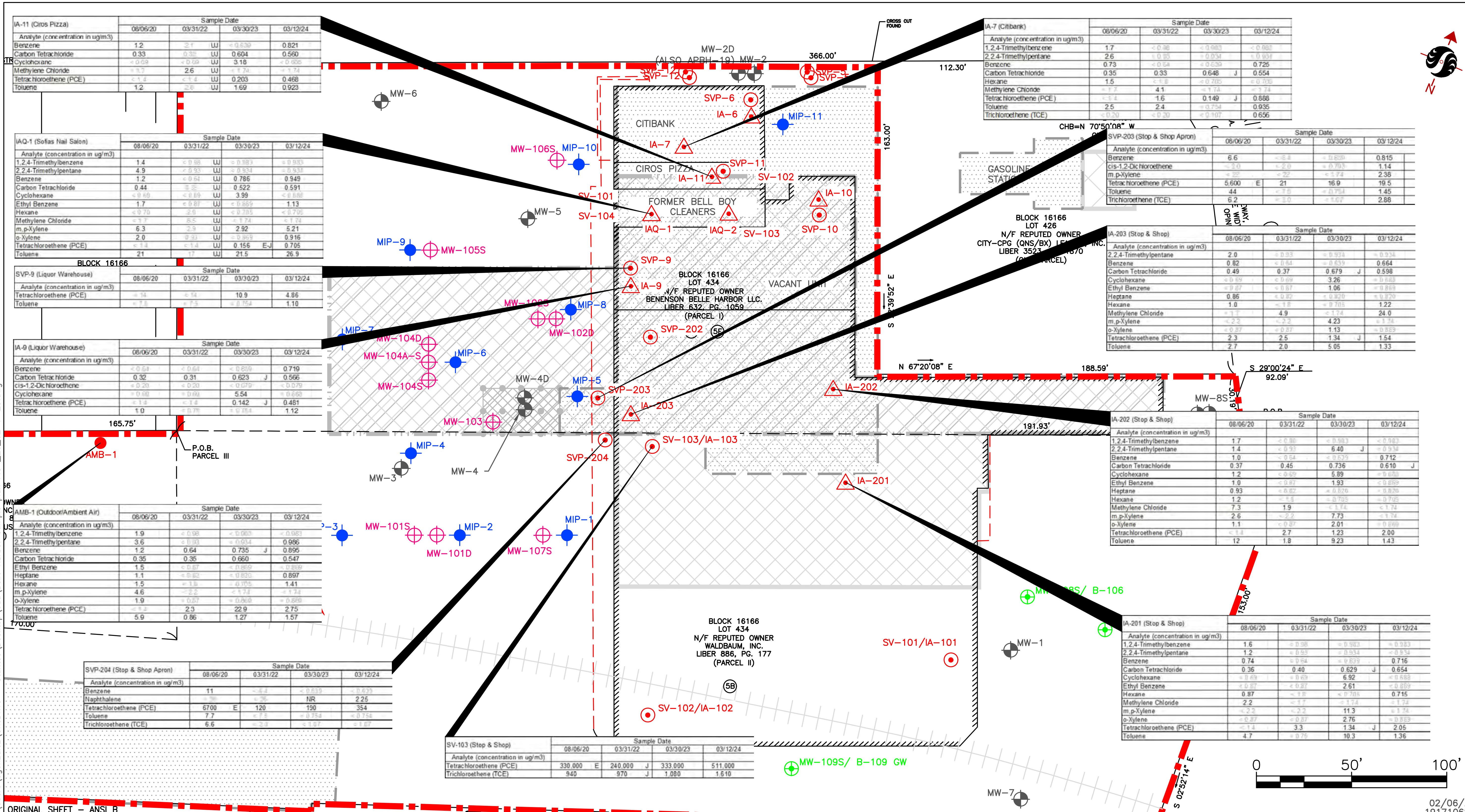
BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.

7B

Title

TOTAL BTEX CONCENTRATIONS IN GROUNDWATER: AUGUST 2020



IA-11 (Ciros Pizza)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
Benzene	1.2	2.1 UJ	< 0.639	0.821
Carbon Tetrachloride	0.33	0.32 UJ	0.604	0.560
Cyclohexane	< 0.69	< 0.69 UJ	3.18	< 0.688
Methylene Chloride	< 1.7	2.6 UJ	< 1.74	< 1.74
Tetrachloroethene (PCE)	< 1.4	< 1.4 UJ	0.203	0.468
Toluene	1.2	2.8 UJ	1.69	0.923

IAQ-1 (Sofias Nail Salon)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
1,2,4-Trimethylbenzene	1.4	< 0.98 UJ	< 0.983	< 0.983
2,2,4-Trimethylpentane	4.9	< 0.93 UJ	< 0.934	< 0.934
Benzene	1.2	< 0.64 UJ	0.786	0.949
Carbon Tetrachloride	0.44	0.35 UJ	0.522	0.591
Cyclohexane	< 0.69	< 0.69 UJ	3.99	< 0.688
Ethyl Benzene	1.7	< 0.87 UJ	< 0.869	1.13
Hexane	< 0.70	2.0 UJ	< 0.705	< 0.705
Methylene Chloride	< 1.7	8.5 UJ	< 1.74	< 1.74
m,p-Xylene	6.3	2.9 UJ	2.92	5.21
o-Xylene	2.0	0.93 UJ	< 0.869	0.916
Tetrachloroethene (PCE)	< 1.4	< 1.4 UJ	0.156 E-J	0.705
Toluene	21	17 UJ	21.5	26.9

BLOCK 16166

SVP-9 (Liquor Warehouse)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
Tetrachloroethene (PCE)	< 14	< 14	10.9	4.86
Toluene	< 7.5	< 7.5	< 0.754	1.10

IA-9 (Liquor Warehouse)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
Benzene	< 0.64	< 0.64	< 0.639	0.719
Carbon Tetrachloride	0.32	0.31	0.623 J	0.566
cis-1,2-Dichloroethene	< 0.20	< 0.20	< 0.079	< 0.079
Cyclohexane	< 0.69	< 0.69	5.54	< 0.663
Tetrachloroethene (PCE)	< 1.4	< 1.4	0.142 J	0.481
Toluene	1.0	< 0.75	< 0.754	1.12

AMB-1 (Outdoor/Ambient Air)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
1,2,4-Trimethylbenzene	1.9	< 0.98	< 0.983	< 0.983
2,2,4-Trimethylpentane	3.6	< 0.93	< 0.934	0.986
Benzene	1.2	0.64	0.735 J	0.895
Carbon Tetrachloride	0.35	0.35	0.660	0.547
Ethyl Benzene	1.5	< 0.87	< 0.869	< 0.869
Heptane	1.1	< 0.82	< 0.820	0.897
Hexane	1.5	< 1.8	< 0.705	1.41
m,p-Xylene	4.6	< 2.2	< 1.74	< 1.74
o-Xylene	1.9	< 0.87	< 0.869	< 0.869
Tetrachloroethene (PCE)	< 1.2	2.3	22.9	2.75
Toluene	5.9	0.86	1.27	1.57

IA-7 (Citibank)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
1,2,4-Trimethylbenzene	1.7	< 0.98	< 0.983	< 0.983
2,2,4-Trimethylpentane	2.6	< 0.93	< 0.934	< 0.934
Benzene	0.73	< 0.64	< 0.639	0.725
Carbon Tetrachloride	0.35	0.33	0.648 J	0.554
Hexane	1.5	< 1.8	< 0.705	< 0.705
Methylene Chloride	< 1.7	4.1	< 1.74	< 1.74
Tetrachloroethene (PCE)	< 1.4	1.6	0.149 J	0.888
Toluene	2.5	2.4	< 0.754	0.935
Trichloroethene (TCE)	< 0.20	< 0.20	< 0.107	0.656

SVP-203 (Stop & Shop Apron)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
Benzene	6.6	< 6.4	< 0.639	0.815
cis-1,2-Dichloroethene	< 2.0	< 2.0	< 0.793	1.14
m,p-Xylene	< 22	< 22	< 1.74	2.38
Tetrachloroethene (PCE)	5,600 E	21	16.9	19.5
Toluene	44	< 7.5	< 0.754	1.45
Trichloroethene (TCE)	6.2	< 2.0	< 1.07	2.88

IA-203 (Stop & Shop)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
2,2,4-Trimethylpentane	2.0	< 0.93	< 0.934	< 0.934
Benzene	0.82	< 0.64	< 0.639	0.664
Carbon Tetrachloride	0.49	0.37	0.679 J	0.598
Cyclohexane	< 0.69	< 0.69	3.26	< 0.688
Ethyl Benzene	< 0.87	< 0.87	1.06	< 0.869
Heptane	0.86	< 0.82	< 0.820	< 0.820
Hexane	1.0	< 1.8	< 0.705	1.22
Methylene Chloride	< 1.7	4.9	< 1.74	24.0
m,p-Xylene	< 2.2	< 2.2	4.23	< 1.74
o-Xylene	< 0.87	< 0.87	1.13	< 0.869
Tetrachloroethene (PCE)	2.3	2.5	1.34 J	1.54
Toluene	2.7	2.0	5.05	1.33

IA-202 (Stop & Shop)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
1,2,4-Trimethylbenzene	1.7	< 0.98	< 0.983	< 0.983
2,2,4-Trimethylpentane	1.4	< 0.93	6.40 J	< 0.934
Benzene	1.0	< 0.64	< 0.639	0.712
Carbon Tetrachloride	0.37	0.45	0.736	0.610 J
Cyclohexane	1.2	< 0.69	5.89	< 0.688
Ethyl Benzene	1.0	< 0.87	1.93	< 0.869
Heptane	0.93	< 0.82	< 0.820	< 0.820
Hexane	1.2	< 1.8	< 0.705	< 0.705
Methylene Chloride	7.3	1.9	< 1.74	< 1.74
m,p-Xylene	2.6	< 2.2	7.73	< 1.74
o-Xylene	1.1	< 0.87	2.01	< 0.869
Tetrachloroethene (PCE)	< 1.4	2.7	1.23	2.00
Toluene	12	1.8	9.23	1.43

IA-201 (Stop & Shop)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
1,2,4-Trimethylbenzene	1.6	< 0.98	< 0.983	< 0.983
2,2,4-Trimethylpentane	1.2	< 0.93	< 0.934	< 0.934
Benzene	0.74	< 0.64	< 0.639	0.716
Carbon Tetrachloride	0.36	0.40	0.629 J	0.654
Cyclohexane	< 0.69	< 0.69	6.92	< 0.688
Ethyl Benzene	< 0.87	< 0.87	2.61	< 0.869
Hexane	0.87	< 1.8	< 0.705	0.715
Methylene Chloride	2.2	< 1.7	< 1.74	< 1.74
m,p-Xylene	< 2.2	< 2.2	11.3	< 1.74
o-Xylene	< 0.87	< 0.87	2.76	< 0.869
Tetrachloroethene (PCE)	< 1.4	3.3	1.34 J	2.05
Toluene	4.7	< 0.75	10.3	1.36

SVP-204 (Stop & Shop Apron)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
Benzene	11	< 6.4	< 0.639	< 0.639
Naphthalene	< 36	< 26	NR	2.25
Tetrachloroethene (PCE)	6700 E	120	190	354
Toluene	7.7	< 7.5	< 0.754	< 0.754
Trichloroethene (TCE)	6.6	< 2.0	< 1.07	< 1.07

SV-103 (Stop & Shop)	Sample Date			
	08/06/20	03/31/22	03/30/23	03/12/24
Analyte (concentration in ug/m3)				
Tetrachloroethene (PCE)	330,000 E	240,000 J	333,000	511,000
Trichloroethene (TCE)	940	970 J	1,080	1,610

ORIGINAL SHEET – ANSI B

C:\Users\egonzalez\OneDrive – Stantec\Desktop\cad\Belle harbor sample plan FIG _2a_02-7-25.dwg

02/06/25
191710624

Stantec Consulting Services Inc.
5 Dartmouth Drive, Suite 200
Auburn NH U.S.A.
03032-3984
Tel. 603.669.8672
Fax. 603.669.7636
www.stantec.com

Legend

- MW-3 MONITOR WELL (INSTALLED BY WHITESTONE)
- MW-101 MONITORING WELL (INSTALLED BY STANTEC)
- MW-108S MONITORING WELL (INSTALLED BY GEI)
- SVP-5 SOIL VAPOR PROBE LOCATION
- IA-6 INDOOR AIR SAMPLE LOCATION
- MIP GEOPROBE®
- OUTDOOR/AMBIENT AIR
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE/BCP BOUNDARY

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC. SEPTEMBER 2012

Client/Project

BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

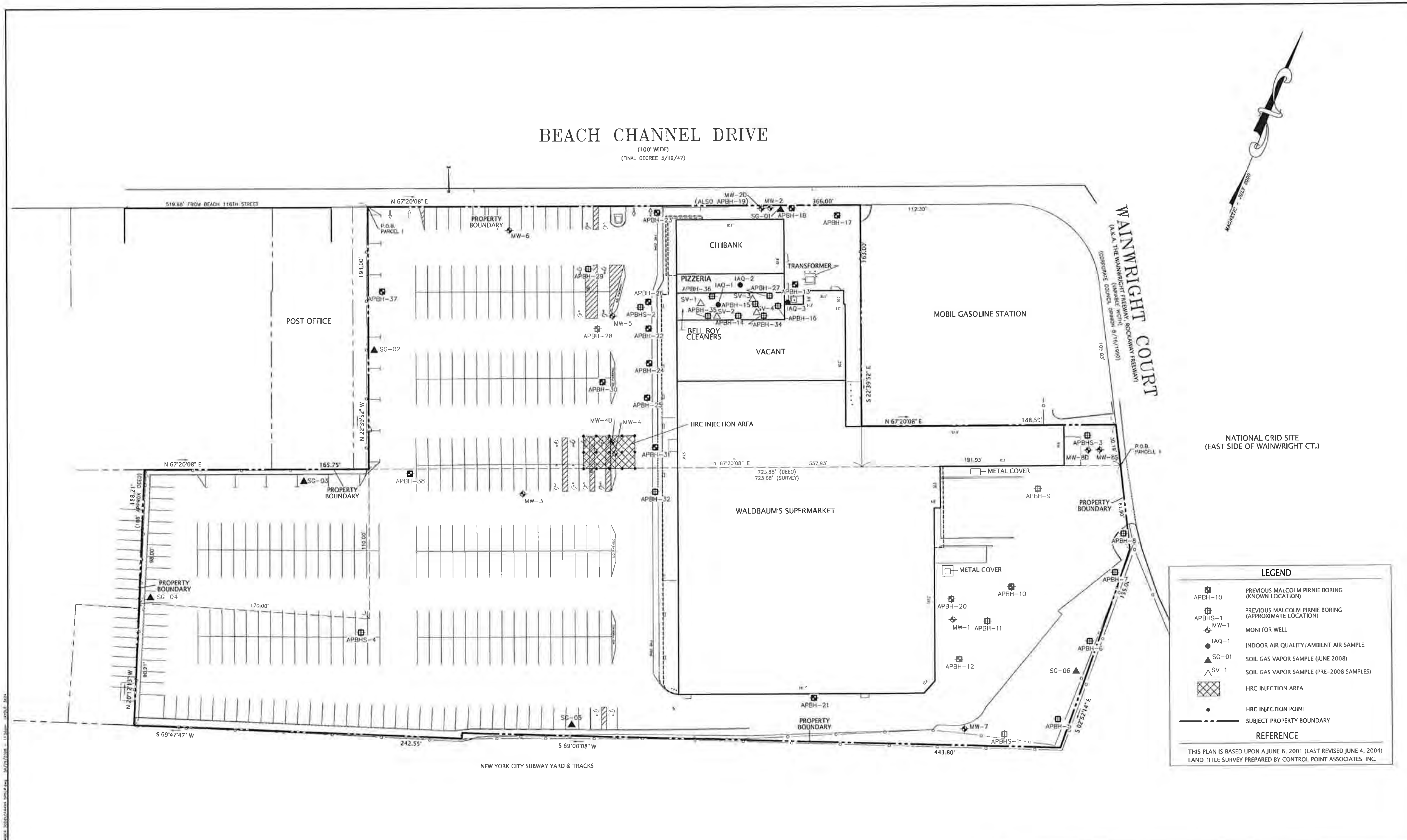
Figure No.
8

Title

VOC CONCENTRAIONS IN SUB-SLAB SOIL GAS AND INDOOR AIR

APPENDIX A

Pertinent Figures and Data Tables from Previous



TITLE: **SITE PLAN AND SAMPLE LOCATION PLAN**

WHITESTONE ASSOCIATES, INC.
35 TECHNOLOGY DRIVE
WARREN, NEW JERSEY 07059
908.668.7777 • 908.754.5936 FAX

CLIENT: THE GREAT ATLANTIC & PACIFIC TEA CO., INC.

PROJECT: BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS, QUEENS COUNTY, NEW YORK

PROJECT #:	BY:	PROJ. MGR.:	DATE:	SCALE:	FIGURE:
WJ0104499.000	RP	TKU	12/26/08	1" = 30'	2

TABLE 1
SOIL SAMPLING SUMMARY

Well #	Date Installed	Total Depth (feet)	Depth to GW (fbgs)	Soil Interval Sampled (fbgs)	Analyses Conducted
MW-1	3-12-03	17.0	7.5	1.0 to 1.5	V, S, M, P, PCB
				7.0 to 7.5	V, S, M, P, PCB
MW-2	3-12-03	17.0	7.5	1.0 to 1.5	V, S, M, P, PCB
				7.0 to 7.5	V, S, M, P, PCB
MW-3	3-13-03	17.0	7.0	2.0 to 2.5	V, S, M, P, PCB
				6.5 to 7.0	V, S, M, P, PCB
MW-4	3-13-03	16.0	7.0	NS	NS
MW-5	3-14-03	16.0	7.0	NS	NS
MW-6	3-14-03	16.0	7.0	NS	NS

Notes:

GW	Groundwater
fbgs	feet below ground surface
V	Volatile organic compounds by Method 8260
S	Semi-volatile organic compounds by Method 8270
M	Metals by Methods 6010/7471A/9010B
P	Pesticides by Method 8081
PCB	Polychlorinated biphenyls by Method 8082
NS	No soil sample submitted for analysis

TABLE 1
SOIL SAMPLING SUMMARY
MAY 2004

Well #/ Sample #	Date Installed	Total Depth (feet)	Depth to GW (fbgs)	Soil Interval Sampled (fbgs)	Analyses Conducted
MW-7/ MW7-S1	5-24-04	18.0	6.0	5.5 to 6.0	V, S, M
MW-8/ MW8-S1	5-24-04	17.0	5.0	4.5 to 6.0	V, S, M

Notes:

GW Groundwater
fbgs feet below ground surface
V Volatile organic compounds by Method 8260 (soil sample)
S Semi-volatile organic compounds by Method 8270
M Metals by Methods 6010/7471A/9010B

TABLE 3
Soil Sampling & Analysis Data Summary
Belle Harbor, NY

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor	NYSDEC Recommended Soil Cleanup Objective	4499-MW1-S1 R1789-01 3/12/03 SOIL 1.0	4499-MW1-S2 R1789-02 3/12/03 SOIL 1.0	4499-MW1-S2DL R1789-02DL 3/12/03 SOIL 10.0	4499-MW2-S1 R1789-03 3/12/03 SOIL 1.0	4499-MW2-S2 R1789-04 3/12/03 SOIL 1.0	FIELDBLANK R1789-05 3/12/03 WATER 1.0	TRIPBLANK R1789-06 3/12/03 WATER 1.0	4499-MW3-S1 R1789-07 3/13/03 SOIL 1.0	4499-MW3-S2 R1789-08 3/13/03 SOIL 1.0
VOCs-TCL										
Units	ppb or ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/L	ug/L	ug/Kg	ug/Kg
Chloromethane	NE	2.0 U	2.1 U	NA	1.8 U	2.0 U	0.51 U	0.51 U	1.8 U	2.0 U
Vinyl Chloride	200	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.79 U	0.79 U	1.0 U	1.2 U
Bromomethane	NE	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.38 U	0.38 U	1.0 U	1.2 U
Chloroethane	1900	1.5 U	1.6 U	NA	1.4 U	1.5 U	2.4 U	2.4 U	1.4 U	1.6 U
1,1-Dichloroethene	400	1.3 U	1.3 U	NA	1.2 U	1.3 U	0.69 U	0.69 U	1.1 U	1.3 U
Acetone	200	4.0 U	11	NA	3.7 U	4.2 U	3.5 U	3.5 U	3.6 U	4.2 U
Carbon Disulfide	2700	1.5 U	1.6 U	NA	1.4 U	1.5 U	0.72 U	0.72 U	1.4 U	1.6 U
Methylene Chloride	100	1.5 U	1.6 U	NA	1.4 U	1.5 U	1.8 U	1.8 U	1.4 U	1.6 U
trans-1,2-Dichloroethene	300	1.3 U	1.3 U	NA	1.2 U	1.3 U	0.81 U	0.81 U	1.4 U	1.6 U
1,1-Dichloroethane	200	1.0 U	1.1 U	NA	0.95 U	1.1 U	0.66 U	0.66 U	1.1 U	1.3 U
2-Butanone	300	5.7 U	6.1 U	NA	5.3 U	6.0 U	2.3 U	2.3 U	0.94 U	1.1 U
Carbon Tetrachloride	600	2.4 U	2.6 U	NA	2.2 U	2.5 U	0.47 U	0.47 U	5.2 U	6.0 U
cis-1,2-Dichloroethene	NE	1.0 U	1.1 U	NA	0.95 U	1.1 U	0.62 U	0.62 U	2.2 U	2.5 U
Chloroform	300	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.61 U	0.61 U	0.94 U	1.1 U
1,1,1-Trichloroethane	800	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.75 U	0.75 U	1.0 U	1.2 U
Benzene	60	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.71 U	0.71 U	1.0 U	1.2 U
1,2-Dichloroethane	100	1.3 U	1.3 U	NA	1.2 U	1.3 U	0.56 U	0.56 U	1.0 U	1.2 U
Trichloroethene	700	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.72 U	0.72 U	1.1 U	1.3 U
1,2-Dichloropropane	NE	0.92 U	0.98 U	NA	0.84 U	0.95 U	0.73 U	0.73 U	1.0 U	1.2 U
Bromodichloromethane	NE	0.92 U	0.98 U	NA	0.84 U	0.95 U	0.73 U	0.73 U	0.83 U	0.96 U
4-Methyl-2-Pentanone	1000	4.6 U	4.9 U	NA	4.2 U	4.8 U	0.81 U	0.81 U	0.83 U	0.96 U
Toluene	1500	1.3 U	1.3 U	NA	1.2 U	1.3 U	0.71 U	0.71 U	4.2 U	4.8 U
t-1,3-Dichloropropene	NE	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.66 U	0.66 U	1.1 U	1.3 U
cis-1,3-Dichloropropene	NE	1.0 U	1.1 U	NA	0.95 U	1.1 U	0.66 U	0.66 U	1.0 U	1.2 U
1,1,2-Trichloroethane	NE	1.3 U	1.3 U	NA	1.2 U	1.3 U	0.62 U	0.62 U	0.94 U	1.1 U
2-Hexanone	NE	5.7 U	6.1 U	NA	5.3 U	6.0 U	0.60 U	0.60 U	1.1 U	1.3 U
Dibromochloromethane	NE	1.0 U	1.1 U	NA	0.95 U	1.1 U	0.66 U	0.66 U	5.2 U	6.0 U
Tetrachloroethene	1400	1.4 U	1.5 U	NA	1.3 U	1.4 U	0.70 U	0.70 U	0.94 U	1.1 U
Chlorobenzene	1700	1.3 U	1.3 U	NA	1.2 U	1.3 U	0.78 U	0.78 U	1.2 U	1.4 U
Ethyl Benzene	5500	1.1 U	25	NA	1.1 U	1.2 U	0.76 U	0.76 U	1.1 U	1.3 U
m/p-Xylenes	1200	3.2 U	19	NA	2.9 U	3.3 U	1.5 U	1.5 U	1.0 U	1.2 U
o-Xylene	1200	1.3 U	13	NA	1.2 U	1.3 U	0.72 U	0.72 U	2.9 U	3.4 U
Styrene	NE	1.6 U	1.7 U	NA	1.5 U	1.7 U	0.92 U	0.92 U	1.1 U	1.3 U
Bromoform	NE	1.3 U	1.3 U	NA	1.2 U	1.3 U	0.49 U	0.49 U	1.5 U	1.7 U
1,1,2,2-Tetrachloroethane	600	1.1 U	1.2 U	NA	1.1 U	1.2 U	0.70 U	0.70 U	1.1 U	1.3 U
Total Confident Conc. VOC	NE	0	68	NA	0	0	0	0	1.0 U	1.2 U
Total TICs	NE	0	0	NA	0	0	0	0	0	0
SVOC-TCL BNA									0	0
Units	ppb or ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/L	ug/L	ug/Kg	ug/Kg
Phenol	30	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
bis(2-Chloroethyl)ether	NE	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U

TABLE 3
Soil Sampling & Analysis Data Summary
Belle Harbor, NY

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor	NYSDEC Recommended Soil Cleanup Objective	4499-MW1-S1 R1789-01 3/12/03 SOIL 1.0	4499-MW1-S2 R1789-02 3/12/03 SOIL 1.0	4499-MW1-S2DL R1789-02DL 3/12/03 SOIL 10.0	4499-MW2-S1 R1789-03 3/12/03 SOIL 1.0	4499-MW2-S2 R1789-04 3/12/03 SOIL 1.0	FIELDBLANK R1789-05 3/12/03 WATER 1.0	TRIPBLANK R1789-06 3/12/03 WATER 1.0	4499-MW3-S1 R1789-07 3/13/03 SOIL 1.0	4499-MW3-S2 R1789-08 3/13/03 SOIL 1.0
2-Chlorophenol	800	41 U	44 U	440 UD	38 U	43 U	1.1 U	NA	37 U	43 U
1,2-Dichlorobenzene	7900	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
1,3-Dichlorobenzene	1600	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
1,4-Dichlorobenzene	8500	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
2-Methylphenol	100	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
2,2-oxybis(1-Chloropropane)	NE	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
3+4-Methylphenols	NE	68 U	71 U	710 UD	62 U	71 U	1.8 U	NA	61 U	71 U
N-Nitroso-di-n-propylamine	NE	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
Hexachloroethane	NE	41 U	44 U	440 UD	38 U	43 U	1.1 U	NA	37 U	43 U
Nitrobenzene	200	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
Isophorone	4400	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
2-Nitrophenol	330	41 U	44 U	440 UD	38 U	43 U	1.1 U	NA	37 U	43 U
2,4-Dimethylphenol	NE	86 U	91 U	910 UD	79 U	90 U	2.3 U	NA	78 U	91 U
bis(2-Chloroethoxy)methane	NE	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
2,4-Dichlorophenol	400	49 U	52 U	520 UD	45 U	51 U	1.3 U	NA	44 U	51 U
1,2,4-Trichlorobenzene	NE	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
Naphthalene	13000	80 J	7200 E	**25000 D**	41 U	47 U	1.2 U	NA	40 U	47 U
4-Chloroaniline	220	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
Hexachlorobutadiene	NE	56 U	60 U	600 UD	52 U	59 U	1.5 U	NA	51 U	59 U
4-Chloro-3-methylphenol	240	41 U	44 U	440 UD	38 U	43 U	1.1 U	NA	37 U	43 U
2-Methylnaphthalene	36400	44 U	8700 E	15000 D	41 U	47 U	1.2 U	NA	40 U	47 U
Hexachlorocyclopentadiene	NE	140 U	150 U	1500 UD	130 U	150 U	3.8 U	NA	130 U	150 U
2,4,6-Trichlorophenol	NE	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
2,4,5-Trichlorophenol	100	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
2-Chloronaphthalene	NE	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
2-Nitroaniline	430	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
Dimethylphthalate	2000	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
Acenaphthylene	41000	300 J	2600	5600 D	41 U	47 U	1.2 U	NA	40 U	47 U
2,6-Dinitrotoluene	1000	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
3-Nitroaniline	500	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
Acenaphthene	50000	44 U	6100 E	14000 D	41 U	47 U	1.0 U	NA	40 U	47 U
4-Nitrophenol	100	41 U	44 U	440 UD	38 U	43 U	1.1 U	NA	37 U	43 U
Dibenzofuran	6200	38 U	1300	1700 JD	35 U	39 U	1.0 U	NA	34 U	39 U
2,4-Dinitrotoluene	NE	41 U	44 U	440 UD	38 U	43 U	1.1 U	NA	37 U	43 U
Diethylphthalate	7100	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
4-Chlorophenyl-phenylether	NE	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
Fluorene	50000	76 J	1500	14000 D	38 U	43 U	1.1 U	NA	37 U	43 U
4-Nitroaniline	NE	90 U	95 U	950 UD	83 U	94 U	2.4 U	NA	82 U	95 U
4,6-Dinitro-2-methylphenol	NE	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
N-Nitrosodiphenylamine	NE	75 U	79 U	790 UD	69 U	79 U	2.0 U	NA	68 U	79 U
4-Bromophenyl-phenylether	NE	49 U	52 U	520 UD	45 U	51 U	1.3 U	NA	44 U	51 U
Hexachlorobenzene	4100	41 U	44 U	440 UD	38 U	43 U	1.1 U	NA	37 U	43 U
Pentachlorophenol	1000	71 U	75 U	750 UD	66 U	75 U	1.9 U	NA	65 U	75 U
Phenanthrene	50000	660	8900 E	30000 D	35 U	39 U	1.0 U	NA	37 J	39 U
Anthracene	50000	150 J	9200 E	8300 D	45 U	51 U	1.3 U	NA	44 U	51 U
Carbazole	NE	15 U	16 U	160 UD	14 U	16 U	0.420 U	NA	14 U	16 U
Di-n-butylphthalate	NE	44 U	47 U	470 UD	41 U	47 U	1.2 U	NA	40 U	47 U
Fluoranthene	50000	1700	3400 E	6800 D	35 U	39 U	1.0 U	NA	62 J	39 U
Pyrene	50000	1700	3600 E	13000 D	35 U	39 U	1.0 U	NA	120 J	39 U

TABLE 3
Soil Sampling & Analysis Data Summary
Belle Harbor, NY

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor	NYSDEC Recommended Soil Cleanup Objective	4499-MW1-S1 R1789-01 3/12/03 SOIL 1.0	4499-MW1-S2 R1789-02 3/12/03 SOIL 1.0	4499-MW1-S2DL R1789-02DL 3/12/03 SOIL 10.0	4499-MW2-S1 R1789-03 3/12/03 SOIL 1.0	4499-MW2-S2 R1789-04 3/12/03 SOIL 1.0	FIELDBLANK R1789-05 3/12/03 WATER 1.0	TRIPBLANK R1789-06 3/12/03 WATER 1.0	4499-MW3-S1 R1789-07 3/13/03 SOIL 1.0	4499-MW3-S2 R1789-08 3/13/03 SOIL 1.0
Butylbenzylphthalate	50000	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
3,3-Dichlorobenzidine	NE	38 U	40 U	400 UD	35 U	39 U	1.0 U	NA	34 U	39 U
Benzo(a)anthracene	224	**830**	**3000**	**3900 JD**	35 U	39 U	1.0 U	NA	34 U	39 U
Chrysene	400	**870**	**2400**	**3600 JD**	35 U	39 U	1.0 U	NA	52 J	39 U
bis(2-Ethylhexyl)phthalate	50000	210 J	40 U	400 UD	55 U	63 U	1.6 U	NA	54 U	63 U
Di-n-octyl phthalate	50000	56 U	60 U	600 UD	35 U	39 U	1.0 U	NA	34 U	39 U
Benzo(b)fluoranthene	1100	850	**2500**	**2100 JD**	52 U	59 U	1.5 U	NA	51 U	59 U
Benzo(k)fluoranthene	1100	530	**1200**	**1300 JD**	35 U	39 U	1.0 U	NA	34 U	39 U
Benzo(a)pyrene	61	**730**	**4000 E**	**2800 JD**	90 U	100 U	2.6 U	NA	88 U	100 U
Indeno(1,2,3-cd)pyrene	3200	76 J	150 J	640 UD	52 U	59 U	1.5 U	NA	51 U	59 U
Dibenz(a,h)anthracene	14	57 U	**140 J**	600 UD	55 U	63 U	1.6 U	NA	54 U	63 U
Benzo(g,h,i)perylene	50000	190 J	430	520 UD	52 U	59 U	1.5 U	NA	51 U	60 U
Total Confident Conc. SVOC	NE	8952	66320	147100	45 U	51 U	1.3 U	NA	52 J	51 U
Total TICs	NE	0	0	0	0	0	0	NA	323	0
					0	0	0	NA	0	0
Metals ICP-TAL										
Units	ppm or mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	ug/L	ug/L	mg/Kg	mg/Kg
Aluminum	SB	5760	278	NA	175	683	18.4 U	NA	236	276
Antimony	SB	1.7 B	0.41 B	NA	0.28 B	0.27 U	3.8 U	NA	0.40 B	0.46 B
Arsenic	7.5 or SB	5.8	0.34 B	NA	2.6	1.2	4.5 U	NA	0.34 B	0.41 B
Barium	300 or SB	125	2.7 B	NA	3.1 B	4.6 B	9.9 U	NA	2.5 B	4.6 B
Beryllium	0.16 or SB	**0.33 B**	0.03 B	NA	0.02 B	0.08 B	0.10 U	NA	0.02 B	0.03 B
Cadmium	1 or SB	0.51 B	0.06 U	NA	0.05 U	0.06 U	0.80 U	NA	0.05 U	0.06 U
Calcium	SB	5040	469 B	NA	842	1410	36.2 U	NA	7740	1670
Chromium	10 or SB	**19.8**	2.4	NA	1.2	4.0	6.5 B	NA	1.3	1.7
Cobalt	30 or SB	6.5	0.42 B	NA	0.30 B	1.5 B	0.71 B	NA	0.35 B	0.44 B
Copper	25 or SB	**71.8**	2.9 B	NA	1.7 B	2.4 B	3.6 U	NA	1.2 B	1.0 B
Iron	2000 or SB	**10100**	485	NA	1010	1330	22.2 U	NA	685	572
Lead	SB	128	3.3	NA	3.8	3.1	3.6 U	NA	1.7	1.2
Magnesium	SB	2560	157 B	NA	164 B	402 B	7.0 U	NA	198 B	197 B
Manganese	SB	337	5.8	NA	6.7	15.2	0.20 U	NA	14.2	8.3
Mercury	0.1	**0.23**	0.01	NA	0.01 U	0.01 U	0.02 U	NA	0.01 U	0.01U
Nickel	13 or SB	**13.7 E**	1.5 BE	NA	0.72 BE	5.4 BE	2.0 U	NA	1.0 BE	0.95 BE
Potassium	SB	1110 E	61.4 BE	NA	86.8 BE	177 BE	27.3 U	NA	64.4 BE	79.0 BE
Selenium	2 or SB	1.9	0.49 B	NA	0.34 U	0.51 B	1.3 U	NA	0.34 U	0.68
Silver	SB	0.43 U	0.45 U	NA	0.38 U	0.44 U	3.7 U	NA	0.39 U	0.45 U
Sodium	SB	45.5 U	48.3 U	NA	70.3 B	106 B	289 B	NA	179 B	97.6 B
Thallium	SB	0.67 U	0.71 U	NA	0.60 U	0.68 U	5.3 U	NA	0.60 U	0.70 U
Vanadium	150 or SB	24.5	1.3 B	NA	3.0 B	3.5 B	1.4 U	NA	1.4 B	1.6 B
Zinc	20 or SB	**143**	15.2	NA	6.6	**34.7**	14.3 B	NA	5.4	4.4
PCBs										
Units	ppb or ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/L	ug/L	ug/Kg	ug/Kg
Aroclor-1016	1000S/10000SS	5.9 U	6.3 U	NA	5.4 U	6.1 U	0.24 U	NA	5.4 U	6.2 U
Aroclor-1221	1000S/10000SS	1.5 U	1.6 U	NA	1.4 U	1.5 U	0.080 U	NA	1.3 U	1.5 U
Aroclor-1232	1000S/10000SS	9.1 U	9.6 U	NA	8.3 U	9.4 U	0.090 U	NA	8.3 U	9.5 U
Aroclor-1242	1000S/10000SS	2.5 U	2.6 U	NA	2.3 U	2.6 U	0.080 U	NA	2.3 U	2.6 U
Aroclor-1248	1000S/10000SS	6.3 U	6.6 U	NA	5.7 U	6.5 U	0.12 U	NA	5.7 U	6.5 U
Aroclor-1254	1000S/10000SS	12 U	13 U	NA	11 U	12 U	0.050 U	NA	11 U	13 U
Aroclor-1260	1000S/10000SS	2.3 U	2.4 U	NA	2.1 U	2.3 U	0.010 U	NA	2.1 U	2.4 U

TABLE 3
Soil Sampling & Analysis Data Summary
Belle Harbor, NY

Sample ID / Lab Sample Number / Sampling Date / Matrix / Dilution Factor	NYSDEC Recommended Soil Cleanup Objective	4499-MW1-S1 R1789-01 3/12/03 SOIL 1.0	4499-MW1-S2 R1789-02 3/12/03 SOIL 1.0	4499-MW1-S2DL R1789-02DL 3/12/03 SOIL 10.0	4499-MW2-S1 R1789-03 3/12/03 SOIL 1.0	4499-MW2-S2 R1789-04 3/12/03 SOIL 1.0	FIELDBLANK R1789-05 3/12/03 WATER 1.0	TRIPBLANK R1789-06 3/12/03 WATER 1.0	4499-MW3-S1 R1789-07 3/13/03 SOIL 1.0	4499-MW3-S2 R1789-08 3/13/03 SOIL 1.0
Pesticide-TCL										
Units	ppb or ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/L	ug/L	ug/Kg	ug/Kg
alpha-BHC	110	1.4 U	1.4 U	NA	1.3 U	1.4 U	0.01 U	NA	1.2 U	1.4 U
beta-BHC	200	0.11 U	0.12 U	NA	0.10 U	0.12 U	0.01 U	NA	0.10 U	0.12 U
delta-BHC	300	0.23 U	0.24 U	NA	0.21 U	0.23 U	0.004 U	NA	0.21 U	0.24 U
gamma-BHC(Lindane)	60	0.11 U	0.12 U	NA	0.10 U	0.12 U	0.009 U	NA	0.10 U	0.12 U
Heptachlor	100	1.1 U	1.2 U	NA	1.0 U	1.2 U	0.007 U	NA	1.0 U	1.2 U
Aldrin	41	0.11 U	0.12 U	NA	0.10 U	0.12 U	0.02 U	NA	0.10 U	0.12 U
Heptachlor epoxide	20	0.34 U	0.36 U	NA	0.31 U	0.35 U	0.008 U	NA	0.31 U	0.36 U
Endosulfan I	900	0.57 U	0.60 U	NA	0.52 U	0.59 U	0.01 U	NA	0.52 U	0.60 U
Dieldrin	44	0.11 U	0.12 U	NA	0.10 U	0.12 U	0.009 U	NA	0.10 U	0.12 U
4,4-DDE	2100	0.23 U	4.6 P	NA	0.21 U	0.23 U	0.005 U	NA	0.21 U	0.24 U
Endrin	100	0.91 U	0.96 U	NA	0.84 U	0.94 U	0.02 U	NA	0.83 U	0.96 U
Endosulfan II	900	0.34 U	0.36 U	NA	0.31 U	0.35 U	0.01 U	NA	0.31 U	0.36 U
4,4-DDD	2900	4.6 P	0.24 U	NA	0.21 U	0.23 U	0.01 U	NA	0.21 U	0.24 U
Endosulfan Sulfate	1000	0.68 U	0.72 U	NA	0.63 U	0.70 U	0.02 U	NA	0.62 U	0.72 U
4,4-DDT	2100	0.23 U	0.24 U	NA	0.21 U	0.23 U	0.01 U	NA	0.21 U	0.24 U
Methoxychlor	10000	0.11 U	0.12 U	NA	0.10 U	0.12 U	0.008 U	NA	0.10 U	0.12 U
Endrin ketone	NE	0.11 U	0.12 U	NA	0.10 U	0.12 U	0.009 U	NA	0.10 U	0.12 U
Endrin aldehyde	NE	0.91 U	0.96 U	NA	0.84 U	0.94 U	0.02 U	NA	0.83 U	0.96 U
alpha-Chlordane	NE	2.2	0.36 U	NA	0.31 U	0.35 U	0.02 U	NA	0.31 U	0.36 U
gamma-Chlordane	540	0.34 U	0.36 U	NA	0.31 U	0.35 U	0.01 U	NA	0.31 U	0.36 U
Toxaphene	NE	3.6 U	3.9 U	NA	3.3 U	3.8 U	0.12 U	NA	3.3 U	3.8 U
Chlordane	540	2.2 U	2.3 U	NA	2.0 U	2.2 U	0.13 U	NA	2.0 U	2.3 U
Cyanide										
Units	ppm or mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	ug/L	ug/L	mg/Kg	mg/Kg
Cyanide	NE	4.910	0.609 U	NA	1.060	0.893	0.010 U	NA	0.522 U	0.605 U

NOTES:

U = The compound was not detected at the indicated concentration.
J = Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concetration given is an approximate value.
B = The reported value was obtained from a reading that was less than the Contracted Required Detection Limit, but greater than or equal to the Intrument Dectection Limit
E = Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.
D = This flag identifies all compounds identified in an analysis at a sedonary dilution factor.
P = For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
Bold = Exceeds NYSDEC TAGM Recommended Soil Cleanup Objectives
SB = Site Background
NA = Not Analyzed
NE = Not Established

S/SS = Surface/Subsurface
ppm or mg/Kg = parts per million
ppb, ug/Kg, or ug/L = parts per billion

TABLE 3
Soil Sampling & Analysis Data Summary
Belle Harbor, NY

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor	NYSDEC Recommended Soil Cleanup Objective	4499-MW7-S1 S2752-01 5/24/2004 SOIL 1.0	4499-MW8-S1 S2752-02 5/24/2004 SOIL 2.0	4499-MW8-S1DL S2752-02DL 5/24/2004 SOIL 10.0	FIELDBLANK S2752-03 5/24/2004 WATER 1.0
SVOC-TCL BNA					
Units	ppb or ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Phenol	30	15 U	29 U	140 UD	0.430 U
bis(2-Chloroethyl)ether	NE	17 U	34 U	170 UD	0.330 U
2-Chlorophenol	800	15 U	30 U	150 UD	0.730 U
1,2-Dichlorobenzene	7900	19 U	38 U	190 UD	0.590 U
1,3-Dichlorobenzene	1600	13 U	25 U	130 UD	1.0 U
1,4-Dichlorobenzene	8500	15 U	29 U	140 UD	0.670 U
2-Methylphenol	100	22 U	44 U	220 UD	1.1 U
2,2-oxybis(1-Chloropropane)	NE	19 U	37 U	190 UD	0.830 U
3+4-Methylphenols	NE	16 U	32 U	160 UD	1.1 U
N-Nitroso-di-n-propylamine	NE	15 U	30 U	150 UD	0.770 U
Hexachloroethane	NE	17 U	33 U	160 UD	0.910 U
Nitrobenzene	200	18 U	35 U	180 UD	0.380 U
Isophorone	4400	13 U	26 U	130 UD	0.480 U
2-Nitrophenol	330	14 U	28 U	140 UD	0.270 U
2,4-Dimethylphenol	NE	19 U	37 U	190 UD	0.460 U
bis(2-Chloroethoxy)methane	NE	16 U	32 U	160 UD	0.440 U
2,4-Dichlorophenol	400	12 U	24 U	120 UD	0.290 U
1,2,4-Trichlorobenzene	NE	10 U	20 U	99 UD	0.410 U
Naphthalene	13000	7.6 U	280 J	75 UD	0.270 U
4-Chloroaniline	220	130 U	260 U	1300 UD	4.1 U
Hexachlorobutadiene	NE	12 U	24 U	120 UD	0.380 U
4-Chloro-3-methylphenol	240	10 U	20 U	100 UD	0.300 U
2-Methylnaphthalene	36400	6.0 U	200 J	60 UD	0.500 U
Hexachlorocyclopentadiene	NE	8.8 U	17 U	87 UD	0.450 U
2,4,6-Trichlorophenol	NE	13 U	25 U	130 UD	0.280 U
2,4,5-Trichlorophenol	100	23 U	46 U	230 UD	0.580 U
2-Chloronaphthalene	NE	7.3 U	14 U	72 UD	0.390 U
2-Nitroaniline	430	13 U	25 U	130 UD	0.300 U
Dimethylphthalate	2000	8.4 U	16 U	82 UD	0.260 U
Acenaphthylene	41000	10 U	960	1000 JD	0.430 U
2,6-Dinitrotoluene	1000	15 U	29 U	150 UD	0.410 U
3-Nitroaniline	500	57 U	110 U	560 UD	1.0 U
Acenaphthene	50000	7.7 U	15 U	76 UD	0.240 U
2,4-Dinitrophenol	200	15 U	30 U	150 UD	0.190 U
4-Nitrophenol	100	34 U	67 U	340 UD	0.940 U
Dibenzofuran	6200	12 U	23 U	110 UD	0.310 U
2,4-Dinitrotoluene	NE	7.0 U	14 U	69 UD	0.340 U
Diethylphthalate	7100	11 U	22 U	110 UD	0.340 U
4-Chlorophenyl-phenylether	NE	8.7 U	17 U	86 UD	0.360 U
Fluorene	50000	10 U	270 J	98 UD	0.170 U
4-Nitroaniline	NE	27 U	54 U	270 UD	0.830 U
4,6-Dinitro-2-methylphenol	NE	20 U	40 U	200 UD	1.4 U
N-Nitrosodiphenylamine	NE	8.9 U	18 U	88 UD	0.280 U
4-Bromophenyl-phenylether	NE	9.2 U	18 U	91 UD	0.170 U
Hexachlorobenzene	4100	6.6 U	13 U	65 UD	0.230 U
Pentachlorophenol	1000	11 U	22 U	110 UD	0.390 U
Phenanthrene	50000	7.8 U	3400	3300 JD	0.270 U
Anthracene	50000	8.4 U	670 J	690 JD	0.160 U
Carbazole	NE	7.7 U	15 U	76 UD	0.310 U
Di-n-butylphthalate	NE	38 J	9.2 U	46 UD	0.098 U
Fluoranthene	50000	4.9 U	4700	4300 D	0.210 U
Pyrene	50000	6.3 U	11000 E	9600 D	0.250 U
Butylbenzylphthalate	50000	12 U	23 U	120 UD	0.300 U
3,3-Dichlorobenzidine	NE	56 U	110 U	550 UD	1.6 U
Benzo(a)anthracene	224	5.3 U	**4200**	**4100 D**	0.220 U
Chrysene	400	11 U	**4800**	**4700 D**	0.380 U
bis(2-Ethylhexyl)phthalate	50000	8.1 U	16 U	79 UD	0.340 U
Di-n-octyl phthalate	50000	8.4 U	16 U	82 UD	0.170 U
Benzo(b)fluoranthene	1100	19 U	**4200**	**3400 D**	0.230 U
Benzo(k)fluoranthene	1100	12 U	**1200**	**1200 JD**	0.380 U

TABLE 3 (Continued)
Soil Sampling & Analysis Data Summary
Belle Harbor, NY

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor	NYSDEC Recommended Soil Cleanup Objective	4499-MW7-S1 S2752-01 5/24/2004 SOIL 1.0	4499-MW8-S1 S2752-02 5/24/2004 SOIL 2.0	4499-MW8-S1DL S2752-02DL 5/24/2004 SOIL 10.0	FIELDBLANK S2752-03 5/24/2004 WATER 1.0
Benzo(a)pyrene	61	6.0 U	**2500**	**2300 JD**	0.450 U
Indeno(1,2,3-cd)pyrene	3200	8.5 U	480 J	84 UD	0.290 U
Dibenz(a,h)anthracene	14	10 U	**280 J**	100 UD	0.290 U
Benzo(g,h,i)perylene	50000	15 U	800	500 JD	0.420 U
Total Confident Conc. SVOC	NE	38	39940	35090	0
Total TICs	NE	0	0	0	0
Metals ICP-TAL					
Units	**ppm or mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
Aluminum	SB	341	428	NA	180 U
Antimony	SB	0.59 U	0.58 U	NA	6.6 U
Arsenic	7.5 or SB	0.31 J	1.0	NA	4.8 U
Barium	300 or SB	2.9 J	42.3	NA	11.0 U
Beryllium	0.16 or SB	0.03 J	0.03 J	NA	1.1 U
Cadmium	1 or SB	0.05 U	0.09 J	NA	0.99 U
Calcium	SB	369 J	480 J	NA	1740 U
Chromium	10 or SB	1.9	2.9	NA	1.2 U
Cobalt	30 or SB	0.48 J	0.50 J	NA	2.4 U
Copper	25 or SB	4.0	5.9	NA	0.74 U
Iron	2000 or SB	573	**2870**	NA	29.0 U
Lead	SB	13.5	32.9	NA	1.8 U
Magnesium	SB	137 J	191 J	NA	254 U
Manganese	SB	17.7	16.2	NA	0.51 J
Mercury	0.1	0.01	0.02	NA	0.11 J
Nickel	13 or SB	0.73 J	1.4 J	NA	5.5 U
Potassium	SB	50.9 J	128 J	NA	51.0 U
Selenium	2 or SB	0.47 J	0.32 U	NA	5.2 U
Silver	SB	0.11 U	0.11 U	NA	3.4 U
Sodium	SB	66.8 J	86.6 J	NA	189 U
Thallium	SB	0.35 U	0.34 U	NA	5.8 U
Vanadium	150 or SB	1.7 J	3.7 J	NA	2.8 J
Zinc	20 or SB	**21.2**	**20.7**	NA	8.1 U
Cyanide					
Units	**ppm or mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
Cyanide	NE	2.22	11.12	NA	0.01 U

NOTES:

U = The compound was not detected at the indicated concentration.
J = Data indicates the presence of a compound that meets the identification criteria.
The result is less than the quantitation limit but greater than zero.The concetration given is an approximate value.
B = The reported value was obtained from a reading that was less than the Contracted Required Detection Limit,
but greater than or equal to the Intrument Dectection Limit
E = Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.
D = This flag identifies all compounds identified in an analysis at a sedonary dilution factor.
Bold = Exceeds NYSDEC TAGM Recommended Soil Cleanup Objectives
SB = Site Background
NA = Not Analyzed
NE = Not Established

TABLE 7
HISTORIC GROUNDWATER SAMPLING RESULTS
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), Queens County, New York

Monitor Well No.	Compounds Exceeding NYSDEC GW Standards/Criteria	3/31/03 Concentration (ppb)	6/9/04 Concentration (ppb)	8/15-16/07 Concentration (ppb)	6/11/08 Concentration (ppb)	7/15/08 Concentration (ppb)	10/16/08 Concentration (ppb)
MW-1	Benzene	350JD	92	47	NS	98	250
	Toluene	4,000D	2,100D	520		2,500D	2,600
	Ethyl benzene	1,300D	2,200D	1,300		2,400D	3,100
	Xylene	3,400D	4,200D	910		2,600D	2,600
	1,2,4 Trimethylbenzene	NA	NA	440		NA	NA
	1,3,5 Trimethylbenzene	NA	NA	120		NA	NA
	4-Isopropyltoluene	NA	NA	14		NA	NA
	Isopropylbenzene	NA	NA	120		88	120
	n-Propylbenzene	NA	NA	22		NA	NA
	Styrene	ND	ND	ND		780D	390
	Acenaphthene	38	58	230		280	350D
	Dibenzofuran	9.1J	18	ND		38J	16
	Fluorene	56	73D	130		230	90
	Phenanthrene	54	80D	240		380	87
	Benzo(a)anthracene	1.1J	6.2J	ND		34J	ND
	Naphthalene	7,400D	7,200D	6,400		9,600D	13,000D
	2-Methylnaphthalene	780D	980D	840		1,600	2,000D
	Acenaphthylene	280D	250D	ND		360	120
	Chrysene	ND	6.0J	ND		55J	ND
	Benzo(b)fluoranthene	ND	3.1J	ND		ND	ND
	Benzo(a)pyrene	ND	4.8J	ND		ND	ND
	Indeno(1,2,3-cd)pyrene	ND	1.2J	ND		ND	ND
	Fluoranthene	ND	ND	ND		57J	ND
	Pyrene	ND	ND	ND		150	ND
	Anthracene	ND	ND	ND		72J	ND
MW-2	Vinyl chloride	11	ND	1.2*	NS	NS	ND
	Benzene	1.6	ND	3.1			2.3
	Trichloroethene	6.4	ND	ND			ND
	Xylene	8.4	ND	ND			ND
	Acenaphthene	53	12*	ND			120

TABLE 7 (continued)
HISTORIC GROUNDWATER SAMPLING RESULTS
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), Queens County, New York

Monitor Well No.	Compounds Exceeding NYSDEC GW Standards/Criteria	3/31/03 Concentration (ppb)	6/9/04 Concentration (ppb)	8/15-16/07 Concentration (ppb)	6/11/08 Concentration (ppb)	7/15/08 Concentration (ppb)	10/16/08 Concentration (ppb)
MW-2D	ND	NI	ND	ND	NS	NS	ND
MW-3	ND	ND	ND	ND	NS	NS	ND
MW-4	Tetrachloroethene	290D	1,300D	1,800	1,600	1,000D	460
	Trichloroethene	80	32	35	40	21	66
	Vinyl chloride	ND	ND	ND	ND	ND	18
	Ethyl benzene	81	ND	ND	ND	ND	ND
	Xylene	106	278	ND	170	97	45
	1,3,5 Trimethylbenzene	NA	NA	31	51	NA	NA
	1,2,4 Trimethylbenzene	NA	NA	48	140	NA	NA
	cis-1,2-Dichloroethene	76	240	330	180	63	350
	Naphthalene	52	190D	ND	NA	ND	2,100D
	Acenaphthylene	40	63	1.5*	NA	210	240
	Trans-1,2-Dichloroethene	3.9J*	7.3	ND	NA	ND	ND
	Benzo(a)anthracene	ND	1.9J	ND	NA	ND	ND
	Chrysene	ND	1.9J	ND	NA	ND	ND
	Benzo(b)fluoranthene	ND	2.0J	ND	NA	ND	ND
	Benzo(a)pyrene	ND	2.0J	ND	NA	ND	ND
	Dibenzofuran	ND	ND	ND	NA	7J	8J
	2-Methylnaphthalene	ND	ND	ND	NA	ND	440

TABLE 7 (continued)
HISTORIC GROUNDWATER SAMPLING RESULTS
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), Queens County, New York

Monitor Well No.	Compounds Exceeding NYSDEC GW Standards/Criteria	3/31/03 Concentration (ppb)	6/9/04 Concentration (ppb)	8/15-16/07 Concentration (ppb)	6/11/08 Concentration (ppb)	7/15/08 Concentration (ppb)	10/16/08 Concentration (ppb)
MW-4D	Tetrachloroethene	NI	12	ND	ND	ND	ND
	Xylene		12	1,570	207	ND	210D
	1,2,4 Trimethylbenzene		NA	530	76	NA	NA
	1,3,5 Trimethylbenzene		NA	200	26	NA	NA
	Ethyl benzene		0.71J*	490	78	ND	140J
	Styrene		3.9J*	950	130	ND	34D
	Toluene		ND	37	6.4	ND	5.4D
	cis-1,2- Dichloroethene		5.9	ND	ND	ND	ND
	Benzo(b)fluoranthene		1.1J	ND	NA	28J	ND
	Benzo(a)pyrene		1.2J	ND	NA	41J	ND
	2-4-Dimethylphenol		ND	41	NA	ND	ND
	2-Methylnaphthalene		ND	ND	NA	2,500	760
	Acenaphthylene		ND	ND	NA	430J	280
	Naphthalene		ND	ND	NA	13,000	3,900
	MTBE		ND	ND	ND	ND	200D
	Acenaphthene		ND	ND	NA	360J	ND
	Anthracene		ND	ND	NA	120J	ND
	Benzo(a)anthracene		ND	ND	NA	73J	ND
	Benzo(k)fluoranthene		ND	ND	NA	16J	ND
	4-Chloroaniline		ND	ND	NA	3,900	ND
	Chrysene		ND	ND	NA	120J	ND
	Dibenzofuran		ND	ND	NA	56J	ND
	Fluoranthene		ND	ND	NA	120J	ND
	Fluorene		ND	ND	NA	340J	ND
	Phenanthene		ND	ND	NA	580	ND
	Pyrene		ND	ND	NA	150J	ND
MW-5	Acenaphthene	ND	ND	ND	NS	NS	24

TABLE 7 (continued)
HISTORIC GROUNDWATER SAMPLING RESULTS
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), Queens County, New York

Monitor Well No.	Compounds Exceeding NYSDEC GW Standards/Criteria	3/31/03 Concentration (ppb)	6/9/04 Concentration (ppb)	8/15-16/07 Concentration (ppb)	6/11/08 Concentration (ppb)	7/15/08 Concentration (ppb)	10/16/08 Concentration (ppb)
MW-6	Ethyl benzene	30	10	65	NS	NS	170
	Xylene	22.6	7.2	37.9			63
	1,2,4 Trimethylbenzene	NA	NA	27			NA
	Isopropylbenzene	NA	NA	8.6			20
	Naphthalene	96D	ND	ND			ND
	Acenaphthene	8.7*	23	55			61
MW-7	ND	NI	ND	ND	NS	NS	ND
MW-8S	ND	NI	ND	ND	NS	NS	ND
MW-8D	ND	NI	ND	ND	NS	NS	ND

Notes:
GW Groundwater
ppb parts per billion
J Estimated concentration below Method Detection Limit and greater than zero.
D Diluted
ND None detected
NI Well not installed
NA Not Analyzed
* Concentration is below NYSDEC GW Standards/Criteria

TABLE 2 HISTORIC SOIL GAS VAPOR AND INDOOR AIR QUALITY SAMPLING & DATA ANALYSES SUMMARY Belle Harbor Shopping Center 112-15 Beach Channel Drive Queens (Far Rockaway), Queens County, New York						
Sample #	**Date Sampled**	**Total Depth (feet)**	**Depth to GW (fbgs)**	**Soil Interval Sampled (fbgs)**	**Analyses**	**Detected Compound/ Concentration ug/m³**
SV-1	6-16-04	2.0	NE	1.5 to 2.0	V	Acetone - 1,600 Carbon disulfide - 250 Dichlorodifluoromethane - 690 Tetrachloroethene - 3,800 Toluene - 250 Trichloroethene - 300
SV-2	6-16-04	2.0	NE	1.5 to 2.0	V	Acetone - 2,100 Carbon disulfide - 260 Dichlorodifluoromethane - 940 Tetrachloroethene - 14,000 Toluene - 330 Trichloroethene - 440
SV-3	6-16-04	2.0	NE	1.5 to 2.0	V	Acetone - 5,900 Carbon disulfide - 840 Dichlorodifluoromethane - 1,700 Tetrachloroethene - 160,000D Toluene - 1,100
SV-4	6-16-04	2.0	NE	1.5 to 2.0	V	Acetone - 1,100 Carbon disulfide - 130 Tetrachloroethene - 14,000 Toluene - 170
AA-1*	6-16-04	NA	NA	NA	V	Acetone - 43 2-Butanone - 3.5 Choloromethane - 1.5 Dichlorodifluoromethane - 3.1 Ethyl benzene - 2.3 n-hexane - 3.0 MTBE - 2.2 Tetrachloroethene - 14 Toluene - 10 1,2,4 Trimethylbenzene - 2.5 2,2,4-Trimethylpentane - 2.7 Xylene (m&p) - 5.6
SG-1	6-11-08	2.0	NE	1.5 to 2.0	V	Dichlorodifluoromethane - 1,700 Benzene - 13 Trichloroethene - 32 Toluene - 11 Tetrachloroethene - 210

TABLE 2 (continued)
HISTORIC SOIL GAS VAPOR AND INDOOR AIR QUALITY SAMPLING & DATA ANALYSES SUMMARY
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), Queens County, New York

Sample #	Date Sampled	Total Depth (feet)	Depth to GW (fbgs)	Soil Interval Sampled (fbgs)	Analyses	Detected Compound/ Concentration ug/m^3
SG-2	6-11-08	2.0	NE	1.5 to 2.0	V	1,3-Butadiene -2.7 Tricloroflurormethane - 1.9 Cyclohexane - 1.0 Benzene - 6.1 Toluene - 6.4 Tetrachloroethene - 2.6 Ethyl Benzene - 1.3 Xylenes - 7.8 4-Ethyltoluene - 3.9 1,3,5-Trimethylbenzene - 1.6
SG-3	6-11-08	2.0	NE	1.5 to 2.0	V	Ethyl Benzene - 39
SG-4	6-11-08	2.0	NE	1.5 to 2.0	V	Tricloroflurormethane - 1.8 Cyclohexane - 0.96 Benzene - 2.1 n-Heptane - 1.5 Toluene - 25 Tetrachloroethene - 6.4 Ethyl Benzene - 1.4 Xylenes - 9.1 4-Ethyltoluene - 3.2 1,3,5-Trimethylbenzene - 1.6
SG-5	6-11-08	2.0	NE	1.5 to 2.0	V	Dichlorodifluoromethane - 4.7 1,3-Butadiene -1.5 Tricloroflurormethane - 1.6 –Hexane - 1.8 Cyclohexane - 1.2 2,2,4-Trimethypentane - 2.0 Benzene - 2.5 n-Heptane - 3.7 Toluene - 29 Tetrachloroethene - 18 Ethyl Benzene - 4.0 Xylenes - 16 4-Ethyltoluene - 4.4 1,3,5-Trimethylbenzene - 0.98
SG-6	6-11-08	2.0	NE	1.5 to 2.0	V	Tricloroflurormethane - 2.6 Chloroform - 2.2 Cyclohexane - 1.4 Benzene - 2.0 Toluene - 2.4 Tetrachloroethene - 4.5 4-Ethyltoluene - 1.0

TABLE 2 (continued)
HISTORIC SOIL GAS VAPOR AND INDOOR AIR QUALITY SAMPLING & DATA ANALYSES SUMMARY
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), Queens County, New York

Sample #	Date Sampled	Total Depth (feet)	Depth to GW (fbgs)	Soil Interval Sampled (fbgs)	Analyses	Detected Compound/ Concentration ug/m^3
IAQ-1	6-12-08	NA	NA	NA	V	Dichlorodifluoromethane - 7.4 Triclorofluoromethane - 4.7 Toluene - 6.0 Tetrachloroethene - 310
IAQ-2	6-12-08	NA	NA	NA	V	Dichlorodifluoromethane - 3.2 Triclorofluoromethane - 0.96 n-Hexane - 2.3 Chloroform - 0.22 Cyclohexane - 0.48 Carbon Tetrachloride - 0.38 2,2,4-Trimethypentane - 2.5 Benzene - 0.83 n-Heptane - 1.2 Toluene - 3.8 Tetrachloroethene - 6.8 Ethyl Benzene - 0.69 Xylenes - 3.0 4-Ethyltoluene - 0.64
IAQ-3	6-12-08	NA	NA	NA	V	Dichlorodifluoromethane - 4.1 1,3-Butadiene -0.55 Triclorofluoromethane - 1.3 n-Hexane - 2.9 Chloroform - 1.5 Cyclohexane - 0.41 Carbon Tetrachloride - 0.42 2,2,4-Trimethypentane - 0.84 Benzene - 2.4 n-Heptane - 1.0 Trichloroethene - 0.39 Toluene - 3.2 Tetrachloroethene - 15 Ethyl Benzene - 0.43 Xylenes - 1.7 4-Ethyltoluene - 0.59

Notes:
NE Not encountered
NA Not applicable
fbgs feet below ground surface
V Volatile organic compounds by TO-15
ug/m^3 micrograms per cubic meter
* Ambient air sample

APPENDIX B

GEI Soil, Groundwater, and Vapor Analytical Tables

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	**B-103**	**B-103**	**B-103**	**B-104**	**B-104**	**B-104**	**B-105**	**B-105**	**B-105**
				Sample Name	**B-103 (5-7)**	**B-103 (10-12)**	**B-103 (21-23)**	**B-104 (7-8)**	**B-104 (9-10)**	**B-104 (38-40)**	**B-105 (8-10)**	**B-105 (12-14)**	**B-105 (36-40)**
				Start Depth	**5**	**10**	**21**	**7**	**9**	**38**	**8**	**12**	**36**
				End Depth	**7**	**12**	**23**	**8**	**10**	**40**	**10**	**14**	**40**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/18/2012**	**5/18/2012**	**5/18/2012**	**5/16/2012**	**5/16/2012**	**5/16/2012**	**5/17/2012**	**5/17/2012**	**5/17/2012**
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
BTEX	mg/kg												
Benzene		71-43-2	0.06	44	0.0011 U	**0.00029 J**	0.0011 U	**0.00024 J**	**0.15 J**	0.11 U	0.0011 U	0.0011 U	0.0012 U
Toluene		108-88-3	0.7	500	0.0011 U	**0.0011**	**0.0002 J**	0.0012 U	**0.26**	0.11 U	0.0011 U	**0.00021 J**	0.0012 U
Ethylbenzene		100-41-4	1	390	0.0011 U	**0.02**	0.0011 U	0.0012 U	**1.5**	0.11 U	0.0011 U	0.0011 U	0.0012 U
Total Xylene		1330-20-7	1.6	500	0.0033 U	**0.022**	0.0034 U	0.0035 U	**2.4**	0.34 U	0.0033 U	0.0033 U	0.0035 U
Total BTEX (ND=0)		TBTEX_ND0	NE	NE	ND	**0.04339**	**0.0002**	**0.00024**	**4.31**	ND	ND	**0.00021**	ND
Other VOCs	mg/kg												
Acetone		67-64-1	0.05	500	0.011 U	0.025 U	0.026 U	0.021 U	1 U	**47**	0.044 U	0.037 U	0.032 U
Bromodichloromethane		75-27-4	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Bromoform		75-25-2	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Bromomethane		74-83-9	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Carbon disulfide		75-15-0	NE	NE	0.0011 U	**0.0016**	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	**0.00044 J**
Carbon tetrachloride		56-23-5	0.76	22	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Chlorobenzene		108-90-7	1.1	500	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Chloroethane		75-00-3	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Chloroform		67-66-3	0.37	350	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Chloromethane		74-87-3	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Dibromochloromethane		124-48-1	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
1,1-Dichloroethane		75-34-3	0.27	240	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
1,2-Dichloroethane		107-06-2	0.02	30	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
1,1-Dichloroethene		75-35-4	0.33	500	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
cis-1,2-Dichloroethene		156-59-2	0.25	500	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
trans-1,2-Dichloroethene		156-60-5	0.19	500	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
1,2-Dichloropropane		78-87-5	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
cis-1,3-Dichloropropene		10061-01-5	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
trans-1,3-Dichloropropene		10061-02-6	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
2-Hexanone		591-78-6	NE	NE	0.011 U	0.011 U	0.011 U	0.012 U	1 U	0.56 U	0.011 U	0.011 U	0.012 U
Methyl ethyl ketone (2-Butanone)		78-93-3	0.12	500	0.011 U	**0.0034 J**	0.011 U	0.012 U	1 U	0.56 U	0.011 U	0.011 U	0.012 U
4-Methyl-2-pentanone (MIBK)		108-10-1	NE	NE	0.011 U	0.011 U	0.011 U	0.012 U	1 U	0.56 U	0.011 U	0.011 U	0.012 U
Methylene chloride		75-09-2	0.05	500	**0.0047**	**0.0025**	**0.015**	0.0045 U	0.2 U	1.2 U	0.013 U	0.013 U	0.006 U
Styrene		100-42-5	NE	NE	0.0011 U	**0.00057 J**	0.0011 U	0.0012 U	**0.064 J**	0.11 U	0.0011 U	0.0011 U	0.0012 U
1,1,2,2-Tetrachloroethane		79-34-5	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Tetrachloroethene (PCE)		127-18-4	1.3	150	0.0011 U	0.0011 U	0.0011 U	**0.0008 J**	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
1,1,1-Trichloroethane (TCA)		71-55-6	0.68	500	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
1,1,2-Trichloroethane		79-00-5	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Trichloroethene (TCE)		79-01-6	0.47	0.4700	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Vinyl chloride		75-01-4	0.02	0.02000	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.2 U	0.11 U	0.0011 U	0.0011 U	0.0012 U
Total VOCs (ND=0)		TVOC_ND0	NE	NE	**0.0047**	**0.05146**	**0.0152**	**0.00104**	**4.374**	**47**	ND	**0.00021**	**0.00044**

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	B-103	B-103	B-103	B-104	B-104	B-104	B-105	B-105	B-105
				Sample Name	B-103 (5-7)	B-103 (10-12)	B-103 (21-23)	B-104 (7-8)	B-104 (9-10)	B-104 (38-40)	B-105 (8-10)	B-105 (12-14)	B-105 (36-40)
				Start Depth	5	10	21	7	9	38	8	12	36
				End Depth	7	12	23	8	10	40	10	14	40
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/18/2012	5/18/2012	5/18/2012	5/16/2012	5/16/2012	5/16/2012	5/17/2012	5/17/2012	5/17/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
PAH17	mg/kg												
Acenaphthene		83-32-9	98	20.00	0.4 U	0.39 U	0.4 U	0.4 U	**45**	0.41 U	0.39 U	0.39 U	0.4 U
Acenaphthylene		208-96-8	107	100.0	0.4 U	0.39 U	0.4 U	**0.11 J**	**6.1 J**	0.41 U	0.39 U	0.39 U	0.4 U
Anthracene		120-12-7	1000	100.0	0.4 U	0.39 U	0.4 U	**0.066 J**	**33**	0.41 U	0.39 U	0.39 U	0.4 U
Benzo(a)anthracene		56-55-3	1	1.000	**0.028 J**	0.039 U	0.04 U	**0.32**	**16**	0.041 U	0.039 U	0.039 U	0.04 U
Benzo(b)fluoranthene		205-99-2	1.7	1.000	0.04 U	0.039 U	0.04 U	**0.29**	**6.6**	0.041 U	0.039 U	0.039 U	0.04 U
Benzo(k)fluoranthene		207-08-9	1.7	0.8000	0.04 U	0.039 U	0.04 U	**0.085**	**3.1**	0.041 U	0.039 U	0.039 U	0.04 U
Benzo(g,h,i)perylene		191-24-2	1000	100.0	0.4 U	0.39 U	0.4 U	**0.23 J**	**5.2 J**	0.41 U	0.39 U	0.39 U	0.4 U
Benzo(a)pyrene		50-32-8	22	1.000	0.04 U	0.039 U	0.04 U	**0.42**	**12**	0.041 U	0.039 U	0.039 U	0.04 U
Chrysene		218-01-9	1	1.000	0.4 U	0.39 U	0.4 U	**0.35 J**	**16**	0.41 U	0.39 U	0.39 U	0.4 U
Dibenz(a,h)anthracene		53-70-3	1000	0.3300	0.04 U	0.039 U	0.04 U	**0.038 J**	**1.3**	0.041 U	0.039 U	0.039 U	0.04 U
Fluoranthene		206-44-0	1000	100.0	0.4 U	**0.062 J**	0.4 U	**0.28 J**	**32**	0.41 U	0.39 U	0.39 U	0.4 U
Fluorene		86-73-7	386	30.00	0.4 U	0.39 U	0.4 U	0.4 U	**38**	0.41 U	0.39 U	0.39 U	0.4 U
Indeno(1,2,3-cd)pyrene		193-39-5	8.2	0.5000	0.04 U	0.039 U	0.04 U	**0.2**	**4.1**	0.041 U	0.039 U	0.039 U	0.04 U
2-Methylnaphthalene		91-57-6	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	**4.2 J**	0.41 U	0.39 U	0.39 U	0.4 U
Naphthalene		91-20-3	12	12.00	0.4 U	0.39 U	0.4 U	0.4 U	**4 J**	0.41 U	0.39 U	0.39 U	0.4 U
Phenanthrene		85-01-8	1000	100.0	0.4 U	**0.18 J**	0.4 U	**0.068 J**	**120**	0.41 U	0.39 U	0.39 U	0.4 U
Pyrene		129-00-0	1000	100.0	**0.042 J**	**0.07 J**	0.4 U	**0.47**	**48**	0.41 U	0.39 U	0.39 U	0.4 U
Total PAH (17) (ND=0)		TPAH17_ND0	NE	NE	**0.07**	**0.312**	ND	**2.927**	**394.6**	ND	ND	ND	ND
PAH17 Other SVOCs	mg/kg												
Bis(2-chloroethoxy)methane		111-91-1	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Bis(2-chloroethyl)ether		111-44-4	NE	NE	0.04 U	0.039 U	0.04 U	0.04 U	0.79 U	0.041 U	0.039 U	0.039 U	0.04 U
Bis(chloroisopropyl)ether		108-60-1	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Bis(2-ethylhexyl)phthalate		117-81-7	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
4-Bromophenyl phenyl ether		101-55-3	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Butyl benzyl phthalate		85-68-7	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Carbazole		86-74-8	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
4-Chloro-3-methylphenol		59-50-7	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
4-Chloroaniline		106-47-8	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
2-Chloronaphthalene		91-58-7	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
2-Chlorophenol		95-57-8	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
4-Chlorophenyl phenyl ether		7005-72-3	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Dibenzofuran		132-64-9	210	7.000	0.4 U	0.39 U	0.4 U	0.4 U	**4.6 J**	0.41 U	0.39 U	0.39 U	0.4 U
1,2-Dichlorobenzene		95-50-1	1.1	1.100	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
1,3-Dichlorobenzene		541-73-1	2.4	2.400	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
1,4-Dichlorobenzene		106-46-7	1.8	1.800	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
3,3-Dichlorobenzidine		91-94-1	NE	NE	0.8 U	0.79 U	0.81 U	0.82 U	16 U	0.84 U	0.79 U	0.8 U	0.82 U
2,4-Dichlorophenol		120-83-2	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U

				Location Name	B-103	B-103	B-103	B-104	B-104	B-104	B-105	B-105	B-105
				Sample Name	B-103 (5-7)	B-103 (10-12)	B-103 (21-23)	B-104 (7-8)	B-104 (9-10)	B-104 (38-40)	B-105 (8-10)	B-105 (12-14)	B-105 (36-40)
				Start Depth	5	10	21	7	9	38	8	12	36
				End Depth	7	12	23	8	10	40	10	14	40
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/18/2012	5/18/2012	5/18/2012	5/16/2012	5/16/2012	5/16/2012	5/17/2012	5/17/2012	5/17/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Diethyl phthalate		84-66-2	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Dimethyl phthalate		131-11-3	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
2,4-Dimethylphenol		105-67-9	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Di-n-butyl phthalate		84-74-2	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
4,6-Dinitro-2-methylphenol		534-52-1	NE	NE	1.2 U	1.2 U	1.2 U	1.2 U	24 U	1.3 U	1.2 U	1.2 U	1.2 U
2,4-Dinitrophenol		51-28-5	NE	NE	1.2 U	1.2 U	1.2 U	1.2 U	24 U	1.3 U	1.2 U	1.2 U	1.2 U
2,4-Dinitrotoluene		121-14-2	NE	NE	0.08 U	0.079 U	0.081 U	0.082 U	1.6 U	0.084 U	0.079 U	0.08 U	0.082 U
2,6-Dinitrotoluene		606-20-2	NE	NE	0.08 U	0.079 U	0.081 U	0.082 U	1.6 U	0.084 U	0.079 U	0.08 U	0.082 U
Di-n-octyl phthalate		117-84-0	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Hexachlorobenzene		118-74-1	3.2	0.3300	0.04 U	0.039 U	0.04 U	0.04 U	0.79 U	0.041 U	0.039 U	0.039 U	0.04 U
Hexachlorobutadiene (C-46)		87-68-3	NE	NE	0.08 U	0.079 U	0.081 U	0.082 U	1.6 U	0.084 U	0.079 U	0.08 U	0.082 U
Hexachlorocyclopentadiene		77-47-4	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Hexachloroethane		67-72-1	NE	NE	0.04 U	0.039 U	0.04 U	0.04 U	0.79 U	0.041 U	0.039 U	0.039 U	0.04 U
Isophorone		78-59-1	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
2-Methylphenol (o-Cresol)		95-48-7	0.33	0.3300	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
4-Methylphenol (p-Cresol)		106-44-5	0.33	0.3300	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
2-Nitroaniline		88-74-4	NE	NE	0.8 U	0.79 U	0.81 U	0.82 U	16 U	0.84 U	0.79 U	0.8 U	0.82 U
3-Nitroaniline		99-09-2	NE	NE	0.8 U	0.79 U	0.81 U	0.82 U	16 U	0.84 U	0.79 U	0.8 U	0.82 U
4-Nitroaniline		100-01-6	NE	NE	0.8 U	0.79 U	0.81 U	0.82 U	16 U	0.84 U	0.79 U	0.8 U	0.82 U
Nitrobenzene		98-95-3	NE	NE	0.04 U	0.039 U	0.04 U	0.04 U	0.79 U	0.041 U	0.039 U	0.039 U	0.04 U
2-Nitrophenol		88-75-5	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
4-Nitrophenol		100-02-7	NE	NE	1.2 U	1.2 U	1.2 U	1.2 U	24 U	1.3 U	1.2 U	1.2 U	1.2 U
N-Nitrosodiphenylamine (NDFA)		86-30-6	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
N-Nitrosodi-n-propylamine (NDPA)		621-64-7	NE	NE	0.04 U	0.039 U	0.04 U	0.04 U	0.79 U	0.041 U	0.039 U	0.039 U	0.04 U
Pentachlorophenol		87-86-5	0.8	0.8000	1.2 U	1.2 U	1.2 U	1.2 U	24 U	1.3 U	1.2 U	1.2 U	1.2 U
Phenol		108-95-2	0.33	0.3300	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
1,2,4-Trichlorobenzene		120-82-1	NE	NE	0.04 U	0.039 U	0.04 U	0.04 U	0.79 U	0.041 U	0.039 U	0.039 U	0.04 U
2,4,5-Trichlorophenol		95-95-4	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
2,4,6-Trichlorophenol		88-06-2	NE	NE	0.4 U	0.39 U	0.4 U	0.4 U	7.9 U	0.41 U	0.39 U	0.39 U	0.4 U
Total SVOCs (ND=0)		TSVOC_ND0	NE	NE	**0.07**	**0.312**	ND	**2.927**	**399.2**	ND	ND	ND	ND
Total Metals	mg/kg												
Aluminum		7429-90-5	NE	NE	**74.5 J**	**284 J**	**328 J**	**576 J**	**863 J**	**251 J**	**216 J**	**251 J**	**244 J**
Antimony		7440-36-0	NE	NE	2.3 U	2.3 U	2.3 U	2.4 U	2.3 U	2.4 U	2.2 U	2.1 U	2.3 U
Arsenic		7440-38-2	16	13.00	1.2 U	1.1 U	1.1 U	1.2 U	**1.7**	1.2 U	1.1 U	1.1 U	1.1 U
Barium		7440-39-3	820	350.0	**2.5 J**	**1.7 J**	45.1 U	**6.3 J**	**25.1 J**	48.2 U	**2.5 J**	**1.7 J**	45.4 U
Beryllium		7440-41-7	47	7.200	0.46 U	0.45 U	0.45 U	0.48 U	0.46 U	0.48 U	0.44 U	0.43 U	0.45 U
Cadmium		7440-43-9	7.5	2.500	1.2 U	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.1 U	1.1 U
Calcium		7440-70-2	NE	NE	1150 U	**105 J**	**5110**	**324 J**	**514 J**	**255 J**	**165 J**	**121 J**	**4650 J**

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Analyte	Units	CAS No.	Protection of Groundwater SCO	Commercial SCO	B-103	B-103	B-103	B-104	B-104	B-104	B-105	B-105	B-105
				Sample Name	B-103 (5-7)	B-103 (10-12)	B-103 (21-23)	B-104 (7-8)	B-104 (9-10)	B-104 (38-40)	B-105 (8-10)	B-105 (12-14)	B-105 (36-40)
				Start Depth	5	10	21	7	9	38	8	12	36
				End Depth	7	12	23	8	10	40	10	14	40
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/18/2012	5/18/2012	5/18/2012	5/16/2012	5/16/2012	5/16/2012	5/17/2012	5/17/2012	5/17/2012
				Parent Sample									
Chromium		7440-47-3	NE	NE	2.3 U	**2.3**	**2.7**	**2.3 J**	**3.6**	**1.1 J**	**1.6 J**	**1.3 J**	2.3 U
Cobalt		7440-48-4	NE	NE	11.5 U	11.3 U	11.3 U	12 U	**1.5 J**	12 U	11 U	10.7 U	11.4 U
Copper		7440-50-8	1720	50.00	5.8 U	5.6 U	5.6 U	6 U	**19.9**	6 U	5.5 U	5.3 U	5.7 U
Iron		7439-89-6	NE	NE	**538**	**610**	**816**	**1720**	**4540**	**559**	**523**	**602**	**726**
Lead		7439-92-1	450	63.00	**6.5**	**9.4**	1.1 U	**3.9**	**67.8**	1.2 U	**4.6**	**1.2**	1.1 U
Magnesium		7439-95-4	NE	NE	1150 U	**101 J**	**82.2 J**	**314 J**	**284 J**	**109 J**	**87.1 J**	**106 J**	**139 J**
Manganese		7439-96-5	2000	1600	**2 J**	**4.9**	**4.8**	**10.5**	**17.6**	**5.9**	**6.8**	**5.4**	**8.4**
Mercury		7439-97-6	0.73	0.1800	0.038 U	**0.027 J**	0.04 U	0.038 U	**0.051**	0.041 U	0.038 U	0.038 U	0.04 U
Nickel		7440-02-0	130	30.00	9.2 U	9 U	**1 J**	**1.4 J**	**4.8 J**	9.6 U	8.8 U	8.5 U	9.1 U
Potassium		7440-09-7	NE	NE	1150 U	1130 U	1130 U	**216 J**	1140 U	1200 U	1100 U	1070 U	1140 U
Selenium		7782-49-2	4	3.900	2.3 U	2.3 U	2.3 U	2.4 U	2.3 U	2.4 U	2.2 U	2.1 U	2.3 U
Silver		7440-22-4	8.3	2.000	2.3 U	2.3 U	2.3 U	2.4 U	2.3 U	2.4 U	2.2 U	2.1 U	2.3 U
Sodium		7440-23-5	NE	NE	1150 U	1130 U	1130 U	1200 U	1140 U	1200 U	1100 U	1070 U	1140 U
Thallium		7440-28-0	NE	NE	2.3 U	2.3 U	2.3 U	2.4 U	2.3 U	2.4 U	2.2 U	2.1 U	2.3 U
Vanadium		7440-62-2	NE	NE	11.5 U	**1.5 J**	**1.1 J**	**2.8 J**	**4.5 J**	**0.99 J**	**1.1 J**	**1.4 J**	**1.1 J**
Zinc		7440-66-6	2480	109.0	6.9 U	**2.6 J**	**11**	**8.5**	**46.2**	**1.6 J**	**11.2**	**3.8 J**	**1.5 J**
Cyanides	mg/kg												
Free Cyanide		FREECN	NE	NE	**2**	**0.54**	**0.13 J**	0.53 UJ	0.52 UJ	0.52 UJ	**0.24 J**	**0.13 J**	**1.1 J**
Total Cyanide		57-12-5	40	27.00	**9.8**	**0.48 J**	0.61 U	**0.47 J**	**0.2 J**	0.63 UJ	**0.24 J**	**1.1**	0.61 U

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				Location Name	**B-106**	**B-106**	**B-106**	**B-107**	**B-107**	**B-107**	**B-107**	**B-108**	**B-108**
				Sample Name	**B-106 (6.5-7.5)**	**B-106 (12-14)**	**B-106 (28-30)**	**B-107 (8.5-10)**	**B-107 (11-12)**	**B-107 (22-24)**	**SBDUP-01**	**B-108 (8-10)**	**B-108 (12-14)**
				Start Depth	**6.5**	**12**	**28**	**8.5**	**11**	**22**	**22**	**8**	**12**
				End Depth	**7.5**	**14**	**30**	**10**	**12**	**24**	**24**	**10**	**14**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/17/2012**	**5/17/2012**	**5/18/2012**	**5/16/2012**	**5/16/2012**	**5/16/2012**	**5/16/2012**	**5/17/2012**	**5/17/2012**
				Parent Sample							**B-107 (22-24)_05/16/12**		
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
BTEX	mg/kg												
Benzene		71-43-2	0.06	44	0.0011 U	**0.017**	0.001 U	1.1 U	**0.64 J**	0.001 U	0.0011 U	0.0011 U	0.001 U
Toluene		108-88-3	0.7	500	0.0011 U	**0.14**	**0.00035 J**	**0.33 J**	**120**	0.001 U	**0.0014**	0.0011 U	0.001 U
Ethylbenzene		100-41-4	1	390	0.0011 U	**0.094**	**0.00042 J**	**26**	**97**	0.001 U	**0.0019**	0.0011 U	0.001 U
Total Xylene		1330-20-7	1.6	500	0.0033 U	**0.11**	0.0031 U	**22**	**370**	0.0031 U	**0.0097**	0.0032 U	0.0031 U
Total BTEX (ND=0)		TBTEX_ND0	NE	NE	ND	**0.361**	**0.00077**	**48.33**	**587.64**	ND	**0.013**	ND	ND
Other VOCs	mg/kg												
Acetone		67-64-1	0.05	500	0.011 U	0.015 U	0.01 U	5.3 U	9.8 U	0.035 U	0.035 U	0.037 U	0.029 U
Bromodichloromethane		75-27-4	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromoform		75-25-2	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromomethane		74-83-9	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Carbon disulfide		75-15-0	NE	NE	0.0011 U	**0.00061 J**	**0.00027 J**	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Carbon tetrachloride		56-23-5	0.76	22	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Chlorobenzene		108-90-7	1.1	500	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloroethane		75-00-3	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloroform		67-66-3	0.37	350	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloromethane		74-87-3	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Dibromochloromethane		124-48-1	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1-Dichloroethane		75-34-3	0.27	240	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichloroethane		107-06-2	0.02	30	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1-Dichloroethene		75-35-4	0.33	500	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
cis-1,2-Dichloroethene		156-59-2	0.25	500	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
trans-1,2-Dichloroethene		156-60-5	0.19	500	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichloropropane		78-87-5	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
cis-1,3-Dichloropropene		10061-01-5	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
trans-1,3-Dichloropropene		10061-02-6	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
2-Hexanone		591-78-6	NE	NE	0.011 U	0.012 U	0.01 U	5.3 U	9.8 U	0.01 U	0.011 U	0.011 U	0.01 U
Methyl ethyl ketone (2-Butanone)		78-93-3	0.12	500	0.011 U	0.012 U	0.01 U	5.3 U	9.8 U	0.01 U	0.011 U	0.011 U	0.01 U
4-Methyl-2-pentanone (MIBK)		108-10-1	NE	NE	0.011 U	0.012 U	0.01 U	5.3 U	9.8 U	0.01 U	0.011 U	0.011 U	0.01 U
Methylene chloride		75-09-2	0.05	500	**0.0016**	**0.0081**	**0.008**	1.1 U	2 U	0.0031 U	0.01 U	0.012 U	0.0074 U
Styrene		100-42-5	NE	NE	0.0011 U	**0.034**	0.001 U	1.1 U	**290**	**0.00091 J**	**0.012**	0.0011 U	0.001 U
1,1,2,2-Tetrachloroethane		79-34-5	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Tetrachloroethene (PCE)		127-18-4	1.3	150	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,1-Trichloroethane (TCA)		71-55-6	0.68	500	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,2-Trichloroethane		79-00-5	NE	NE	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Trichloroethene (TCE)		79-01-6	0.47	0.4700	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Vinyl chloride		75-01-4	0.02	0.02000	0.0011 U	0.0012 U	0.001 U	1.1 U	2 U	0.001 U	0.0011 U	0.0011 U	0.001 U
Total VOCs (ND=0)		TVOC_ND0	NE	NE	**0.0016**	**0.40371**	**0.00904**	**48.33**	**877.64**	**0.00091**	**0.025**	ND	ND

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				Location Name	B-106	B-106	B-106	B-107	B-107	B-107	B-107	B-108	B-108
				Sample Name	B-106 (6.5-7.5)	B-106 (12-14)	B-106 (28-30)	B-107 (8.5-10)	B-107 (11-12)	B-107 (22-24)	SBDUP-01	B-108 (8-10)	B-108 (12-14)
				Start Depth	6.5	12	28	8.5	11	22	22	8	12
				End Depth	7.5	14	30	10	12	24	24	10	14
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/17/2012	5/17/2012	5/18/2012	5/16/2012	5/16/2012	5/16/2012	5/16/2012	5/17/2012	5/17/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**							B-107 (22-24)_05/16/12		
PAH17	mg/kg												
Acenaphthene		83-32-9	98	20.00	0.39 U	0.42 U	0.39 U	**7.1**	**17 J**	0.37 U	0.38 U	0.4 U	0.4 U
Acenaphthylene		208-96-8	107	100.0	0.39 U	0.42 U	0.39 U	**3.3 J**	**140**	**0.077 J**	0.38 U	0.4 U	0.4 U
Anthracene		120-12-7	1000	100.0	0.39 U	0.42 U	0.39 U	**12**	**70**	**0.07 J**	0.38 U	0.4 U	0.4 U
Benzo(a)anthracene		56-55-3	1	1.000	0.039 U	0.042 U	0.039 U	**7.4**	**36**	**0.064 J**	**0.039 J**	0.04 U	0.04 U
Benzo(b)fluoranthene		205-99-2	1.7	1.000	0.039 U	0.042 U	0.039 U	**3.3**	**15**	**0.03 J**	0.038 U	0.04 U	0.04 U
Benzo(k)fluoranthene		207-08-9	1.7	0.8000	0.039 U	0.042 U	0.039 U	**1.4**	**6.5**	0.037 U	0.038 U	0.04 U	0.04 U
Benzo(g,h,i)perylene		191-24-2	1000	100.0	0.39 U	0.42 U	0.39 U	**2.3 J**	**11 J**	0.37 U	0.38 U	0.4 U	0.4 U
Benzo(a)pyrene		50-32-8	22	1.000	0.039 U	0.042 U	0.039 U	**5.6**	**27**	**0.05**	**0.024 J**	0.04 U	0.04 U
Chrysene		218-01-9	1	1.000	0.39 U	0.42 U	0.39 U	**7.1**	**34**	**0.063 J**	0.38 U	0.4 U	0.4 U
Dibenz(a,h)anthracene		53-70-3	1000	0.3300	0.039 U	0.042 U	0.039 U	**0.56**	**3.1**	0.037 U	0.038 U	0.04 U	0.04 U
Fluoranthene		206-44-0	1000	100.0	0.39 U	0.42 U	0.39 U	**14**	**70**	**0.12 J**	**0.062 J**	0.4 U	0.4 U
Fluorene		86-73-7	386	30.00	0.39 U	0.42 U	0.39 U	**11**	**100**	**0.073 J**	0.38 U	0.4 U	0.4 U
Indeno(1,2,3-cd)pyrene		193-39-5	8.2	0.5000	0.039 U	0.042 U	0.039 U	**2**	**11**	0.037 U	0.038 U	0.04 U	0.04 U
2-Methylnaphthalene		91-57-6	NE	NE	0.39 U	0.42 U	0.39 U	**2.4 J**	**210**	**0.052 J**	0.38 U	0.4 U	0.4 U
Naphthalene		91-20-3	12	12.00	0.39 U	**0.061 J**	0.39 U	**0.71 J**	**180**	0.37 U	0.38 U	0.4 U	0.4 U
Phenanthrene		85-01-8	1000	100.0	0.39 U	**0.078 J**	0.39 U	**45**	**270**	**0.31 J**	**0.14 J**	0.4 U	0.4 U
Pyrene		129-00-0	1000	100.0	0.39 U	0.42 U	0.39 U	**20**	**100**	**0.16 J**	**0.084 J**	0.4 U	0.4 U
Total PAH (17) (ND=0)		TPAH17_ND0	NE	NE	ND	**0.139**	ND	**145.17**	**1300.6**	**1.069**	**0.349**	ND	ND
PAH17 Other SVOCs	mg/kg												
Bis(2-chloroethoxy)methane		111-91-1	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Bis(2-chloroethyl)ether		111-44-4	NE	NE	0.039 U	0.042 U	0.039 U	0.41 U	1.9 U	0.037 U	0.038 U	0.04 U	0.04 U
Bis(chloroisopropyl)ether		108-60-1	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Bis(2-ethylhexyl)phthalate		117-81-7	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
4-Bromophenyl phenyl ether		101-55-3	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Butyl benzyl phthalate		85-68-7	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Carbazole		86-74-8	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
4-Chloro-3-methylphenol		59-50-7	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
4-Chloroaniline		106-47-8	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
2-Chloronaphthalene		91-58-7	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
2-Chlorophenol		95-57-8	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
4-Chlorophenyl phenyl ether		7005-72-3	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Dibenzofuran		132-64-9	210	7.000	0.39 U	0.42 U	0.39 U	**0.98 J**	**14 J**	0.37 U	0.38 U	0.4 U	0.4 U
1,2-Dichlorobenzene		95-50-1	1.1	1.100	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
1,3-Dichlorobenzene		541-73-1	2.4	2.400	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
1,4-Dichlorobenzene		106-46-7	1.8	1.800	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
3,3-Dichlorobenzidine		91-94-1	NE	NE	0.79 U	0.85 U	0.79 U	8.3 U	39 U	0.74 U	0.77 U	0.82 U	0.81 U
2,4-Dichlorophenol		120-83-2	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U

				Location Name	**B-106**	**B-106**	**B-106**	**B-107**	**B-107**	**B-107**	**B-107**	**B-108**	**B-108**
				Sample Name	**B-106 (6.5-7.5)**	**B-106 (12-14)**	**B-106 (28-30)**	**B-107 (8.5-10)**	**B-107 (11-12)**	**B-107 (22-24)**	**SBDUP-01**	**B-108 (8-10)**	**B-108 (12-14)**
				Start Depth	**6.5**	**12**	**28**	**8.5**	**11**	**22**	**22**	**8**	**12**
				End Depth	**7.5**	**14**	**30**	**10**	**12**	**24**	**24**	**10**	**14**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/17/2012**	**5/17/2012**	**5/18/2012**	**5/16/2012**	**5/16/2012**	**5/16/2012**	**5/16/2012**	**5/17/2012**	**5/17/2012**
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**							**B-107 (22-24)_05/16/12**		
Diethyl phthalate		84-66-2	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Dimethyl phthalate		131-11-3	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
2,4-Dimethylphenol		105-67-9	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Di-n-butyl phthalate		84-74-2	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
4,6-Dinitro-2-methylphenol		534-52-1	NE	NE	1.2 U	1.3 U	1.2 U	12 U	59 U	1.1 U	1.1 U	1.2 U	1.2 U
2,4-Dinitrophenol		51-28-5	NE	NE	1.2 U	1.3 U	1.2 U	12 U	59 U	1.1 U	1.1 U	1.2 U	1.2 U
2,4-Dinitrotoluene		121-14-2	NE	NE	0.079 U	0.085 U	0.079 U	0.83 U	3.9 U	0.074 U	0.077 U	0.082 U	0.081 U
2,6-Dinitrotoluene		606-20-2	NE	NE	0.079 U	0.085 U	0.079 U	0.83 U	3.9 U	0.074 U	0.077 U	0.082 U	0.081 U
Di-n-octyl phthalate		117-84-0	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Hexachlorobenzene		118-74-1	3.2	0.3300	0.039 U	0.042 U	0.039 U	0.41 U	1.9 U	0.037 U	0.038 U	0.04 U	0.04 U
Hexachlorobutadiene (C-46)		87-68-3	NE	NE	0.079 U	0.085 U	0.079 U	0.83 U	3.9 U	0.074 U	0.077 U	0.082 U	0.081 U
Hexachlorocyclopentadiene		77-47-4	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Hexachloroethane		67-72-1	NE	NE	0.039 U	0.042 U	0.039 U	0.41 U	1.9 U	0.037 U	0.038 U	0.04 U	0.04 U
Isophorone		78-59-1	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
2-Methylphenol (o-Cresol)		95-48-7	0.33	0.3300	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
4-Methylphenol (p-Cresol)		106-44-5	0.33	0.3300	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
2-Nitroaniline		88-74-4	NE	NE	0.79 U	0.85 U	0.79 U	8.3 U	39 U	0.74 U	0.77 U	0.82 U	0.81 U
3-Nitroaniline		99-09-2	NE	NE	0.79 U	0.85 U	0.79 U	8.3 U	39 U	0.74 U	0.77 U	0.82 U	0.81 U
4-Nitroaniline		100-01-6	NE	NE	0.79 U	0.85 U	0.79 U	8.3 U	39 U	0.74 U	0.77 U	0.82 U	0.81 U
Nitrobenzene		98-95-3	NE	NE	0.039 U	0.042 U	0.039 U	0.41 U	1.9 U	0.037 U	0.038 U	0.04 U	0.04 U
2-Nitrophenol		88-75-5	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
4-Nitrophenol		100-02-7	NE	NE	1.2 U	1.3 U	1.2 U	12 U	59 U	1.1 U	1.1 U	1.2 U	1.2 U
N-Nitrosodiphenylamine (NDFA)		86-30-6	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
N-Nitrosodi-n-propylamine (NDPA)		621-64-7	NE	NE	0.039 U	0.042 U	0.039 U	0.41 U	1.9 U	0.037 U	0.038 U	0.04 U	0.04 U
Pentachlorophenol		87-86-5	0.8	0.8000	1.2 U	1.3 U	1.2 U	12 U	59 U	1.1 U	1.1 U	1.2 U	1.2 U
Phenol		108-95-2	0.33	0.3300	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
1,2,4-Trichlorobenzene		120-82-1	NE	NE	0.039 U	0.042 U	0.039 U	0.41 U	1.9 U	0.037 U	0.038 U	0.04 U	0.04 U
2,4,5-Trichlorophenol		95-95-4	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
2,4,6-Trichlorophenol		88-06-2	NE	NE	0.39 U	0.42 U	0.39 U	4.1 U	19 U	0.37 U	0.38 U	0.4 U	0.4 U
Total SVOCs (ND=0)		TSVOC_ND0	NE	NE	ND	**0.139**	ND	**146.15**	**1314.6**	**1.069**	**0.349**	ND	ND
Total Metals	mg/kg												
Aluminum		7429-90-5	NE	NE	**502 J**	**426 J**	**239 J**	**313 J**	**281 J**	**464 J**	**452 J**	**218 J**	**302 J**
Antimony		7440-36-0	NE	NE	2.3 U	2.4 U	2.4 U	2.2 U	2.2 U	2.1 U	2.2 U	2.4 U	2.3 U
Arsenic		7440-38-2	16	13.00	**4.2**	1.2 U	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.2 U
Barium		7440-39-3	820	350.0	**2.5 J**	**2.4 J**	47 U	**4.4 J**	44.3 U	42.5 U	43.8 U	**3.1 J**	**3.5 J**
Beryllium		7440-41-7	47	7.200	0.45 U	0.48 U	0.47 U	0.44 U	0.44 U	0.43 U	0.44 U	0.49 U	0.47 U
Cadmium		7440-43-9	7.5	2.500	**0.28 J**	1.2 U	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.2 U
Calcium		7440-70-2	NE	NE	**356 J**	**260 J**	**121 J**	**503 J**	**132 J**	**244 J**	**347 J**	**149 J**	**164 J**

Table X. Belle Harbor
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				Location Name	**B-106**	**B-106**	**B-106**	**B-107**	**B-107**	**B-107**	**B-107**	**B-108**	**B-108**
				Sample Name	**B-106 (6.5-7.5)**	**B-106 (12-14)**	**B-106 (28-30)**	**B-107 (8.5-10)**	**B-107 (11-12)**	**B-107 (22-24)**	**SBDUP-01**	**B-108 (8-10)**	**B-108 (12-14)**
				Start Depth	**6.5**	**12**	**28**	**8.5**	**11**	**22**	**22**	**8**	**12**
				End Depth	**7.5**	**14**	**30**	**10**	**12**	**24**	**24**	**10**	**14**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/17/2012**	**5/17/2012**	**5/18/2012**	**5/16/2012**	**5/16/2012**	**5/16/2012**	**5/16/2012**	**5/17/2012**	**5/17/2012**
				Parent Sample							**B-107 (22-24)_05/16/12**		
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Chromium		7440-47-3	NE	NE	**7.5**	**2.3 J**	**1.1 J**	**1.8 J**	**1.5 J**	2.1 U	2.2 U	**1.3 J**	**1.7 J**
Cobalt		7440-48-4	NE	NE	11.3 U	12.1 U	11.8 U	11.1 U	11.1 U	10.6 U	10.9 U	12.2 U	11.7 U
Copper		7440-50-8	1720	50.00	5.7 U	6.1 U	5.9 U	**3.2 J**	5.5 U	**3.8 J**	**2.6 J**	6.1 U	5.8 U
Iron		7439-89-6	NE	NE	**9140**	**645**	**529**	**1630**	**426**	**558**	**545**	**469**	**976**
Lead		7439-92-1	450	63.00	**1.6**	**1.4**	1.2 U	**177**	1.1 U	1.1 U	1.1 U	**1.2**	**1.1 J**
Magnesium		7439-95-4	NE	NE	**137 J**	**153 J**	**111 J**	**181 J**	**95.8 J**	1060 U	1090 U	1220 U	**126 J**
Manganese		7439-96-5	2000	1600	**13.4**	**9.3**	**4.8**	**7.2**	**4.5**	**4.3**	**4.2**	**4.9**	**6.5**
Mercury		7439-97-6	0.73	0.1800	**0.025 J**	0.04 U	0.036 U	0.037 U	0.035 U	0.035 U	0.036 U	0.036 U	0.037 U
Nickel		7440-02-0	130	30.00	**1.1 J**	**1.4 J**	9.4 U	**1.4 J**	8.9 U	8.5 U	8.8 U	9.7 U	9.3 U
Potassium		7440-09-7	NE	NE	1130 U	1210 U	1180 U	1110 U	1110 U	1060 U	1090 U	1220 U	1170 U
Selenium		7782-49-2	4	3.900	2.3 U	2.4 U	2.4 U	2.2 U	2.2 U	2.1 U	2.2 U	2.4 U	2.3 U
Silver		7440-22-4	8.3	2.000	2.3 U	2.4 U	2.4 U	2.2 U	2.2 U	2.1 U	2.2 U	2.4 U	2.3 U
Sodium		7440-23-5	NE	NE	1130 U	1210 U	1180 U	1110 U	1110 U	1060 U	1090 U	1220 U	1170 U
Thallium		7440-28-0	NE	NE	2.3 U	2.4 U	2.4 U	2.2 U	2.2 U	2.1 U	2.2 U	2.4 U	2.3 U
Vanadium		7440-62-2	NE	NE	**22**	**2.6 J**	**0.92 J**	**1.6 J**	**1.4 J**	**0.85 J**	**0.86 J**	**1 J**	**2.2 J**
Zinc		7440-66-6	2480	109.0	**16.4**	**8.1**	**2.6 J**	**28.5**	**11.7**	**7.1**	**7.3**	**5.7 J**	**3.3 J**
Cyanides	mg/kg												
Free Cyanide		FREECN	NE	NE	0.51 U	0.54 U	**0.8**	**0.67 J**	0.5 UJ	**0.29 J**	**0.34 J**	0.51 UJ	0.51 UJ
Total Cyanide		57-12-5	40	27.00	**10**	**0.22 J**	0.59 U	**3.6 J**	**0.26 J**	**0.58 J**	**0.48 J**	**7**	**0.99**

Table X. Belle Harbor
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Analyte	Units	CAS No.	Protection of Groundwater SCO	Commercial SCO	B-108	B-109	B-109	B-109	B-110	B-110	B-110	B-110	B-111
				Location Name	B-108	B-109	B-109	B-109	B-110	B-110	B-110	B-110	B-111
				Sample Name	B-108 (30-32)	B-109 (7-9)	B-109 (12-14)	B-109 (38-40)	B-110(1-3)	B-110 (5.5-7.5)	B-110 (12-14)	B-110 (21-23)	B-111(6.5-7.5)
				Start Depth	30	7	12	38	1	5.5	12	21	6.5
				End Depth	32	9	14	40	3	7.5	14	23	7.5
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/17/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/25/2012
				Parent Sample									
BTEX	mg/kg												
Benzene		71-43-2	0.06	44	0.0011 U	0.0012 U	0.0012 U	0.0014 U	**0.0016**	0.0013 U	0.0011 U	0.0012 U	0.001 U
Toluene		108-88-3	0.7	500	0.0011 U	0.0012 U	0.0012 U	0.0014 U	**0.0021**	0.0013 U	0.0011 U	0.0012 U	0.001 U
Ethylbenzene		100-41-4	1	390	0.0011 U	0.0012 U	0.0012 U	0.0014 U	**0.00022 J**	0.0013 U	0.0011 U	0.0012 U	0.001 U
Total Xylene		1330-20-7	1.6	500	0.0034 U	0.0035 U	0.0035 U	0.0041 U	**0.0018 J**	0.0038 U	0.0034 U	0.0036 U	0.003 U
Total BTEX (ND=0)		TBTEX_ND0	NE	NE	ND	ND	ND	ND	**0.00572**	ND	ND	ND	ND
Other VOCs	mg/kg												
Acetone		67-64-1	0.05	500	0.011 U	0.012 U	0.012 U	0.014 U	0.011 U	0.013 U	0.011 U	0.012 U	0.01 U
Bromodichloromethane		75-27-4	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Bromoform		75-25-2	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Bromomethane		74-83-9	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Carbon disulfide		75-15-0	NE	NE	0.0011 U	0.0012 U	0.0012 U	**0.0011 J**	**0.0019**	0.0013 U	**0.0015**	**0.00071 J**	0.001 U
Carbon tetrachloride		56-23-5	0.76	22	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Chlorobenzene		108-90-7	1.1	500	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Chloroethane		75-00-3	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Chloroform		67-66-3	0.37	350	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Chloromethane		74-87-3	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Dibromochloromethane		124-48-1	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
1,1-Dichloroethane		75-34-3	0.27	240	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
1,2-Dichloroethane		107-06-2	0.02	30	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
1,1-Dichloroethene		75-35-4	0.33	500	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
cis-1,2-Dichloroethene		156-59-2	0.25	500	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
trans-1,2-Dichloroethene		156-60-5	0.19	500	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
1,2-Dichloropropane		78-87-5	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
cis-1,3-Dichloropropene		10061-01-5	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
trans-1,3-Dichloropropene		10061-02-6	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
2-Hexanone		591-78-6	NE	NE	0.011 U	0.012 U	0.012 U	0.014 U	0.0096 U	0.013 U	0.011 U	0.012 U	0.01 U
Methyl ethyl ketone (2-Butanone)		78-93-3	0.12	500	0.011 U	0.012 U	0.012 U	0.014 U	0.0096 U	0.013 U	0.011 U	0.012 U	0.01 U
4-Methyl-2-pentanone (MIBK)		108-10-1	NE	NE	0.011 U	0.012 U	0.012 U	0.014 U	0.0096 U	0.013 U	0.011 U	0.012 U	0.01 U
Methylene chloride		75-09-2	0.05	500	**0.0051**	**0.00074 J**	**0.00062 J**	**0.00031 J**	0.001 U	0.0013 U	0.0013 U	0.0012 U	0.0053 U
Styrene		100-42-5	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	**0.0036**	0.0013 U	0.0011 U	0.0012 U	**0.0027**
1,1,2,2-Tetrachloroethane		79-34-5	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Tetrachloroethene (PCE)		127-18-4	1.3	150	0.0011 U	**0.00023 J**	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	**0.00042 J**
1,1,1-Trichloroethane (TCA)		71-55-6	0.68	500	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
1,1,2-Trichloroethane		79-00-5	NE	NE	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Trichloroethene (TCE)		79-01-6	0.47	0.4700	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Vinyl chloride		75-01-4	0.02	0.02000	0.0011 U	0.0012 U	0.0012 U	0.0014 U	0.00096 U	0.0013 U	0.0011 U	0.0012 U	0.001 U
Total VOCs (ND=0)		TVOC_ND0	NE	NE	**0.0051**	**0.00097**	**0.00062**	**0.00141**	**0.01122**	ND	**0.0015**	**0.00071**	**0.00312**

Table X. Belle Harbor
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Rockaway Park, NY

				Location Name	B-108	B-109	B-109	B-109	B-110	B-110	B-110	B-110	B-111
				Sample Name	B-108 (30-32)	B-109 (7-9)	B-109 (12-14)	B-109 (38-40)	B-110(1-3)	B-110 (5.5-7.5)	B-110 (12-14)	B-110 (21-23)	B-111(6.5-7.5)
				Start Depth	30	7	12	38	1	5.5	12	21	6.5
				End Depth	32	9	14	40	3	7.5	14	23	7.5
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/17/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/25/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
PAH17	mg/kg												
Acenaphthene		83-32-9	98	20.00	0.44 U	0.39 U	0.4 U	0.45 U	**1.3 J**	0.45 U	0.42 U	0.41 U	0.78 U
Acenaphthylene		208-96-8	107	100.0	0.44 U	0.39 U	0.4 U	0.45 U	**3.1 J**	0.45 U	0.42 U	0.41 U	**1.7**
Anthracene		120-12-7	1000	100.0	0.44 U	0.39 U	0.4 U	0.45 U	**6.5**	0.45 U	0.42 U	0.41 U	**1.6**
Benzo(a)anthracene		56-55-3	1	1.000	0.044 U	0.039 U	0.04 U	0.045 U	**10**	0.045 U	0.042 U	0.041 U	**4.4**
Benzo(b)fluoranthene		205-99-2	1.7	1.000	0.044 U	0.039 U	0.04 U	0.045 U	**5.7**	0.045 U	0.042 U	0.041 U	**2.9**
Benzo(k)fluoranthene		207-08-9	1.7	0.8000	0.044 U	0.039 U	0.04 U	0.045 U	**2.7**	0.045 U	0.042 U	0.041 U	**1**
Benzo(g,h,i)perylene		191-24-2	1000	100.0	0.44 U	0.39 U	0.4 U	0.45 U	**6**	0.45 U	0.42 U	0.41 U	**1.6**
Benzo(a)pyrene		50-32-8	22	1.000	0.044 U	0.039 U	0.04 U	0.045 U	**3.3**	0.045 U	0.042 U	0.041 U	**3.1**
Chrysene		218-01-9	1	1.000	0.44 U	0.39 U	0.4 U	0.45 U	**13**	0.45 U	0.42 U	0.41 U	**4.8**
Dibenz(a,h)anthracene		53-70-3	1000	0.3300	0.044 U	0.039 U	0.04 U	0.045 U	**1.1**	0.045 U	0.042 U	0.041 U	**0.5**
Fluoranthene		206-44-0	1000	100.0	0.44 U	0.39 U	0.4 U	0.45 U	**26**	0.45 U	0.42 U	0.41 U	**5.3**
Fluorene		86-73-7	386	30.00	0.44 U	0.39 U	0.4 U	0.45 U	**7.2**	0.45 U	0.42 U	0.41 U	**1.2**
Indeno(1,2,3-cd)pyrene		193-39-5	8.2	0.5000	0.044 U	0.039 U	0.04 U	0.045 U	**5**	0.045 U	0.042 U	0.041 U	**1.5**
2-Methylnaphthalene		91-57-6	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	**19**	0.45 U	0.42 U	0.41 U	**0.17 J**
Naphthalene		91-20-3	12	12.00	0.44 U	0.39 U	0.4 U	0.45 U	**6.3**	0.45 U	0.42 U	0.41 U	0.78 U
Phenanthrene		85-01-8	1000	100.0	0.44 U	0.39 U	0.4 U	0.45 U	**63**	0.45 U	0.42 U	0.41 U	**5.1**
Pyrene		129-00-0	1000	100.0	0.44 U	0.39 U	0.4 U	0.45 U	**29**	0.45 U	0.42 U	0.41 U	**15**
Total PAH (17) (ND=0)		TPAH17_ND0	NE	NE	ND	ND	ND	ND	**208.2**	ND	ND	ND	**49.87**
PAH17 Other SVOCs	mg/kg												
Bis(2-chloroethoxy)methane		111-91-1	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Bis(2-chloroethyl)ether		111-44-4	NE	NE	0.044 U	0.039 U	0.04 U	0.045 U	0.35 U	0.045 U	0.042 U	0.041 U	0.078 U
Bis(chloroisopropyl)ether		108-60-1	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Bis(2-ethylhexyl)phthalate		117-81-7	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
4-Bromophenyl phenyl ether		101-55-3	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Butyl benzyl phthalate		85-68-7	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Carbazole		86-74-8	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
4-Chloro-3-methylphenol		59-50-7	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
4-Chloroaniline		106-47-8	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
2-Chloronaphthalene		91-58-7	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
2-Chlorophenol		95-57-8	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
4-Chlorophenyl phenyl ether		7005-72-3	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Dibenzofuran		132-64-9	210	7.000	0.44 U	0.39 U	0.4 U	0.45 U	**1.8 J**	0.45 U	0.42 U	0.41 U	**0.097 J**
1,2-Dichlorobenzene		95-50-1	1.1	1.100	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
1,3-Dichlorobenzene		541-73-1	2.4	2.400	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
1,4-Dichlorobenzene		106-46-7	1.8	1.800	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
3,3-Dichlorobenzidine		91-94-1	NE	NE	0.89 U	0.78 U	0.8 U	0.91 U	7 U	0.91 U	0.85 U	0.83 U	1.6 U
2,4-Dichlorophenol		120-83-2	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U

				Location Name	B-108	B-109	B-109	B-109	B-110	B-110	B-110	B-110	B-111
				Sample Name	B-108 (30-32)	B-109 (7-9)	B-109 (12-14)	B-109 (38-40)	B-110(1-3)	B-110 (5.5-7.5)	B-110 (12-14)	B-110 (21-23)	B-111(6.5-7.5)
				Start Depth	30	7	12	38	1	5.5	12	21	6.5
				End Depth	32	9	14	40	3	7.5	14	23	7.5
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/17/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/25/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Diethyl phthalate		84-66-2	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Dimethyl phthalate		131-11-3	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
2,4-Dimethylphenol		105-67-9	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Di-n-butyl phthalate		84-74-2	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
4,6-Dinitro-2-methylphenol		534-52-1	NE	NE	1.3 U	1.2 U	1.2 U	1.4 U	11 U	1.4 U	1.3 U	1.2 U	2.4 U
2,4-Dinitrophenol		51-28-5	NE	NE	1.3 U	1.2 U	1.2 U	1.4 U	11 U	1.4 U	1.3 U	1.2 U	2.4 U
2,4-Dinitrotoluene		121-14-2	NE	NE	0.089 U	0.078 U	0.08 U	0.091 U	0.7 U	0.091 U	0.085 U	0.083 U	0.16 U
2,6-Dinitrotoluene		606-20-2	NE	NE	0.089 U	0.078 U	0.08 U	0.091 U	0.7 U	0.091 U	0.085 U	0.083 U	0.16 U
Di-n-octyl phthalate		117-84-0	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Hexachlorobenzene		118-74-1	3.2	0.3300	0.044 U	0.039 U	0.04 U	0.045 U	0.35 U	0.045 U	0.042 U	0.041 U	0.078 U
Hexachlorobutadiene (C-46)		87-68-3	NE	NE	0.089 U	0.078 U	0.08 U	0.091 U	0.7 U	0.091 U	0.085 U	0.083 U	0.16 U
Hexachlorocyclopentadiene		77-47-4	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Hexachloroethane		67-72-1	NE	NE	0.044 U	0.039 U	0.04 U	0.045 U	0.35 U	0.045 U	0.042 U	0.041 U	0.078 U
Isophorone		78-59-1	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
2-Methylphenol (o-Cresol)		95-48-7	0.33	0.3300	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
4-Methylphenol (p-Cresol)		106-44-5	0.33	0.3300	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
2-Nitroaniline		88-74-4	NE	NE	0.89 U	0.78 U	0.8 U	0.91 U	7 U	0.91 U	0.85 U	0.83 U	1.6 U
3-Nitroaniline		99-09-2	NE	NE	0.89 U	0.78 U	0.8 U	0.91 U	7 U	0.91 U	0.85 U	0.83 U	1.6 U
4-Nitroaniline		100-01-6	NE	NE	0.89 U	0.78 U	0.8 U	0.91 U	7 U	0.91 U	0.85 U	0.83 U	1.6 U
Nitrobenzene		98-95-3	NE	NE	0.044 U	0.039 U	0.04 U	0.045 U	0.35 U	0.045 U	0.042 U	0.041 U	0.078 U
2-Nitrophenol		88-75-5	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
4-Nitrophenol		100-02-7	NE	NE	1.3 U	1.2 U	1.2 U	1.4 U	11 U	1.4 U	1.3 U	1.2 U	2.4 U
N-Nitrosodiphenylamine (NDFA)		86-30-6	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
N-Nitrosodi-n-propylamine (NDPA)		621-64-7	NE	NE	0.044 U	0.039 U	0.04 U	0.045 U	0.35 U	0.045 U	0.042 U	0.041 U	0.078 U
Pentachlorophenol		87-86-5	0.8	0.8000	1.3 U	1.2 U	1.2 U	1.4 U	11 U	1.4 U	1.3 U	1.2 U	2.4 U
Phenol		108-95-2	0.33	0.3300	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
1,2,4-Trichlorobenzene		120-82-1	NE	NE	0.044 U	0.039 U	0.04 U	0.045 U	0.35 U	0.045 U	0.042 U	0.041 U	0.078 U
2,4,5-Trichlorophenol		95-95-4	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
2,4,6-Trichlorophenol		88-06-2	NE	NE	0.44 U	0.39 U	0.4 U	0.45 U	3.5 U	0.45 U	0.42 U	0.41 U	0.78 U
Total SVOCs (ND=0)		TSVOC_ND0	NE	NE	ND	ND	ND	ND	**210**	ND	ND	ND	**49.967**
Total Metals	mg/kg												
Aluminum		7429-90-5	NE	NE	**256 J**	**359 J**	**325 J**	**369 J**	**261 J**	**402 J**	**509 J**	**346 J**	**308 J**
Antimony		7440-36-0	NE	NE	2.4 U	2.1 U	2.3 U	2.6 U	1.9 U	2.6 U	2.5 U	2.4 U	2.3 U
Arsenic		7440-38-2	16	13.00	1.2 U	1.1 U	1.2 U	**1.2 J**	**2**	1.3 U	1.3 U	1.2 U	**1.2**
Barium		7440-39-3	820	350.0	48.6 U	**2.7 J**	46.6 U	51 U	**7 J**	**2.7 J**	**1.4 J**	47.3 U	**4.2 J**
Beryllium		7440-41-7	47	7.200	0.49 U	0.43 U	0.47 U	0.51 U	0.38 U	0.52 U	0.5 U	0.47 U	0.45 U
Cadmium		7440-43-9	7.5	2.500	1.2 U	1.1 U	1.2 U	1.3 U	0.96 U	1.3 U	1.3 U	1.2 U	1.1 U
Calcium		7440-70-2	NE	NE	**155 J**	**169 J**	**156 J**	**477 J**	**8560**	**202 J**	**121 J**	**806 J**	**2210**

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	B-108	B-109	B-109	B-109	B-110	B-110	B-110	B-110	B-111
				Sample Name	B-108 (30-32)	B-109 (7-9)	B-109 (12-14)	B-109 (38-40)	B-110(1-3)	B-110 (5.5-7.5)	B-110 (12-14)	B-110 (21-23)	B-111(6.5-7.5)
				Start Depth	30	7	12	38	1	5.5	12	21	6.5
				End Depth	32	9	14	40	3	7.5	14	23	7.5
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/17/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/22/2012	5/25/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Chromium		7440-47-3	NE	NE	**2.3 J**	**2 J**	**1.9 J**	**1.8 J**	**2.5**	**2 J**	**1.5 J**	**1.6 J**	**1.9 J**
Cobalt		7440-48-4	NE	NE	12.1 U	10.7 U	11.6 U	12.8 U	9.6 U	13.1 U	12.6 U	11.8 U	11.3 U
Copper		7440-50-8	1720	50.00	6.1 U	**2.8 J**	5.8 U	6.4 U	**7.6**	6.6 U	6.3 U	5.9 U	**2.8 J**
Iron		7439-89-6	NE	NE	**603**	**1060 J**	**619 J**	**887 J**	**4040**	**2460**	**768**	**949**	**1680**
Lead		7439-92-1	450	63.00	1.2 U	**4.3**	1.2 U	1.3 U	**133**	**1.1 J**	1.3 U	1.2 U	**7.9**
Magnesium		7439-95-4	NE	NE	**114 J**	**101 J**	**125 J**	**175 J**	**525 J**	**191 J**	**137 J**	**167 J**	**1080 J**
Manganese		7439-96-5	2000	1600	**5.4**	**28.9 J**	**6.9 J**	**7.4 J**	**15.2**	**15.1**	**5.9**	**8**	**10.2**
Mercury		7439-97-6	0.73	0.1800	0.042 U	0.039 U	0.036 U	0.042 U	0.03 U	0.04 U	0.037 U	0.04 U	0.036 U
Nickel		7440-02-0	130	30.00	9.7 U	8.5 U	9.3 U	10.2 U	**1.3 J**	10.5 U	**1.5 J**	9.5 U	**1 J**
Potassium		7440-09-7	NE	NE	1210 U	1070 U	1160 U	1280 U	**150 J**	**142 J**	1260 U	1180 U	**144 J**
Selenium		7782-49-2	4	3.900	2.4 U	2.1 U	2.3 U	2.6 U	1.9 U	2.6 U	2.5 U	2.4 U	2.3 U
Silver		7440-22-4	8.3	2.000	2.4 U	2.1 U	**0.25 J**	2.6 U	1.9 U	2.6 U	2.5 U	2.4 U	2.3 U
Sodium		7440-23-5	NE	NE	1210 U	1070 U	1160 U	1280 U	956 U	1310 U	1260 U	1180 U	1130 U
Thallium		7440-28-0	NE	NE	2.4 U	2.1 U	2.3 U	2.6 U	1.9 U	2.6 U	2.5 U	2.4 U	2.3 U
Vanadium		7440-62-2	NE	NE	**1.2 J**	**1.7 J**	**1.7 J**	**1.3 J**	**2.7 J**	**3 J**	**1.7 J**	**1.7 J**	**2.7 J**
Zinc		7440-66-6	2480	109.0	**1.7 J**	**7.2**	**9.2**	**3.4 J**	**4.9 J**	**3.3 J**	**5.9 J**	**2.2 J**	**4.8 J**
Cyanides	mg/kg												
Free Cyanide		FREECN	NE	NE	**0.14 J**	0.49 U	0.5 U	0.59 U	**8.9**	0.57 U	0.53 U	**0.49 J**	0.52 U
Total Cyanide		57-12-5	40	27.00	0.66 U	**0.76**	**1.6**	0.68 U	**127**	0.68 U	**1.1**	0.62 U	**3.5**

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	**B-111**	**B-111**	**B-112**	**B-112**	**B-113**	**B-113**	**B-113**	**B-114**	**B-114**
				Sample Name	**B-111(13.5-15)**	**B-111(21-23)**	**B-112 (4.5-5.5)**	**B-112 (38-40)**	**B-113 (8-10)**	**B-113 (13-15)**	**B-113 (38-40)**	**B-114 (7.5-9.5)**	**B-114 (11-13)**
				Start Depth	**13.5**	**21**	**4.5**	**38**	**8**	**13**	**38**	**7.5**	**11**
				End Depth	**15**	**23**	**5.5**	**40**	**10**	**15**	**40**	**9.5**	**13**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/25/2012**	**5/25/2012**	**5/23/2012**	**5/23/2012**	**5/22/2012**	**5/22/2012**	**5/22/2012**	**5/29/2012**	**5/29/2012**
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
BTEX	mg/kg												
Benzene		71-43-2	0.06	44	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	**0.00091 J**	0.0012 U
Toluene		108-88-3	0.7	500	**0.00066 J**	**0.00031 J**	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	**0.0006 J**	0.0012 U
Ethylbenzene		100-41-4	1	390	**0.0092**	**0.00033 J**	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	**0.0029**	0.0012 U
Total Xylene		1330-20-7	1.6	500	**0.011**	0.0032 U	0.0039 U	0.003 U	0.0034 U	0.0038 U	0.0036 U	**0.0039**	0.0035 U
Total BTEX (ND=0)		TBTEX_ND0	NE	NE	**0.02086**	**0.00064**	ND	ND	ND	ND	ND	**0.00831**	ND
Other VOCs	mg/kg												
Acetone		67-64-1	0.05	500	0.015 U	0.018 U	0.013 U	0.01 U	0.011 U	0.013 U	0.012 U	0.012 U	0.012 U
Bromodichloromethane		75-27-4	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Bromoform		75-25-2	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Bromomethane		74-83-9	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Carbon disulfide		75-15-0	NE	NE	**0.00047 J**	**0.0012**	0.0013 U	**0.00093 J**	0.0011 U	0.0013 U	**0.0011 J**	**0.0027**	0.0012 U
Carbon tetrachloride		56-23-5	0.76	22	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Chlorobenzene		108-90-7	1.1	500	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Chloroethane		75-00-3	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Chloroform		67-66-3	0.37	350	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Chloromethane		74-87-3	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Dibromochloromethane		124-48-1	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
1,1-Dichloroethane		75-34-3	0.27	240	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
1,2-Dichloroethane		107-06-2	0.02	30	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
1,1-Dichloroethene		75-35-4	0.33	500	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
cis-1,2-Dichloroethene		156-59-2	0.25	500	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
trans-1,2-Dichloroethene		156-60-5	0.19	500	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
1,2-Dichloropropane		78-87-5	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
cis-1,3-Dichloropropene		10061-01-5	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
trans-1,3-Dichloropropene		10061-02-6	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
2-Hexanone		591-78-6	NE	NE	0.012 U	0.011 U	0.013 U	0.01 U	0.011 U	0.013 U	0.012 U	0.012 U	0.012 U
Methyl ethyl ketone (2-Butanone)		78-93-3	0.12	500	0.012 U	0.011 U	0.013 U	0.01 U	0.011 U	0.013 U	0.012 U	**0.0019 J**	0.012 U
4-Methyl-2-pentanone (MIBK)		108-10-1	NE	NE	0.012 U	0.011 U	0.013 U	0.01 U	0.011 U	0.013 U	0.012 U	0.012 U	0.012 U
Methylene chloride		75-09-2	0.05	500	0.0093 U	0.0051 U	0.0013 U	0.0015 U	**0.00048 J**	0.0013 U	**0.0006 J**	0.0012 U	0.0012 U
Styrene		100-42-5	NE	NE	0.0012 U	**0.0023**	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
1,1,2,2-Tetrachloroethane		79-34-5	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Tetrachloroethene (PCE)		127-18-4	1.3	150	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
1,1,1-Trichloroethane (TCA)		71-55-6	0.68	500	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
1,1,2-Trichloroethane		79-00-5	NE	NE	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Trichloroethene (TCE)		79-01-6	0.47	0.4700	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Vinyl chloride		75-01-4	0.02	0.02000	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U
Total VOCs (ND=0)		TVOC_ND0	NE	NE	**0.02133**	**0.00414**	ND	**0.00093**	**0.00048**	ND	**0.0017**	**0.01291**	ND

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	B-111	B-111	B-112	B-112	B-113	B-113	B-113	B-114	B-114
				Sample Name	B-111(13.5-15)	B-111(21-23)	B-112 (4.5-5.5)	B-112 (38-40)	B-113 (8-10)	B-113 (13-15)	B-113 (38-40)	B-114 (7.5-9.5)	B-114 (11-13)
				Start Depth	13.5	21	4.5	38	8	13	38	7.5	11
				End Depth	15	23	5.5	40	10	15	40	9.5	13
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/25/2012	5/25/2012	5/23/2012	5/23/2012	5/22/2012	5/22/2012	5/22/2012	5/29/2012	5/29/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
PAH17	mg/kg												
Acenaphthene		83-32-9	98	20.00	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Acenaphthylene		208-96-8	107	100.0	0.4 U	0.36 U	**0.15 J**	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Anthracene		120-12-7	1000	100.0	0.4 U	0.36 U	**0.067 J**	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Benzo(a)anthracene		56-55-3	1	1.000	0.04 U	0.036 U	**0.55**	0.04 U	0.039 U	0.044 U	0.04 U	**0.067**	0.044 U
Benzo(b)fluoranthene		205-99-2	1.7	1.000	0.04 U	0.036 U	**0.37**	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Benzo(k)fluoranthene		207-08-9	1.7	0.8000	0.04 U	0.036 U	**0.16**	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Benzo(g,h,i)perylene		191-24-2	1000	100.0	0.4 U	0.36 U	**0.28 J**	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Benzo(a)pyrene		50-32-8	22	1.000	0.04 U	0.036 U	**0.45**	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Chrysene		218-01-9	1	1.000	0.4 U	0.36 U	**0.65**	0.4 U	0.39 U	0.44 U	0.4 U	**0.058 J**	0.44 U
Dibenz(a,h)anthracene		53-70-3	1000	0.3300	0.04 U	0.036 U	**0.071**	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Fluoranthene		206-44-0	1000	100.0	0.4 U	0.36 U	**0.79**	0.4 U	0.39 U	0.44 U	0.4 U	**0.12 J**	0.44 U
Fluorene		86-73-7	386	30.00	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Indeno(1,2,3-cd)pyrene		193-39-5	8.2	0.5000	0.04 U	0.036 U	**0.27**	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
2-Methylnaphthalene		91-57-6	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Naphthalene		91-20-3	12	12.00	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Phenanthrene		85-01-8	1000	100.0	0.4 U	0.36 U	**0.11 J**	0.4 U	0.39 U	0.44 U	0.4 U	**0.17 J**	0.44 U
Pyrene		129-00-0	1000	100.0	0.4 U	0.36 U	**1.1**	0.4 U	0.39 U	0.44 U	0.4 U	**0.14 J**	0.44 U
Total PAH (17) (ND=0)		TPAH17_ND0	NE	NE	ND	ND	**5.018**	ND	ND	ND	ND	**0.555**	ND
PAH17 Other SVOCs	mg/kg												
Bis(2-chloroethoxy)methane		111-91-1	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Bis(2-chloroethyl)ether		111-44-4	NE	NE	0.04 U	0.036 U	0.046 U	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Bis(chloroisopropyl)ether		108-60-1	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Bis(2-ethylhexyl)phthalate		117-81-7	NE	NE	0.4 U	**0.17 J**	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
4-Bromophenyl phenyl ether		101-55-3	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Butyl benzyl phthalate		85-68-7	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Carbazole		86-74-8	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
4-Chloro-3-methylphenol		59-50-7	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
4-Chloroaniline		106-47-8	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
2-Chloronaphthalene		91-58-7	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
2-Chlorophenol		95-57-8	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
4-Chlorophenyl phenyl ether		7005-72-3	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Dibenzofuran		132-64-9	210	7.000	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
1,2-Dichlorobenzene		95-50-1	1.1	1.100	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
1,3-Dichlorobenzene		541-73-1	2.4	2.400	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
1,4-Dichlorobenzene		106-46-7	1.8	1.800	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
3,3-Dichlorobenzidine		91-94-1	NE	NE	0.81 U	0.74 U	0.93 U	0.81 U	0.78 U	0.89 U	0.82 U	0.81 U	0.88 U
2,4-Dichlorophenol		120-83-2	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U

Table X. Belle Harbor
Soil Analysis Results
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Rockaway Park, NY

				Location Name	**B-111**	**B-111**	**B-112**	**B-112**	**B-113**	**B-113**	**B-113**	**B-114**	**B-114**
				Sample Name	**B-111(13.5-15)**	**B-111(21-23)**	**B-112 (4.5-5.5)**	**B-112 (38-40)**	**B-113 (8-10)**	**B-113 (13-15)**	**B-113 (38-40)**	**B-114 (7.5-9.5)**	**B-114 (11-13)**
				Start Depth	**13.5**	**21**	**4.5**	**38**	**8**	**13**	**38**	**7.5**	**11**
				End Depth	**15**	**23**	**5.5**	**40**	**10**	**15**	**40**	**9.5**	**13**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/25/2012**	**5/25/2012**	**5/23/2012**	**5/23/2012**	**5/22/2012**	**5/22/2012**	**5/22/2012**	**5/29/2012**	**5/29/2012**
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Diethyl phthalate		84-66-2	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Dimethyl phthalate		131-11-3	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
2,4-Dimethylphenol		105-67-9	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Di-n-butyl phthalate		84-74-2	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
4,6-Dinitro-2-methylphenol		534-52-1	NE	NE	1.2 U	1.1 U	1.4 U	1.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U
2,4-Dinitrophenol		51-28-5	NE	NE	1.2 U	1.1 U	1.4 U	1.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U
2,4-Dinitrotoluene		121-14-2	NE	NE	0.081 U	0.074 U	0.093 U	0.081 U	0.078 U	0.089 U	0.082 U	0.081 U	0.088 U
2,6-Dinitrotoluene		606-20-2	NE	NE	0.081 U	0.074 U	0.093 U	0.081 U	0.078 U	0.089 U	0.082 U	0.081 U	0.088 U
Di-n-octyl phthalate		117-84-0	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Hexachlorobenzene		118-74-1	3.2	0.3300	0.04 U	0.036 U	0.046 U	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Hexachlorobutadiene (C-46)		87-68-3	NE	NE	0.081 U	0.074 U	0.093 U	0.081 U	0.078 U	0.089 U	0.082 U	0.081 U	0.088 U
Hexachlorocyclopentadiene		77-47-4	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Hexachloroethane		67-72-1	NE	NE	0.04 U	0.036 U	0.046 U	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Isophorone		78-59-1	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
2-Methylphenol (o-Cresol)		95-48-7	0.33	0.3300	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
4-Methylphenol (p-Cresol)		106-44-5	0.33	0.3300	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
2-Nitroaniline		88-74-4	NE	NE	0.81 U	0.74 U	0.93 U	0.81 U	0.78 U	0.89 U	0.82 U	0.81 U	0.88 U
3-Nitroaniline		99-09-2	NE	NE	0.81 U	0.74 U	0.93 U	0.81 U	0.78 U	0.89 U	0.82 U	0.81 U	0.88 U
4-Nitroaniline		100-01-6	NE	NE	0.81 U	0.74 U	0.93 U	0.81 U	0.78 U	0.89 U	0.82 U	0.81 U	0.88 U
Nitrobenzene		98-95-3	NE	NE	0.04 U	0.036 U	0.046 U	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
2-Nitrophenol		88-75-5	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
4-Nitrophenol		100-02-7	NE	NE	1.2 U	1.1 U	1.4 U	1.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U
N-Nitrosodiphenylamine (NDFA)		86-30-6	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
N-Nitrosodi-n-propylamine (NDPA)		621-64-7	NE	NE	0.04 U	0.036 U	0.046 U	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
Pentachlorophenol		87-86-5	0.8	0.8000	1.2 U	1.1 U	1.4 U	1.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U
Phenol		108-95-2	0.33	0.3300	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
1,2,4-Trichlorobenzene		120-82-1	NE	NE	0.04 U	0.036 U	0.046 U	0.04 U	0.039 U	0.044 U	0.04 U	0.04 U	0.044 U
2,4,5-Trichlorophenol		95-95-4	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
2,4,6-Trichlorophenol		88-06-2	NE	NE	0.4 U	0.36 U	0.46 U	0.4 U	0.39 U	0.44 U	0.4 U	0.4 U	0.44 U
Total SVOCs (ND=0)		TSVOC_ND0	NE	NE	ND	**0.17**	**5.018**	ND	ND	ND	ND	**0.555**	ND
Total Metals	mg/kg												
Aluminum		7429-90-5	NE	NE	**345 J**	**161 J**	**220 J**	**333 J**	**292 J**	**337 J**	**318 J**	**309 J**	**308 J**
Antimony		7440-36-0	NE	NE	2.4 U	2.2 U	2.7 U	2.3 U	2.2 U	2.5 U	2.4 U	2.3 U	2.6 U
Arsenic		7440-38-2	16	13.00	1.2 U	1.1 U	1.3 U	1.1 U	**1 J**	1.2 U	**1.2**	**1.2**	1.3 U
Barium		7440-39-3	820	350.0	**1.5 J**	43.3 U	**2.6 J**	**1.5 J**	**5.3 J**	**1.5 J**	48.7 U	**2.5 J**	**2.1 J**
Beryllium		7440-41-7	47	7.200	0.47 U	0.43 U	0.54 U	0.46 U	0.45 U	0.5 U	0.49 U	0.45 U	0.52 U
Cadmium		7440-43-9	7.5	2.500	1.2 U	1.1 U	1.3 U	1.1 U	1.1 U	1.2 U	1.2 U	1.1 U	1.3 U
Calcium		7440-70-2	NE	NE	**139 J**	**7230**	**7800**	**244 J**	**214 J**	**116 J**	**434 J**	**223 J**	**204 J**

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Soil Analysis Results
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Rockaway Park, NY

				Location Name	B-111	B-111	B-112	B-112	B-113	B-113	B-113	B-114	B-114
				Sample Name	B-111(13.5-15)	B-111(21-23)	B-112 (4.5-5.5)	B-112 (38-40)	B-113 (8-10)	B-113 (13-15)	B-113 (38-40)	B-114 (7.5-9.5)	B-114 (11-13)
				Start Depth	13.5	21	4.5	38	8	13	38	7.5	11
				End Depth	15	23	5.5	40	10	15	40	9.5	13
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/25/2012	5/25/2012	5/23/2012	5/23/2012	5/22/2012	5/22/2012	5/22/2012	5/29/2012	5/29/2012
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Chromium		7440-47-3	NE	NE	**1.6 J**	**2.6**	**1.8 J**	**1.7 J**	**2 J**	**1.8 J**	**3 J**	**2 J**	**2 J**
Cobalt		7440-48-4	NE	NE	11.8 U	10.8 U	13.4 U	11.5 U	11.1 U	12.5 U	12.2 U	11.4 U	12.9 U
Copper		7440-50-8	1720	50.00	5.9 U	5.4 U	6.7 U	5.7 U	**2.7 J**	6.2 U	6.1 U	5.7 U	6.5 U
Iron		7439-89-6	NE	NE	**560**	**583**	**1210**	**765**	**1030 J**	**780 J**	**747 J**	**1060**	**665**
Lead		7439-92-1	450	63.00	1.2 U	1.1 U	**4.4**	1.1 U	**14.1**	1.2 U	1.2 U	**18.5**	1.3 U
Magnesium		7439-95-4	NE	NE	**143 J**	**109 J**	**4130**	**151 J**	**93.3 J**	**140 J**	**141 J**	**125 J**	**127 J**
Manganese		7439-96-5	2000	1600	**6.4**	**8.2**	**14**	**6.2**	**16.4 J**	**7 J**	**6.3 J**	**9.2**	**8.5**
Mercury		7439-97-6	0.73	0.1800	0.04 U	0.035 U	0.04 U	0.039 U	0.039 U	0.041 U	0.039 U	0.034 U	0.038 U
Nickel		7440-02-0	130	30.00	9.4 U	8.7 U	**1.3 J**	9.2 U	8.9 U	10 U	9.7 U	9.1 U	10.4 U
Potassium		7440-09-7	NE	NE	1180 U	1080 U	**148 J**	1150 U	1110 U	1250 U	1220 U	1140 U	1290 U
Selenium		7782-49-2	4	3.900	2.4 U	2.2 U	2.7 U	2.3 U	2.2 U	2.5 U	2.4 U	2.3 U	2.6 U
Silver		7440-22-4	8.3	2.000	2.4 U	2.2 U	2.7 U	2.3 U	2.2 U	2.5 U	2.4 U	2.3 U	2.6 U
Sodium		7440-23-5	NE	NE	1180 U	1080 U	1340 U	1150 U	1110 U	1250 U	1220 U	1140 U	1290 U
Thallium		7440-28-0	NE	NE	2.4 U	2.2 U	2.7 U	2.3 U	2.2 U	2.5 U	2.4 U	2.3 U	2.6 U
Vanadium		7440-62-2	NE	NE	**1.8 J**	**0.83 J**	**4.4 J**	**1.5 J**	**1.5 J**	**1.6 J**	**1.4 J**	**1.7 J**	**2 J**
Zinc		7440-66-6	2480	109.0	**5.5 J**	**3.9 J**	**3.3 J**	**2.5 J**	**4.8 J**	**4.4 J**	**3.4 J**	**5.3 J**	**4.7 J**
Cyanides	mg/kg												
Free Cyanide		FREECN	NE	NE	**0.23 J**	0.46 U	0.6 U	**0.91**	0.48 U	0.56 U	0.51 U	0.52 UJ	0.63 UJ
Total Cyanide		57-12-5	40	27.00	0.61 U	0.55 U	**0.45 J**	0.6 U	**0.45 J**	**0.38 J**	0.61 U	**16.3**	**2.5**

Table X. Belle Harbor
Soil Analysis Results
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				Location Name	**B-114**	**B-115**	**B-115**	**B-116**	**B-116**	**B-117**	**B-117**	**B-118**	**B-118**
				Sample Name	**B-114 (18-20)**	**B-115(1-3')**	**B-115(5-7')**	**B-116(1-3')**	**B-116(5-7')**	**B-117(1-3')**	**B-117(5-7')**	**B-118(1-3')**	**B-118(5-7')**
				Start Depth	**18**	**1**	**5**	**1**	**5**	**1**	**5**	**1**	**5**
				End Depth	**20**	**3**	**7**	**3**	**7**	**3**	**7**	**3**	**7**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/29/2012**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
BTEX	mg/kg												
Benzene		71-43-2	0.06	44	0.0012 U	**0.005 J**	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	**0.0013 J**	0.0013 UJ
Toluene		108-88-3	0.7	500	0.0012 U	**0.0028 J**	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	**0.0015 J**	0.0013 UJ
Ethylbenzene		100-41-4	1	390	0.0012 U	**0.0012 J**	0.0011 UJ	0.001 UJ	0.0013 UJ	**0.0002 J**	0.0012 UJ	0.0013 UJ	0.0013 UJ
Total Xylene		1330-20-7	1.6	500	0.0036 U	**0.0013 J**	0.0022 UJ	0.0021 UJ	0.0025 UJ	0.0022 UJ	0.0024 UJ	**0.0018 J**	0.0026 UJ
Total BTEX (ND=0)		TBTEX_ND0	NE	NE	ND	**0.0103**	ND	ND	ND	**0.0002**	ND	**0.0046**	ND
Other VOCs	mg/kg												
Acetone		67-64-1	0.05	500	0.012 U	0.018 UJ	0.0055 UJ	0.0052 UJ	0.011 UJ	0.0055 UJ	0.0061 UJ	0.0064 UJ	0.0065 UJ
Bromodichloromethane		75-27-4	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Bromoform		75-25-2	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Bromomethane		74-83-9	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Carbon disulfide		75-15-0	NE	NE	0.0012 U	**0.0024 J**	0.0011 UJ	0.001 UJ	**0.00079 J**	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Carbon tetrachloride		56-23-5	0.76	22	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Chlorobenzene		108-90-7	1.1	500	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Chloroethane		75-00-3	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Chloroform		67-66-3	0.37	350	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	**0.00024 J**	0.0012 UJ	0.0013 UJ	0.0013 UJ
Chloromethane		74-87-3	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Dibromochloromethane		124-48-1	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
1,1-Dichloroethane		75-34-3	0.27	240	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
1,2-Dichloroethane		107-06-2	0.02	30	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
1,1-Dichloroethene		75-35-4	0.33	500	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
cis-1,2-Dichloroethene		156-59-2	0.25	500	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
trans-1,2-Dichloroethene		156-60-5	0.19	500	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
1,2-Dichloropropane		78-87-5	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
cis-1,3-Dichloropropene		10061-01-5	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
trans-1,3-Dichloropropene		10061-02-6	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
2-Hexanone		591-78-6	NE	NE	0.012 U	0.0049 UJ	0.0055 UJ	0.0052 UJ	0.0063 UJ	0.0055 UJ	0.0061 UJ	0.0064 UJ	0.0065 UJ
Methyl ethyl ketone (2-Butanone)		78-93-3	0.12	500	0.012 U	0.0063 UJ	0.0055 UJ	0.0052 UJ	0.0063 UJ	0.0055 UJ	0.0061 UJ	0.0064 UJ	0.0065 UJ
4-Methyl-2-pentanone (MIBK)		108-10-1	NE	NE	0.012 U	0.0049 UJ	0.0055 UJ	0.0052 UJ	0.0063 UJ	0.0055 UJ	0.0061 UJ	0.0064 UJ	0.0065 UJ
Methylene chloride		75-09-2	0.05	500	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0013 UJ	0.0012 UJ	0.0015 UJ	0.0013 UJ
Styrene		100-42-5	NE	NE	0.0012 U	**0.0016 J**	0.0011 UJ	0.001 UJ	0.0013 UJ	**0.00063 J**	0.0012 UJ	**0.00054 J**	0.0013 UJ
1,1,2,2-Tetrachloroethane		79-34-5	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Tetrachloroethene (PCE)		127-18-4	1.3	150	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	**0.00091 J**	0.0012 UJ	0.0013 UJ	0.0013 UJ
1,1,1-Trichloroethane (TCA)		71-55-6	0.68	500	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
1,1,2-Trichloroethane		79-00-5	NE	NE	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Trichloroethene (TCE)		79-01-6	0.47	0.4700	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Vinyl chloride		75-01-4	0.02	0.02000	0.0012 U	0.00098 UJ	0.0011 UJ	0.001 UJ	0.0013 UJ	0.0011 UJ	0.0012 UJ	0.0013 UJ	0.0013 UJ
Total VOCs (ND=0)		TVOC_ND0	NE	NE	ND	**0.0143**	ND	ND	**0.00079**	**0.00198**	ND	**0.00514**	ND

Table X. Belle Harbor
Soil Analysis Results
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				Location Name	B-114	B-115	B-115	B-116	B-116	B-117	B-117	B-118	B-118
				Sample Name	B-114 (18-20)	B-115(1-3')	B-115(5-7')	B-116(1-3')	B-116(5-7')	B-117(1-3')	B-117(5-7')	B-118(1-3')	B-118(5-7')
				Start Depth	18	1	5	1	5	1	5	1	5
				End Depth	20	3	7	3	7	3	7	3	7
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/29/2012	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
PAH17	mg/kg												
Acenaphthene		83-32-9	98	20.00	0.41 U	**0.035 J**	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	**0.016 J**	0.44 U
Acenaphthylene		208-96-8	107	100.0	0.41 U	**0.51 J**	0.38 U	**0.021 J**	0.44 U	**1.1**	0.42 U	**0.088 J**	0.44 U
Anthracene		120-12-7	1000	100.0	0.41 U	**0.38 J**	0.38 U	**0.042 J**	0.44 U	**0.16 J**	0.42 U	**0.26 J**	0.44 U
Benzo(a)anthracene		56-55-3	1	1.000	0.041 U	**1.7**	0.038 U	0.034 U	0.044 U	**0.52**	0.042 U	**0.64 J**	0.044 U
Benzo(b)fluoranthene		205-99-2	1.7	1.000	0.041 U	**2.5**	0.038 U	**0.11**	0.044 U	**0.98**	0.042 U	**0.54 J**	0.044 U
Benzo(k)fluoranthene		207-08-9	1.7	0.8000	0.041 U	**1.1**	0.038 U	0.034 U	0.044 U	**0.36**	0.042 U	**0.18**	0.044 U
Benzo(g,h,i)perylene		191-24-2	1000	100.0	0.41 U	**2.9**	0.38 U	**0.045 J**	0.44 U	**0.26 J**	0.42 U	**0.24 J**	0.44 U
Benzo(a)pyrene		50-32-8	22	1.000	0.041 U	**1.3**	0.038 U	**0.061**	0.044 U	**0.16**	0.042 U	**0.3 J**	0.044 U
Chrysene		218-01-9	1	1.000	0.41 U	**2.3**	0.38 U	**0.068 J**	0.44 U	**1.2**	0.42 U	**0.73 J**	0.44 U
Dibenz(a,h)anthracene		53-70-3	1000	0.3300	0.041 U	**0.62**	0.038 U	0.034 U	0.044 UJ	0.074 U	0.042 U	**0.073 J**	0.044 UJ
Fluoranthene		206-44-0	1000	100.0	0.41 U	**1.3**	0.38 U	**0.13 J**	0.44 U	**0.65 J**	0.42 U	**0.86 J**	0.44 U
Fluorene		86-73-7	386	30.00	0.41 U	**0.11 J**	0.38 U	0.34 U	0.44 U	**0.1 J**	0.42 U	**0.16 J**	0.44 U
Indeno(1,2,3-cd)pyrene		193-39-5	8.2	0.5000	0.041 U	**2.4**	0.038 U	**0.039**	0.044 UJ	**0.24**	0.042 U	**0.23 J**	0.044 UJ
2-Methylnaphthalene		91-57-6	NE	NE	0.41 U	**0.25 J**	0.38 U	0.34 U	0.44 U	**0.49 J**	0.42 U	**0.24 J**	0.44 U
Naphthalene		91-20-3	12	12.00	0.41 U	**0.41 J**	0.38 U	0.34 U	0.44 U	**0.56 J**	0.42 U	**0.28 J**	0.44 U
Phenanthrene		85-01-8	1000	100.0	0.41 U	**0.74**	0.38 U	**0.091 J**	0.44 U	**0.48 J**	0.42 U	**0.88 J**	0.44 U
Pyrene		129-00-0	1000	100.0	0.41 U	**2.6**	0.38 U	**0.076 J**	0.44 U	**0.5 J**	0.42 U	**1.8 J**	0.44 U
Total PAH (17) (ND=0)		TPAH17_ND0	NE	NE	ND	**21.155**	ND	**0.683**	ND	**7.76**	ND	**7.517**	ND
PAH17 Other SVOCs	mg/kg												
Bis(2-chloroethoxy)methane		111-91-1	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
Bis(2-chloroethyl)ether		111-44-4	NE	NE	0.041 U	0.071 U	0.038 U	0.034 U	0.044 U	0.074 U	0.042 U	0.045 U	0.044 U
Bis(chloroisopropyl)ether		108-60-1	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
Bis(2-ethylhexyl)phthalate		117-81-7	NE	NE	0.41 U	0.71 UJ	**0.037 J**	0.34 UJ	0.44 U	0.74 UJ	0.42 UJ	0.45 U	0.44 U
4-Bromophenyl phenyl ether		101-55-3	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
Butyl benzyl phthalate		85-68-7	NE	NE	0.41 U	0.71 UJ	0.38 UJ	0.34 UJ	0.44 U	0.74 UJ	0.42 UJ	0.45 U	0.44 U
Carbazole		86-74-8	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
4-Chloro-3-methylphenol		59-50-7	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
4-Chloroaniline		106-47-8	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
2-Chloronaphthalene		91-58-7	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
2-Chlorophenol		95-57-8	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
4-Chlorophenyl phenyl ether		7005-72-3	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
Dibenzofuran		132-64-9	210	7.000	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	**0.032 J**	0.42 U	**0.016 J**	0.44 U
1,2-Dichlorobenzene		95-50-1	1.1	1.100	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
1,3-Dichlorobenzene		541-73-1	2.4	2.400	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
1,4-Dichlorobenzene		106-46-7	1.8	1.800	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
3,3-Dichlorobenzidine		91-94-1	NE	NE	0.84 U	0.28 U	0.15 U	0.14 U	0.18 U	0.3 U	0.17 U	0.18 U	0.18 U
2,4-Dichlorophenol		120-83-2	NE	NE	0.41 U	0.28 U	0.15 U	0.14 U	0.18 U	0.3 U	0.17 U	0.18 U	0.18 U

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				Location Name	**B-114**	**B-115**	**B-115**	**B-116**	**B-116**	**B-117**	**B-117**	**B-118**	**B-118**
				Sample Name	**B-114 (18-20)**	**B-115(1-3')**	**B-115(5-7')**	**B-116(1-3')**	**B-116(5-7')**	**B-117(1-3')**	**B-117(5-7')**	**B-118(1-3')**	**B-118(5-7')**
				Start Depth	**18**	**1**	**5**	**1**	**5**	**1**	**5**	**1**	**5**
				End Depth	**20**	**3**	**7**	**3**	**7**	**3**	**7**	**3**	**7**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**5/29/2012**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**	**6/22/2015**
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Diethyl phthalate		84-66-2	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
Dimethyl phthalate		131-11-3	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
2,4-Dimethylphenol		105-67-9	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
Di-n-butyl phthalate		84-74-2	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
4,6-Dinitro-2-methylphenol		534-52-1	NE	NE	1.2 U	0.57 U	0.31 U	0.28 U	0.35 U	0.59 U	0.34 U	0.36 U	0.36 U
2,4-Dinitrophenol		51-28-5	NE	NE	1.2 U	0.57 U	0.31 U	0.28 U	0.35 U	0.59 U	0.34 U	0.36 U	0.36 U
2,4-Dinitrotoluene		121-14-2	NE	NE	0.084 U	0.14 U	0.077 U	0.07 U	0.089 U	0.15 U	0.086 U	0.091 U	0.09 U
2,6-Dinitrotoluene		606-20-2	NE	NE	0.084 U	0.14 U	0.077 U	0.07 U	0.089 U	0.15 U	0.086 U	0.091 U	0.09 U
Di-n-octyl phthalate		117-84-0	NE	NE	0.41 U	0.71 UJ	0.38 UJ	0.34 UJ	0.44 U	0.74 UJ	0.42 UJ	0.45 U	0.44 U
Hexachlorobenzene		118-74-1	3.2	0.3300	0.041 U	0.071 U	0.038 U	0.034 U	0.044 U	0.074 U	0.042 U	0.045 U	0.044 U
Hexachlorobutadiene (C-46)		87-68-3	NE	NE	0.084 U	0.14 U	0.077 U	0.07 U	0.089 U	0.15 U	0.086 U	0.091 U	0.09 U
Hexachlorocyclopentadiene		77-47-4	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
Hexachloroethane		67-72-1	NE	NE	0.041 U	0.071 U	0.038 U	0.034 U	0.044 U	0.074 U	0.042 U	0.045 U	0.044 U
Isophorone		78-59-1	NE	NE	0.41 U	0.28 U	0.15 U	0.14 U	0.18 U	0.3 U	0.17 U	0.18 U	0.18 U
2-Methylphenol (o-Cresol)		95-48-7	0.33	0.3300	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
4-Methylphenol (p-Cresol)		106-44-5	0.33	0.3300	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
2-Nitroaniline		88-74-4	NE	NE	0.84 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
3-Nitroaniline		99-09-2	NE	NE	0.84 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
4-Nitroaniline		100-01-6	NE	NE	0.84 U	0.71 UJ	0.38 UJ	0.34 UJ	0.44 U	0.74 UJ	0.42 UJ	0.45 U	0.44 U
Nitrobenzene		98-95-3	NE	NE	0.041 U	0.071 U	0.038 U	0.034 U	0.044 U	0.074 U	0.042 U	0.045 U	0.044 U
2-Nitrophenol		88-75-5	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
4-Nitrophenol		100-02-7	NE	NE	1.2 U	1.4 U	0.77 U	0.7 U	0.89 U	1.5 U	0.86 U	0.91 U	0.9 U
N-Nitrosodiphenylamine (NDFA)		86-30-6	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
N-Nitrosodi-n-propylamine (NDPA)		621-64-7	NE	NE	0.041 U	0.071 U	0.038 U	0.034 U	0.044 U	0.074 U	0.042 U	0.045 U	0.044 U
Pentachlorophenol		87-86-5	0.8	0.8000	1.2 U	0.57 U	0.31 U	0.28 U	0.35 U	0.59 U	0.34 U	0.36 U	0.36 U
Phenol		108-95-2	0.33	0.3300	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
1,2,4-Trichlorobenzene		120-82-1	NE	NE	0.041 U	0.071 U	0.038 U	0.034 U	0.044 U	0.074 U	0.042 U	0.045 U	0.044 U
2,4,5-Trichlorophenol		95-95-4	NE	NE	0.41 U	0.71 U	0.38 U	0.34 U	0.44 U	0.74 U	0.42 U	0.45 U	0.44 U
2,4,6-Trichlorophenol		88-06-2	NE	NE	0.41 U	0.28 U	0.15 U	0.14 U	0.18 U	0.3 U	0.17 U	0.18 U	0.18 U
Total SVOCs (ND=0)		TSVOC_ND0	NE	NE	ND	**21.155**	**0.037**	**0.683**	ND	**7.792**	ND	**7.533**	ND
Total Metals	mg/kg												
Aluminum		7429-90-5	NE	NE	**270 J**								
Antimony		7440-36-0	NE	NE	2.4 U								
Arsenic		7440-38-2	16	13.00	1.2 U								
Barium		7440-39-3	820	350.0	48.5 U								
Beryllium		7440-41-7	47	7.200	0.48 U								
Cadmium		7440-43-9	7.5	2.500	1.2 U								
Calcium		7440-70-2	NE	NE	**480 J**								

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	B-114	B-115	B-115	B-116	B-116	B-117	B-117	B-118	B-118
				Sample Name	B-114 (18-20)	B-115(1-3')	B-115(5-7')	B-116(1-3')	B-116(5-7')	B-117(1-3')	B-117(5-7')	B-118(1-3')	B-118(5-7')
				Start Depth	18	1	5	1	5	1	5	1	5
				End Depth	20	3	7	3	7	3	7	3	7
				Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft
				Sample Date	5/29/2012	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015	6/22/2015
				Parent Sample									
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**									
Chromium		7440-47-3	NE	NE	2.4 U								
Cobalt		7440-48-4	NE	NE	12.1 U								
Copper		7440-50-8	1720	50.00	**6.3**								
Iron		7439-89-6	NE	NE	**528**								
Lead		7439-92-1	450	63.00	1.2 U								
Magnesium		7439-95-4	NE	NE	1210 U								
Manganese		7439-96-5	2000	1600	**3.5 J**								
Mercury		7439-97-6	0.73	0.1800	0.038 U								
Nickel		7440-02-0	130	30.00	9.7 U								
Potassium		7440-09-7	NE	NE	1210 U								
Selenium		7782-49-2	4	3.900	2.4 U								
Silver		7440-22-4	8.3	2.000	2.4 U								
Sodium		7440-23-5	NE	NE	1210 U								
Thallium		7440-28-0	NE	NE	2.4 U								
Vanadium		7440-62-2	NE	NE	12.1 U								
Zinc		7440-66-6	2480	109.0	**52.3**								
Cyanides	mg/kg												
Free Cyanide		FREECN	NE	NE	0.54 UJ	2.3 U	2.3 U	2.1 U	2.9 U	**31.2**	2.8 U	2.9 U	2.7 U
Total Cyanide		57-12-5	40	27.00	**5.3**	**18.7 J**	**0.6 J**	**0.55 J**	**1.4 J**	**103 J**	**0.87 J**	**1.4**	**0.35 J**

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	B-118	MW-110	MW-110	MW-110	MW-110	B-112
				Sample Name	BH-DUP-1	MW-110 S(7-9)	MW-110 S(11-13	MW-110 S(15-17	SB DUP-01	B-112(10-12)
				Start Depth	5	7	11	15	15	10
				End Depth	7	9	13	17	17	12
				Depth Unit	ft	ft	ft	ft	ft	ft
				Sample Date	6/22/2015	10/12/2012	10/12/2012	10/12/2012	10/12/2012	5/23/2012
				Parent Sample						
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**	B-118(5-7')_06/22/15				MW-110 S(15-17)_10/12/12	
BTEX	mg/kg									
Benzene		71-43-2	0.06	44	**0.00065 J**	0.0012 U	0.0012 U	0.0011 U	**0.00024 J**	0.0013 U
Toluene		108-88-3	0.7	500	**0.00062 J**	**0.00021 J**	0.0012 U	**0.00025 J**	**0.00039 J**	0.0013 U
Ethylbenzene		100-41-4	1	390	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Total Xylene		1330-20-7	1.6	500	0.0025 UJ	0.0037 U	0.0036 U	0.0033 U	0.0037 U	0.004 U
Total BTEX (ND=0)		TBTEX_ND0	NE	NE	**0.00127**	**0.00021**	ND	**0.00025**	**0.00063**	ND
Other VOCs	mg/kg									
Acetone		67-64-1	0.05	500	0.0063 UJ	**0.01 JB**	**0.0081 JB**	**0.0072 JB**	**0.0076 JB**	0.013 U
Bromodichloromethane		75-27-4	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Bromoform		75-25-2	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Bromomethane		74-83-9	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Carbon disulfide		75-15-0	NE	NE	0.0013 UJ	**0.0012**	0.0012 U	**0.0003 J**	**0.00032 J**	0.0013 U
Carbon tetrachloride		56-23-5	0.76	22	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Chlorobenzene		108-90-7	1.1	500	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Chloroethane		75-00-3	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Chloroform		67-66-3	0.37	350	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Chloromethane		74-87-3	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Dibromochloromethane		124-48-1	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
1,1-Dichloroethane		75-34-3	0.27	240	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
1,2-Dichloroethane		107-06-2	0.02	30	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
1,1-Dichloroethene		75-35-4	0.33	500	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
cis-1,2-Dichloroethene		156-59-2	0.25	500	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
trans-1,2-Dichloroethene		156-60-5	0.19	500	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
1,2-Dichloropropane		78-87-5	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
cis-1,3-Dichloropropene		10061-01-5	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
trans-1,3-Dichloropropene		10061-02-6	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
2-Hexanone		591-78-6	NE	NE	0.0063 UJ	0.012 U	0.012 U	0.011 U	0.012 U	0.013 U
Methyl ethyl ketone (2-Butanone)		78-93-3	0.12	500	0.0063 UJ	0.012 U	0.012 U	0.011 U	0.012 U	0.013 U
4-Methyl-2-pentanone (MIBK)		108-10-1	NE	NE	0.0063 UJ	0.012 U	0.012 U	0.011 U	0.012 U	0.013 U
Methylene chloride		75-09-2	0.05	500	0.0013 UJ	**0.011 B**	**0.0034 B**	**0.00086 JB**	**0.0013 B**	0.0013 U
Styrene		100-42-5	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
1,1,2,2-Tetrachloroethane		79-34-5	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Tetrachloroethene (PCE)		127-18-4	1.3	150	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
1,1,1-Trichloroethane (TCA)		71-55-6	0.68	500	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
1,1,2-Trichloroethane		79-00-5	NE	NE	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Trichloroethene (TCE)		79-01-6	0.47	0.4700	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Vinyl chloride		75-01-4	0.02	0.02000	0.0013 UJ	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U
Total VOCs (ND=0)		TVOC_ND0	NE	NE	**0.00127**	**0.02241**	**0.0115**	**0.00861**	**0.00985**	ND

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	B-118	MW-110	MW-110	MW-110	MW-110	B-112
				Sample Name	BH-DUP-1	MW-110 S(7-9)	MW-110 S(11-13	MW-110 S(15-17	SB DUP-01	B-112(10-12)
				Start Depth	5	7	11	15	15	10
				End Depth	7	9	13	17	17	12
				Depth Unit	ft	ft	ft	ft	ft	ft
				Sample Date	6/22/2015	10/12/2012	10/12/2012	10/12/2012	10/12/2012	5/23/2012
				Parent Sample						
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**	B-118(5-7')_06/22/15				MW-110 S(15-17)_10/12/12	
PAH17	mg/kg									
Acenaphthene		83-32-9	98	20.00	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Acenaphthylene		208-96-8	107	100.0	0.45 U	0.44 U	0.41 U	**0.098 J**	**0.063 J**	0.46 U
Anthracene		120-12-7	1000	100.0	0.45 U	0.44 U	0.41 U	**0.11 J**	**0.072 J**	0.46 U
Benzo(a)anthracene		56-55-3	1	1.000	0.045 U	**0.052**	**0.18**	**0.4**	**0.3**	0.046 U
Benzo(b)fluoranthene		205-99-2	1.7	1.000	0.045 U	**0.054**	**0.18**	**0.42**	**0.34**	0.046 U
Benzo(k)fluoranthene		207-08-9	1.7	0.8000	0.045 U	**0.019 J**	**0.083**	**0.19**	**0.11**	0.046 U
Benzo(g,h,i)perylene		191-24-2	1000	100.0	0.45 U	**0.046 J**	**0.13 J**	**0.38 J**	**0.26 J**	0.46 U
Benzo(a)pyrene		50-32-8	22	1.000	0.045 U	**0.049**	**0.19**	**0.38**	**0.32**	0.046 U
Chrysene		218-01-9	1	1.000	0.45 U	**0.056 J**	**0.21 J**	**0.47**	**0.35 J**	0.46 U
Dibenz(a,h)anthracene		53-70-3	1000	0.3300	0.045 UJ	0.044 U	**0.025 J**	**0.063**	**0.047**	0.046 U
Fluoranthene		206-44-0	1000	100.0	0.45 U	**0.072 J**	**0.21 J**	**0.45**	**0.33 J**	0.46 U
Fluorene		86-73-7	386	30.00	0.45 U	0.44 U	0.41 U	**0.07 J**	0.44 U	0.46 U
Indeno(1,2,3-cd)pyrene		193-39-5	8.2	0.5000	0.045 UJ	**0.043 J**	**0.15**	**0.41**	**0.29**	0.046 U
2-Methylnaphthalene		91-57-6	NE	NE	0.45 U	0.44 U	0.41 U	**0.066 J**	0.44 U	0.46 U
Naphthalene		91-20-3	12	12.00	0.45 U	0.44 U	0.41 U	**0.056 J**	0.44 U	0.46 U
Phenanthrene		85-01-8	1000	100.0	0.45 U	0.44 U	**0.16 J**	**0.46**	**0.3 J**	0.46 U
Pyrene		129-00-0	1000	100.0	0.45 U	**0.12 J**	**0.38 J**	**0.9**	**0.64**	0.46 U
Total PAH (17) (ND=0)		TPAH17_ND0	NE	NE	ND	**0.511**	**1.898**	**4.923**	**3.422**	ND
PAH17 Other SVOCs	mg/kg									
Bis(2-chloroethoxy)methane		111-91-1	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Bis(2-chloroethyl)ether		111-44-4	NE	NE	0.045 U	0.044 U	0.041 U	0.042 U	0.044 U	0.046 U
Bis(chloroisopropyl)ether		108-60-1	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Bis(2-ethylhexyl)phthalate		117-81-7	NE	NE	0.45 U	0.44 U	**0.16 J**	**0.55**	**0.39 J**	0.46 U
4-Bromophenyl phenyl ether		101-55-3	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Butyl benzyl phthalate		85-68-7	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Carbazole		86-74-8	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
4-Chloro-3-methylphenol		59-50-7	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
4-Chloroaniline		106-47-8	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
2-Chloronaphthalene		91-58-7	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
2-Chlorophenol		95-57-8	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
4-Chlorophenyl phenyl ether		7005-72-3	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Dibenzofuran		132-64-9	210	7.000	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
1,2-Dichlorobenzene		95-50-1	1.1	1.100	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
1,3-Dichlorobenzene		541-73-1	2.4	2.400	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
1,4-Dichlorobenzene		106-46-7	1.8	1.800	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
3,3-Dichlorobenzidine		91-94-1	NE	NE	0.18 U	0.9 U	0.84 U	0.86 U	0.89 U	0.93 U
2,4-Dichlorophenol		120-83-2	NE	NE	0.18 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	**B-118**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**B-112**
				Sample Name	**BH-DUP-1**	**MW-110 S(7-9)**	**IW-110 S(11-1**	**IW-110 S(15-1**	**SB DUP-01**	**B-112(10-12)**
				Start Depth	**5**	**7**	**11**	**15**	**15**	**10**
				End Depth	**7**	**9**	**13**	**17**	**17**	**12**
				Depth Unit	**ft**	**ft**	**ft**	**ft**	**ft**	**ft**
				Sample Date	**6/22/2015**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**5/23/2012**
				Parent Sample						
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**	**B-118(5-7')_06/22/15**				**MW-110 S(15-17)_10/12/12**	
Diethyl phthalate		84-66-2	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Dimethyl phthalate		131-11-3	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
2,4-Dimethylphenol		105-67-9	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Di-n-butyl phthalate		84-74-2	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
4,6-Dinitro-2-methylphenol		534-52-1	NE	NE	0.36 U	1.3 U	1.2 U	1.3 U	1.3 U	1.4 U
2,4-Dinitrophenol		51-28-5	NE	NE	0.36 U	1.3 U	1.2 U	1.3 U	1.3 U	1.4 U
2,4-Dinitrotoluene		121-14-2	NE	NE	0.091 U	0.09 U	0.084 U	0.086 U	0.089 U	0.093 U
2,6-Dinitrotoluene		606-20-2	NE	NE	0.091 U	0.09 U	0.084 U	0.086 U	0.089 U	0.093 U
Di-n-octyl phthalate		117-84-0	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Hexachlorobenzene		118-74-1	3.2	0.3300	0.045 U	0.044 U	0.041 U	0.042 U	0.044 U	0.046 U
Hexachlorobutadiene (C-46)		87-68-3	NE	NE	0.091 U	0.09 U	0.084 U	0.086 U	0.089 U	0.093 U
Hexachlorocyclopentadiene		77-47-4	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Hexachloroethane		67-72-1	NE	NE	0.045 U	0.044 U	0.041 U	0.042 U	0.044 U	0.046 U
Isophorone		78-59-1	NE	NE	0.18 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
2-Methylphenol (o-Cresol)		95-48-7	0.33	0.3300	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
4-Methylphenol (p-Cresol)		106-44-5	0.33	0.3300	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
2-Nitroaniline		88-74-4	NE	NE	0.45 U	0.9 U	0.84 U	0.86 U	0.89 U	0.93 U
3-Nitroaniline		99-09-2	NE	NE	0.45 U	0.9 U	0.84 U	0.86 U	0.89 U	0.93 U
4-Nitroaniline		100-01-6	NE	NE	0.45 U	0.9 U	0.84 U	0.86 U	0.89 U	0.93 U
Nitrobenzene		98-95-3	NE	NE	0.045 U	0.044 U	0.041 U	0.042 U	0.044 U	0.046 U
2-Nitrophenol		88-75-5	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
4-Nitrophenol		100-02-7	NE	NE	0.91 U	1.3 U	1.2 U	1.3 U	1.3 U	1.4 U
N-Nitrosodiphenylamine (NDFA)		86-30-6	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
N-Nitrosodi-n-propylamine (NDPA)		621-64-7	NE	NE	0.045 U	0.044 U	0.041 U	0.042 U	0.044 U	0.046 U
Pentachlorophenol		87-86-5	0.8	0.8000	0.36 U	1.3 U	1.2 U	1.3 U	1.3 U	1.4 U
Phenol		108-95-2	0.33	0.3300	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
1,2,4-Trichlorobenzene		120-82-1	NE	NE	0.045 U	0.044 U	0.041 U	0.042 U	0.044 U	0.046 U
2,4,5-Trichlorophenol		95-95-4	NE	NE	0.45 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
2,4,6-Trichlorophenol		88-06-2	NE	NE	0.18 U	0.44 U	0.41 U	0.42 U	0.44 U	0.46 U
Total SVOCs (ND=0)		TSVOC_ND0	NE	NE	ND	**0.511**	**2.058**	**5.473**	**3.812**	ND
Total Metals	mg/kg									
Aluminum		7429-90-5	NE	NE		**820**	**327**	**388**	**282**	**139 J**
Antimony		7440-36-0	NE	NE		2.4 U	2.4 U	2.2 U	2.6 U	2.7 U
Arsenic		7440-38-2	16	13.00		1.2 U	1.2 U	1.1 U	1.3 U	1.3 U
Barium		7440-39-3	820	350.0		**4.5 J**	**1.4 J**	**3.5 J**	**2.2 J**	53.3 U
Beryllium		7440-41-7	47	7.200		0.48 U	0.48 U	0.45 U	0.52 U	0.53 U
Cadmium		7440-43-9	7.5	2.500		1.2 U	1.2 U	1.1 U	1.3 U	1.3 U
Calcium		7440-70-2	NE	NE		**300 J**	**180 J**	**305 J**	**245 J**	1330 U

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

				Location Name	B-118	MW-110	MW-110	MW-110	MW-110	B-112
				Sample Name	BH-DUP-1	MW-110 S(7-9)	MW-110 S(11-13	MW-110 S(15-17	SB DUP-01	B-112(10-12)
				Start Depth	5	7	11	15	15	10
				End Depth	7	9	13	17	17	12
				Depth Unit	ft	ft	ft	ft	ft	ft
				Sample Date	6/22/2015	10/12/2012	10/12/2012	10/12/2012	10/12/2012	5/23/2012
				Parent Sample						
Analyte	**Units**	**CAS No.**	**Protection of Groundwater SCO**	**Commercial SCO**	B-118(5-7')_06/22/15				MW-110 S(15-17)_10/12/12	
Chromium		7440-47-3	NE	NE		**2.8**	**2.4**	**2.3**	**1.6 J**	2.7 U
Cobalt		7440-48-4	NE	NE		12 U	11.9 U	11.1 U	13 U	13.3 U
Copper		7440-50-8	1720	50.00		6 U	**2.3 J**	5.6 U	6.5 U	6.7 U
Iron		7439-89-6	NE	NE		**1940**	**650**	**1180**	**914**	**229**
Lead		7439-92-1	450	63.00		**2.9**	**1.8**	**4.4**	**2.6**	**1.1 J**
Magnesium		7439-95-4	NE	NE		**313 J**	**108 J**	**185 J**	**134 J**	1330 U
Manganese		7439-96-5	2000	1600		**14.9**	**7**	**10.4**	**7.3**	**2.6 J**
Mercury		7439-97-6	0.73	0.1800		0.043 U	0.041 U	0.041 U	0.042 U	0.039 U
Nickel		7440-02-0	130	30.00		**2.5 J**	**1.3 J**	**1.5 J**	10.4 U	10.7 U
Potassium		7440-09-7	NE	NE		**232 J**	1190 U	1110 U	1300 U	1330 U
Selenium		7782-49-2	4	3.900		2.4 U	2.4 U	2.2 U	2.6 U	2.7 U
Silver		7440-22-4	8.3	2.000		2.4 U	2.4 U	2.2 U	2.6 U	2.7 U
Sodium		7440-23-5	NE	NE		1200 U	1190 U	1110 U	1300 U	1330 U
Thallium		7440-28-0	NE	NE		2.4 U	2.4 U	2.2 U	2.6 U	2.7 U
Vanadium		7440-62-2	NE	NE		**2.7 J**	**1.3 J**	**2.2 J**	**1.5 J**	13.3 U
Zinc		7440-66-6	2480	109.0		**11**	**12.4**	**8**	**15.3**	**1.7 J**
Cyanides	mg/kg									
Free Cyanide		FREECN	NE	NE	2.9 U	**0.35 J**	2.6 U	**0.16 J**	**0.35 J**	0.57 U
Total Cyanide		57-12-5	40	27.00	**1.8 J**	**1.6 B**	**9.7 B**	**7.9 B**	**9.6 B**	0.69 U

Table X. Belle Harbor
Soil Analysis Results
National Grid
Rockaway Park, NY

Notes:
Analytes in blue are not detected in any sample
mg/kg = milligrams/kilogram or parts per million (ppm)

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
PAH = Polycyclic Aromatic Hydrocarbon
SVOC = Semi-Volatile Organic Compound
VOC = Volatile Organic Compound

Total BTEX, Total VOCs, Total PAHs, and Total SVOCs are calculated using detects only.
Total PAH16 is calculated using the EPA16 list of analytes: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenz[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-cd]pyrene, Naphthalene, Phenanthrene, and Pyrene
Total PAH17 is calculated using the EPA16 list of analytes plus 2-Methylnaphthalene

6 NYCRR = New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York
Comparison of detected results are performed against one or more of the following NYCRR, Chapter IV, Part 375-6 Soil Cleanup Objectives (SCO)s: Unrestricted Use, Residential, Restricted-Residential, Commercial, Industrial, Protection of Ecological Resources, or Protection of Groundwater
* 500 ppm total PAH SCO for non-residential sites (Commercial), per NYSDEC CP-51 / Soil Cleanup Guidance, Section V(H).

CAS No. = Chemical Abstracts Service Number
MGP = Manufactured Gas Plant
ND = Not Detected
NE = Not Established
NYSDEC = New York State Department of Environmental Conservation

Bolding indicates a detected result concentration
Shading and bolding indicates that the detected concentration is above the NYSDOH guidance it was compared to
Gray shading and bolding indicates that the detected result value exceeds the Unrestricted SCO
Yellow shading and bolding indicates that the detected result value exceeds the Commercial SCO

Validation Qualifiers:
B = The analyte was detected in the associated method blank.
J = The result is an estimated value.
U = The result was not detected above the reporting limit .
UJ = The results was not detected at or above the reporting limit shown and the reporting limit is estimated.

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-105	B-105	B-105	B-105	B-105	B-106	B-106
		Sample Name	B-105GW (6-10)	B-105GW (16-20)	GWDUP-01	B-105GW (26-30)	B-105GW (36-40)	B-106GW(5-9)	B-106GW(12-16)
		Start Depth	6	16	16	26	36	5	12
		End Depth	10	20	20	30	40	9	16
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/24/2012	5/24/2012	5/24/2012	5/24/2012	5/23/2012	5/25/2012	5/25/2012
		Parent Sample Code			B-105GW (16-20)				
Analyte	CAS no.	NYS AWQS							
BTEX (ug/L)									
Benzene	71-43-2	1	**0.17 J**	1 U	1 U	1 U	1 U	**73**	**740**
Toluene	108-88-3	5	1 U	1 U	1 U	1 U	1 U	**11**	**4700**
Ethylbenzene	100-41-4	5	**0.11 J**	1 U	1 U	1 U	1 U	**290**	**1900**
Total Xylene	1330-20-7	5	3 U	3 U	3 U	3 U	3 U	**110**	**2400**
Total BTEX		NE	**0.28**	ND	ND	ND	ND	**484**	**9740**
Other VOCs (ug/L)									
Acetone	67-64-1	50*	5 U	5 U	5 U	5 U	5 U	5 U	250 U
Bromodichloromethane	75-27-4	50*	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Bromoform	75-25-2	50*	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Bromomethane	74-83-9	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Carbon disulfide	75-15-0	60*	1 U	1 U	1 U	1 U	**0.37 J**	**0.14 J**	50 U
Carbon tetrachloride	56-23-5	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Chlorobenzene	108-90-7	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Chloroethane	75-00-3	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Chloroform	67-66-3	7	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Chloromethane	74-87-3	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Dibromochloromethane	124-48-1	50*	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,1-Dichloroethane	75-34-3	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,2-Dichloroethane	107-06-2	0.6	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,1-Dichloroethene	75-35-4	0.07	1 U	1 U	1 U	1 U	1 U	1 U	50 U
cis-1,2-Dichloroethene	156-59-2	5	1 U	1 U	1 U	1 U	1 U	**0.25 J**	50 U
trans-1,2-Dichloroethene	156-60-5	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,2-Dichloropropane	78-87-5	1	1 U	1 U	1 U	1 U	1 U	1 U	50 U
cis-1,3-Dichloropropene	10061-01-5	0.4	1 U	1 U	1 U	1 U	1 U	1 U	50 U
trans-1,3-Dichloropropene	10061-02-6	0.4	1 U	1 U	1 U	1 U	1 U	1 U	50 U
2-Hexanone	591-78-6	50*	5 U	5 U	5 U	5 U	5 U	5 U	250 U
Methyl ethyl ketone (2-Butanone)	78-93-3	50*	5 U	5 U	5 U	5 U	5 U	5 U	250 U
4-Methyl-2-pentanone (MIBK)	108-10-1	NE	5 U	5 U	5 U	5 U	5 U	5 U	250 U
Methylene chloride	75-09-2	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Styrene	100-42-5	5	**0.17 J**	1 U	1 U	1 U	1 U	**2**	**1200**
1,1,2,2-Tetrachloroethane	79-34-5	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Tetrachloroethene (PCE)	127-18-4	5	**0.56 J**	1 U	1 U	1 U	1 U	1 U	50 U
1,1,1-Trichloroethane	71-55-6	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,1,2-Trichloroethane	79-00-5	1	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Trichloroethene (TCE)	79-01-6	5	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Vinyl chloride	75-01-4	2	1 U	1 U	1 U	1 U	1 U	**0.28 J**	50 U
Total VOCs		NE	**1.01**	ND	ND	ND	**0.37**	**486.67**	**10940**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-105	B-105	B-105	B-105	B-105	B-106	B-106
		Sample Name	B-105GW (6-10)	B-105GW (16-20)	GWDUP-01	B-105GW (26-30)	B-105GW (36-40)	B-106GW(5-9)	B-106GW(12-16)
		Start Depth	6	16	16	26	36	5	12
		End Depth	10	20	20	30	40	9	16
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/24/2012	5/24/2012	5/24/2012	5/24/2012	5/23/2012	5/25/2012	5/25/2012
		Parent Sample Code			B-105GW (16-20)				
Analyte	CAS no.	NYS AWQS							
NYSDEC PAH17 (µg/L)									
Acenaphthene	83-32-9	20*	10 U	10 U	10 U	10 U	10 U	**18**	**140 J**
Acenaphthylene	208-96-8	NE	10 U	10 U	10 U	10 U	10 U	10 U	**250 J**
Anthracene	120-12-7	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Benzo(a)anthracene	56-55-3	0.002*	**0.7 J**	1 U	1 U	1 U	1 U	1 U	51 U
Benzo(b)fluoranthene	205-99-2	0.002*	**1**	1 U	1 U	1 U	1 U	1 U	51 U
Benzo(k)fluoranthene	207-08-9	0.002*	**0.44 J**	1 U	1 U	1 U	1 U	1 U	51 U
Benzo(g,h,i)perylene	191-24-2	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Benzo(a)pyrene	50-32-8	ND	**0.87 J**	1 U	1 U	1 U	1 U	1 U	51 U
Chrysene	218-01-9	0.002*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Dibenz(a,h)anthracene	53-70-3	NE	1 U	1 U	1 U	1 U	1 U	1 U	51 U
Fluoranthene	206-44-0	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Fluorene	86-73-7	50*	10 U	10 U	10 U	10 U	10 U	**6.1 J**	510 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.002*	**0.63 J**	1 U	1 U	1 U	1 U	1 U	51 U
2-Methylnaphthalene	91-57-6	NE	10 U	10 U	10 U	10 U	10 U	**5.2 J**	**1100**
Naphthalene	91-20-3	10*	10 U	10 U	10 U	10 U	10 U	**79**	**7400**
Phenanthrene	85-01-8	50*	10 U	10 U	10 U	10 U	10 U	**3.2 J**	510 U
Pyrene	129-00-0	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Total PAHs		NE	**3.64**	ND	ND	ND	ND	**111.5**	**8890**
NYSDEC PAH17 Other SVOCs (µg/L)									
Bis(2-chloroethoxy)methane	111-91-1	5	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Bis(2-chloroethyl)ether	111-44-4	1	1 U	1 U	1 U	1 U	1 U	1 U	51 U
Bis(chloroisopropyl)ether	108-60-1	5	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Bis(2-ethylhexyl)phthalate	117-81-7	5	10 U	10 U	10 U	10 U	10 U	10 U	510 U
4-Bromophenyl phenyl ether	101-55-3	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Butyl benzyl phthalate	85-68-7	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Carbazole	86-74-8	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
4-Chloro-3-methylphenol	59-50-7	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
4-Chloroaniline	106-47-8	5	10 U	10 U	10 U	10 U	10 U	10 U	510 U
2-Chloronaphthalene	91-58-7	10*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
2-Chlorophenol	95-57-8	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
4-Chlorophenyl phenyl ether	7005-72-3	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Dibenzofuran	132-64-9	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
1,2-Dichlorobenzene	95-50-1	3	10 U	10 U	10 U	10 U	10 U	10 U	510 U
1,3-Dichlorobenzene	541-73-1	3	10 U	10 U	10 U	10 U	10 U	10 U	510 U
1,4-Dichlorobenzene	106-46-7	3	10 U	10 U	10 U	10 U	10 U	10 U	510 U
3,3-Dichlorobenzidine	91-94-1	5	20 U	20 U	20 U	20 U	20 U	20 U	1000 U
2,4-Dichlorophenol	120-83-2	5	10 U	10 U	10 U	10 U	10 U	10 U	510 U

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-105	B-105	B-105	B-105	B-105	B-106	B-106
		Sample Name	B-105GW (6-10)	B-105GW (16-20)	GWDUP-01	B-105GW (26-30)	B-105GW (36-40)	B-106GW(5-9)	B-106GW(12-16)
		Start Depth	6	16	16	26	36	5	12
		End Depth	10	20	20	30	40	9	16
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/24/2012	5/24/2012	5/24/2012	5/24/2012	5/23/2012	5/25/2012	5/25/2012
		Parent Sample Code			B-105GW (16-20)				
Analyte	CAS no.	NYS AWQS							
Diethyl phthalate	84-66-2	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Dimethyl phthalate	131-11-3	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
2,4-Dimethylphenol	105-67-9	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Di-n-butyl phthalate	84-74-2	50	10 U	10 U	10 U	10 U	10 U	10 U	510 U
4,6-Dinitro-2-methylphenol	534-52-1	NE	30 U	30 U	30 U	30 U	30 U	31 U	1500 U
2,4-Dinitrophenol	51-28-5	10*	30 U	30 U	30 U	30 U	30 U	31 U	1500 U
2,4-Dinitrotoluene	121-14-2	5	2 U	2 U	2 U	2 U	2 U	2 U	100 U
2,6-Dinitrotoluene	606-20-2	5	2 U	2 U	2 U	2 U	2 U	2 U	100 U
Di-n-octyl phthalate	117-84-0	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Hexachlorobenzene	118-74-1	0.04	1 U	1 U	1 U	1 U	1 U	1 U	51 U
Hexachlorobutadiene	87-68-3	0.5	2 U	2 U	2 U	2 U	2 U	2 U	100 U
Hexachlorocyclopentadiene	77-47-4	5	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Hexachloroethane	67-72-1	5	1 U	1 U	1 U	1 U	1 U	1 U	51 U
Isophorone	78-59-1	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
2-Methylphenol (o-Cresol)	95-48-7	1	10 U	10 U	10 U	10 U	10 U	10 U	510 U
4-Methylphenol (p-Cresol)	106-44-5	1	10 U	10 U	10 U	10 U	10 U	10 U	510 U
2-Nitroaniline	88-74-4	5	20 U	20 U	20 U	20 U	20 U	20 U	1000 U
3-Nitroaniline	99-09-2	5	20 U	20 U	20 U	20 U	20 U	20 U	1000 U
4-Nitroaniline	100-01-6	5	20 U	20 U	20 U	20 U	20 U	20 U	1000 U
Nitrobenzene	98-95-3	0.4	1 U	1 U	1 U	1 U	1 U	1 U	51 U
2-Nitrophenol	88-75-5	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
4-Nitrophenol	100-02-7	NE	30 U	30 U	30 U	30 U	30 U	31 U	1500 U
N-Nitrosodi-n-propylamine	621-64-7	NE	1 U	1 U	1 U	1 U	1 U	1 U	51 U
N-Nitrosodiphenylamine	86-30-6	50*	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Pentachlorophenol	87-86-5	1	30 U	30 U	30 U	30 U	30 U	31 U	1500 U
Phenol	108-95-2	1	10 U	10 U	10 U	10 U	10 U	10 U	510 U
1,2,4-Trichlorobenzene	120-82-1	5	1 U	1 U	1 U	1 U	1 U	1 U	51 U
2,4,5-Trichlorophenol	95-95-4	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
2,4,6-Trichlorophenol	88-06-2	NE	10 U	10 U	10 U	10 U	10 U	10 U	510 U
Total SVOCs		NE	**3.64**	ND	ND	ND	ND	**111.5**	**8890**
Total Metals (ug/L)									
Aluminum	7429-90-5	NE	**305**	**671**	**720**	**590**	**1730**	**183 J**	**225**
Antimony	7440-36-0	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Arsenic	7440-38-2	25	5 U	**4 J**	5 U	**12.9**	**6.6**	5 U	5 U
Barium	7440-39-3	1000	**36.3 J**	**6.9 J**	**7.4 J**	**6.4 J**	**17.2 J**	**42.2 J**	**34.2 J**
Beryllium	7440-41-7	3*	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	7440-43-9	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Calcium	7440-70-2	NE	**77000**	**14400**	**14500**	**22500**	**36400**	**178000**	**128000**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-105	B-105	B-105	B-105	B-105	B-106	B-106
		Sample Name	B-105GW (6-10)	B-105GW (16-20)	GWDUP-01	B-105GW (26-30)	B-105GW (36-40)	B-106GW(5-9)	B-106GW(12-16)
		Start Depth	6	16	16	26	36	5	12
		End Depth	10	20	20	30	40	9	16
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/24/2012	5/24/2012	5/24/2012	5/24/2012	5/23/2012	5/25/2012	5/25/2012
		Parent Sample Code			B-105GW (16-20)				
Analyte	CAS no.	NYS AWQS							
Chromium	7440-47-3	50	10 U	**10.1**	**9.7 J**	**38.6**	**142**	10 U	**18.4**
Cobalt	7440-48-4	NE	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Copper	7440-50-8	200	25 U	**13.8 J**	**11.4 J**	25 U	**26.1**	25 U	25 U
Iron	7439-89-6	300	**6290**	**3320**	**3170**	**1680**	**6070**	**5300**	**3020**
Lead	7439-92-1	25	**11.3**	5 U	5 U	5 U	**6.1**	**4.2 J**	5 U
Magnesium	7439-95-4	35000*	**24800**	**1650 J**	**1670 J**	**3530 J**	**4570 J**	**18000**	**12500**
Manganese	7439-96-5	300	**111**	**31.6**	**31.6**	**46.1**	**101**	**314**	**276**
Mercury	7439-97-6	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	7440-02-0	100	**18 J**	40 U	40 U	**19.6 J**	**69.2**	**6.2 J**	40 U
Potassium	7440-09-7	NE	**4300 J**	**1770 J**	**1870 J**	**3020 J**	**5190**	**14700**	**11000**
Selenium	7782-49-2	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Silver	7440-22-4	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	7440-23-5	20000	**30200**	**4530 J**	**4560 J**	**5310**	**9120**	**131000**	**103000**
Thallium	7440-28-0	0.5*	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vanadium	7440-62-2	NE	50 U	50 U	50 U	50 U	**4.1 J**	50 U	**4 J**
Zinc	7440-66-6	2000*	**127**	**134**	**127**	**86.3**	**391**	**36.5**	**27 J**
Total Cyanide (µg/L)									
Total Cyanide	57-12-5	200	**180**	**11**	**13**	**2.9 J**	**5.7 J**	**940**	**830**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-106	B-106	B-109	B-109	B-109	B-109	MW-108
		Sample Name	B-106GW(18-22)	B-106GW(36-40)	B-109GW(6-10)	B-109GW(16-20)	B-109GW(26-30)	B-109GW(36-40)	MW-108S
		Start Depth	18	36	6	16	26	36	5
		End Depth	22	40	10	20	30	40	20
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/25/2012	5/25/2012	5/24/2012	5/24/2012	5/24/2012	5/24/2012	1/23/2013
		Parent Sample Code							
Analyte	CAS no.	NYS AWQS							
BTEX (ug/L)									
Benzene	71-43-2	1	**92**	**2.6**	1 U	1 U	1 U	1 U	**540**
Toluene	108-88-3	5	**910**	**23**	1 U	1 U	1 U	1 U	**1400**
Ethylbenzene	100-41-4	5	**530**	**11**	1 U	1 U	1 U	1 U	**550**
Total Xylene	1330-20-7	5	**330**	**5.2**	3 U	3 U	3 U	3 U	**690**
Total BTEX		NE	**1862**	**41.8**	ND	ND	ND	ND	**3180**
Other VOCs (ug/L)									
Acetone	67-64-1	50*	25 U	5 U	5 U	5 U	5 U	5 U	25 U
Bromodichloromethane	75-27-4	50*	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Bromoform	75-25-2	50*	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Bromomethane	74-83-9	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Carbon disulfide	75-15-0	60*	5 U	1 U	1 U	1 U	1 U	**0.27 J**	5 U
Carbon tetrachloride	56-23-5	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Chlorobenzene	108-90-7	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Chloroethane	75-00-3	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Chloroform	67-66-3	7	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Chloromethane	74-87-3	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Dibromochloromethane	124-48-1	50*	5 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1-Dichloroethane	75-34-3	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
1,2-Dichloroethane	107-06-2	0.6	5 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1-Dichloroethene	75-35-4	0.07	5 U	1 U	1 U	1 U	1 U	1 U	5 U
cis-1,2-Dichloroethene	156-59-2	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
trans-1,2-Dichloroethene	156-60-5	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
1,2-Dichloropropane	78-87-5	1	5 U	1 U	1 U	1 U	1 U	1 U	5 U
cis-1,3-Dichloropropene	10061-01-5	0.4	5 U	1 U	1 U	1 U	1 U	1 U	5 U
trans-1,3-Dichloropropene	10061-02-6	0.4	5 U	1 U	1 U	1 U	1 U	1 U	5 U
2-Hexanone	591-78-6	50*	25 U	5 U	5 U	5 U	5 U	5 U	25 U
Methyl ethyl ketone (2-Butanone)	78-93-3	50*	25 U	5 U	5 U	5 U	5 U	5 U	25 U
4-Methyl-2-pentanone (MIBK)	108-10-1	NE	25 U	5 U	5 U	5 U	5 U	5 U	25 U
Methylene chloride	75-09-2	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Styrene	100-42-5	5	**23**	**0.14 J**	1 U	1 U	1 U	1 U	**310**
1,1,2,2-Tetrachloroethane	79-34-5	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Tetrachloroethene (PCE)	127-18-4	5	5 U	**0.11 J**	**0.35 J**	1 U	1 U	1 U	5 U
1,1,1-Trichloroethane	71-55-6	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1,2-Trichloroethane	79-00-5	1	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Trichloroethene (TCE)	79-01-6	5	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Vinyl chloride	75-01-4	2	5 U	1 U	1 U	1 U	1 U	1 U	5 U
Total VOCs		NE	**1885**	**42.05**	**0.35**	ND	ND	**0.27**	**3490**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-106	B-106	B-109	B-109	B-109	B-109	MW-108
		Sample Name	B-106GW(18-22)	B-106GW(36-40)	B-109GW(6-10)	B-109GW(16-20)	B-109GW(26-30)	B-109GW(36-40)	MW-108S
		Start Depth	18	36	6	16	26	36	5
		End Depth	22	40	10	20	30	40	20
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/25/2012	5/25/2012	5/24/2012	5/24/2012	5/24/2012	5/24/2012	1/23/2013
		Parent Sample Code							
Analyte	CAS no.	NYS AWQS							
NYSDEC PAH17 (µg/L)									
Acenaphthene	83-32-9	20*	**52**	10 U	10 U	10 U	10 U	10 U	**59 J**
Acenaphthylene	208-96-8	NE	51 U	10 U	10 U	10 U	10 U	10 U	**71 J**
Anthracene	120-12-7	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Benzo(a)anthracene	56-55-3	0.002*	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Benzo(b)fluoranthene	205-99-2	0.002*	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Benzo(k)fluoranthene	207-08-9	0.002*	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Benzo(g,h,i)perylene	191-24-2	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Benzo(a)pyrene	50-32-8	ND	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Chrysene	218-01-9	0.002*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Dibenz(a,h)anthracene	53-70-3	NE	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Fluoranthene	206-44-0	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Fluorene	86-73-7	50*	**16 J**	10 U	10 U	10 U	10 U	10 U	100 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.002*	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
2-Methylnaphthalene	91-57-6	NE	**32 J**	10 U	10 U	10 U	10 U	10 U	**220**
Naphthalene	91-20-3	10*	**850**	**22**	10 U	10 U	10 U	10 U	**1300**
Phenanthrene	85-01-8	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Pyrene	129-00-0	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Total PAHs		NE	**950**	**22**	ND	ND	ND	ND	**1650**
NYSDEC PAH17 Other SVOCs (µg/L)									
Bis(2-chloroethoxy)methane	111-91-1	5	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Bis(2-chloroethyl)ether	111-44-4	1	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Bis(chloroisopropyl)ether	108-60-1	5	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Bis(2-ethylhexyl)phthalate	117-81-7	5	51 U	10 U	10 U	10 U	10 U	10 U	100 U
4-Bromophenyl phenyl ether	101-55-3	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Butyl benzyl phthalate	85-68-7	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Carbazole	86-74-8	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
4-Chloro-3-methylphenol	59-50-7	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
4-Chloroaniline	106-47-8	5	51 U	10 U	10 U	10 U	10 U	10 U	100 U
2-Chloronaphthalene	91-58-7	10*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
2-Chlorophenol	95-57-8	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
4-Chlorophenyl phenyl ether	7005-72-3	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Dibenzofuran	132-64-9	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
1,2-Dichlorobenzene	95-50-1	3	51 U	10 U	10 U	10 U	10 U	10 U	100 U
1,3-Dichlorobenzene	541-73-1	3	51 U	10 U	10 U	10 U	10 U	10 U	100 U
1,4-Dichlorobenzene	106-46-7	3	51 U	10 U	10 U	10 U	10 U	10 U	100 U
3,3-Dichlorobenzidine	91-94-1	5	100 U	20 U	20 U	20 U	20 U	20 U	200 U
2,4-Dichlorophenol	120-83-2	5	51 U	10 U	10 U	10 U	10 U	10 U	100 U

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-106	B-106	B-109	B-109	B-109	B-109	MW-108
		Sample Name	B-106GW(18-22)	B-106GW(36-40)	B-109GW(6-10)	B-109GW(16-20)	B-109GW(26-30)	B-109GW(36-40)	MW-108S
		Start Depth	18	36	6	16	26	36	5
		End Depth	22	40	10	20	30	40	20
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/25/2012	5/25/2012	5/24/2012	5/24/2012	5/24/2012	5/24/2012	1/23/2013
		Parent Sample Code							
Analyte	CAS no.	NYS AWQS							
Diethyl phthalate	84-66-2	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Dimethyl phthalate	131-11-3	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
2,4-Dimethylphenol	105-67-9	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Di-n-butyl phthalate	84-74-2	50	51 U	10 U	10 U	10 U	10 U	10 U	100 U
4,6-Dinitro-2-methylphenol	534-52-1	NE	150 U	31 U	31 U	31 U	31 U	31 U	300 U
2,4-Dinitrophenol	51-28-5	10*	150 U	31 U	31 U	31 U	31 U	31 U	300 U
2,4-Dinitrotoluene	121-14-2	5	10 U	2 U	2 U	2 U	2 U	2 U	20 U
2,6-Dinitrotoluene	606-20-2	5	10 U	2 U	2 U	2 U	2 U	2 U	20 U
Di-n-octyl phthalate	117-84-0	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Hexachlorobenzene	118-74-1	0.04	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Hexachlorobutadiene	87-68-3	0.5	10 U	2 U	2 U	2 U	2 U	2 U	20 U
Hexachlorocyclopentadiene	77-47-4	5	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Hexachloroethane	67-72-1	5	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
Isophorone	78-59-1	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
2-Methylphenol (o-Cresol)	95-48-7	1	51 U	10 U	10 U	10 U	10 U	10 U	100 U
4-Methylphenol (p-Cresol)	106-44-5	1	51 U	10 U	10 U	10 U	10 U	10 U	100 U
2-Nitroaniline	88-74-4	5	100 U	20 U	20 U	20 U	20 U	20 U	200 U
3-Nitroaniline	99-09-2	5	100 U	20 U	20 U	20 U	20 U	20 U	200 U
4-Nitroaniline	100-01-6	5	100 U	20 U	20 U	20 U	20 U	20 U	200 U
Nitrobenzene	98-95-3	0.4	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
2-Nitrophenol	88-75-5	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
4-Nitrophenol	100-02-7	NE	150 U	31 U	31 U	31 U	31 U	31 U	300 U
N-Nitrosodi-n-propylamine	621-64-7	NE	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
N-Nitrosodiphenylamine	86-30-6	50*	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Pentachlorophenol	87-86-5	1	150 U	31 U	31 U	31 U	31 U	31 U	300 U
Phenol	108-95-2	1	51 U	10 U	10 U	10 U	10 U	10 U	100 U
1,2,4-Trichlorobenzene	120-82-1	5	5.1 U	1 U	1 U	1 U	1 U	1 U	10 U
2,4,5-Trichlorophenol	95-95-4	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
2,4,6-Trichlorophenol	88-06-2	NE	51 U	10 U	10 U	10 U	10 U	10 U	100 U
Total SVOCs		NE	**950**	**22**	ND	ND	ND	ND	**1650**
Total Metals (ug/L)									
Aluminum	7429-90-5	NE	200 U	**649**	200 U	**73.2 J**	200 U	**1780**	**75.9 J**
Antimony	7440-36-0	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Arsenic	7440-38-2	25	5 U	5 U	**5**	5 U	5 U	5 U	**4.4 J**
Barium	7440-39-3	1000	200 U	**14.5 J**	**44.1 J**	200 U	200 U	**17.8 J**	**8.7 J**
Beryllium	7440-41-7	3*	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	7440-43-9	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Calcium	7440-70-2	NE	**59900**	**48700**	**154000**	**23200**	**66500**	**53800**	**95900**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	B-106	B-106	B-109	B-109	B-109	B-109	MW-108
		Sample Name	B-106GW(18-22)	B-106GW(36-40)	B-109GW(6-10)	B-109GW(16-20)	B-109GW(26-30)	B-109GW(36-40)	MW-108S
		Start Depth	18	36	6	16	26	36	5
		End Depth	22	40	10	20	30	40	20
		Depth Unit	ft	ft	ft	ft	ft	ft	ft
		Sample Date	5/25/2012	5/25/2012	5/24/2012	5/24/2012	5/24/2012	5/24/2012	1/23/2013
		Parent Sample Code							
Analyte	CAS no.	NYS AWQS							
Chromium	7440-47-3	50	**5.2 J**	**24.9**	10 U	10 U	10 U	**104**	10 U
Cobalt	7440-48-4	NE	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Copper	7440-50-8	200	25 U	**9.6 J**	25 U	25 U	25 U	**23.3 J**	25 U
Iron	7439-89-6	300	**1720**	**8260**	**1170**	**405**	**1550**	**9170**	**5940**
Lead	7439-92-1	25	5 U	**4.2 J**	5 U	5 U	5 U	**4.5 J**	**6.2**
Magnesium	7439-95-4	35000*	**3650 J**	**8590**	**16000**	**8880**	**13000**	**28000**	**12300**
Manganese	7439-96-5	300	**105**	**173**	**77.8**	**22.3**	**70.7**	**145**	**213**
Mercury	7439-97-6	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	7440-02-0	100	40 U	**14.5 J**	40 U	40 U	40 U	**38.7 J**	40 U
Potassium	7440-09-7	NE	**3140 J**	**5550**	**2850 J**	**6850**	**6670**	**10800**	**6650**
Selenium	7782-49-2	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Silver	7440-22-4	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	7440-23-5	20000	**35300**	**25700**	**102000**	**8430**	**46600**	**171000**	**96800**
Thallium	7440-28-0	0.5*	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vanadium	7440-62-2	NE	50 U	50 U	50 U	50 U	50 U	**5.2 J**	50 U
Zinc	7440-66-6	2000*	**22.1 J**	**122**	**220**	30 U	**28.7 J**	**105**	30 U
Total Cyanide (µg/L)									
Total Cyanide	57-12-5	200	**170**	10 U	**1300**	**2.4 J**	10 U	10 U	**530**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	MW-108	MW-109	MW-110
		Sample Name	DUP-BH01	MW-109S	MW-110S
		Start Depth	5	5	5
		End Depth	20	15	20
		Depth Unit	ft	ft	ft
		Sample Date	1/23/2013	1/23/2013	1/23/2013
		Parent Sample Code	MW-108S		
Analyte	CAS no.	NYS AWQS			
BTEX (ug/L)					
Benzene	71-43-2	1	**570**	1 U	1 U
Toluene	108-88-3	5	**1400**	1 U	1 U
Ethylbenzene	100-41-4	5	**580**	1 U	1 U
Total Xylene	1330-20-7	5	**720**	3 U	3 U
Total BTEX		NE	**3270**	ND	ND
Other VOCs (ug/L)					
Acetone	67-64-1	50*	25 U	5 U	5 U
Bromodichloromethane	75-27-4	50*	5 U	1 U	1 U
Bromoform	75-25-2	50*	5 U	1 U	1 U
Bromomethane	74-83-9	5	5 U	1 U	1 U
Carbon disulfide	75-15-0	60*	5 U	1 U	1 U
Carbon tetrachloride	56-23-5	5	5 U	1 U	1 U
Chlorobenzene	108-90-7	5	5 U	1 U	1 U
Chloroethane	75-00-3	5	5 U	1 U	1 U
Chloroform	67-66-3	7	5 U	1 U	1 U
Chloromethane	74-87-3	5	5 U	1 U	1 U
Dibromochloromethane	124-48-1	50*	5 U	1 U	1 U
1,1-Dichloroethane	75-34-3	5	5 U	1 U	1 U
1,2-Dichloroethane	107-06-2	0.6	5 U	1 U	1 U
1,1-Dichloroethene	75-35-4	0.07	5 U	1 U	1 U
cis-1,2-Dichloroethene	156-59-2	5	5 U	1 U	1 U
trans-1,2-Dichloroethene	156-60-5	5	5 U	1 U	1 U
1,2-Dichloropropane	78-87-5	1	5 U	1 U	1 U
cis-1,3-Dichloropropene	10061-01-5	0.4	5 U	1 U	1 U
trans-1,3-Dichloropropene	10061-02-6	0.4	5 U	1 U	1 U
2-Hexanone	591-78-6	50*	25 U	5 U	5 U
Methyl ethyl ketone (2-Butanone)	78-93-3	50*	25 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)	108-10-1	NE	25 U	5 U	5 U
Methylene chloride	75-09-2	5	5 U	1 U	1 U
Styrene	100-42-5	5	**320**	1 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	5	5 U	1 U	1 U
Tetrachloroethene (PCE)	127-18-4	5	5 U	**0.44 J**	1 U
1,1,1-Trichloroethane	71-55-6	5	5 U	1 U	1 U
1,1,2-Trichloroethane	79-00-5	1	5 U	1 U	1 U
Trichloroethene (TCE)	79-01-6	5	5 U	1 U	1 U
Vinyl chloride	75-01-4	2	5 U	1 U	1 U
Total VOCs		NE	**3590**	**0.44**	ND

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	MW-108	MW-109	MW-110
		Sample Name	DUP-BH01	MW-109S	MW-110S
		Start Depth	5	5	5
		End Depth	20	15	20
		Depth Unit	ft	ft	ft
		Sample Date	1/23/2013	1/23/2013	1/23/2013
		Parent Sample Code	MW-108S		
Analyte	CAS no.	NYS AWQS			
NYSDEC PAH17 (µg/L)					
Acenaphthene	83-32-9	20*	**65 J**	10 U	10 U
Acenaphthylene	208-96-8	NE	**80 J**	10 U	10 U
Anthracene	120-12-7	50*	110 U	10 U	10 U
Benzo(a)anthracene	56-55-3	0.002*	11 U	1 U	1 U
Benzo(b)fluoranthene	205-99-2	0.002*	11 U	1 U	1 U
Benzo(k)fluoranthene	207-08-9	0.002*	11 U	1 U	1 U
Benzo(g,h,i)perylene	191-24-2	NE	110 U	10 U	10 U
Benzo(a)pyrene	50-32-8	ND	11 U	1 U	1 U
Chrysene	218-01-9	0.002*	110 U	10 U	10 U
Dibenz(a,h)anthracene	53-70-3	NE	11 U	1 U	1 U
Fluoranthene	206-44-0	50*	110 U	10 U	10 U
Fluorene	86-73-7	50*	110 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.002*	11 U	1 U	1 U
2-Methylnaphthalene	91-57-6	NE	**250**	10 U	10 U
Naphthalene	91-20-3	10*	**1500**	10 U	10 U
Phenanthrene	85-01-8	50*	110 U	10 U	10 U
Pyrene	129-00-0	50*	110 U	10 U	10 U
Total PAHs		NE	**1895**	ND	ND
NYSDEC PAH17 Other SVOCs (µg/L)					
Bis(2-chloroethoxy)methane	111-91-1	5	110 U	10 U	10 U
Bis(2-chloroethyl)ether	111-44-4	1	11 U	1 U	1 U
Bis(chloroisopropyl)ether	108-60-1	5	110 U	10 U	10 U
Bis(2-ethylhexyl)phthalate	117-81-7	5	110 U	10 U	10 U
4-Bromophenyl phenyl ether	101-55-3	NE	110 U	10 U	10 U
Butyl benzyl phthalate	85-68-7	50*	110 U	10 U	10 U
Carbazole	86-74-8	NE	110 U	10 U	10 U
4-Chloro-3-methylphenol	59-50-7	NE	110 U	10 U	10 U
4-Chloroaniline	106-47-8	5	110 U	10 U	10 U
2-Chloronaphthalene	91-58-7	10*	110 U	10 U	10 U
2-Chlorophenol	95-57-8	NE	110 U	10 U	10 U
4-Chlorophenyl phenyl ether	7005-72-3	NE	110 U	10 U	10 U
Dibenzofuran	132-64-9	NE	110 U	10 U	10 U
1,2-Dichlorobenzene	95-50-1	3	110 U	10 U	10 U
1,3-Dichlorobenzene	541-73-1	3	110 U	10 U	10 U
1,4-Dichlorobenzene	106-46-7	3	110 U	10 U	10 U
3,3-Dichlorobenzidine	91-94-1	5	210 U	20 U	20 U
2,4-Dichlorophenol	120-83-2	5	110 U	10 U	10 U

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	MW-108	MW-109	MW-110
		Sample Name	DUP-BH01	MW-109S	MW-110S
		Start Depth	5	5	5
		End Depth	20	15	20
		Depth Unit	ft	ft	ft
		Sample Date	1/23/2013	1/23/2013	1/23/2013
		Parent Sample Code	MW-108S		
Analyte	CAS no.	NYS AWQS			
Diethyl phthalate	84-66-2	50*	110 U	10 U	10 U
Dimethyl phthalate	131-11-3	50*	110 U	10 U	10 U
2,4-Dimethylphenol	105-67-9	50*	110 U	10 U	10 U
Di-n-butyl phthalate	84-74-2	50	110 U	10 U	10 U
4,6-Dinitro-2-methylphenol	534-52-1	NE	320 U	31 U	30 U
2,4-Dinitrophenol	51-28-5	10*	320 U	31 U	30 U
2,4-Dinitrotoluene	121-14-2	5	21 U	2 U	2 U
2,6-Dinitrotoluene	606-20-2	5	21 U	2 U	2 U
Di-n-octyl phthalate	117-84-0	50*	110 U	10 U	10 U
Hexachlorobenzene	118-74-1	0.04	11 U	1 U	1 U
Hexachlorobutadiene	87-68-3	0.5	21 U	2 U	2 U
Hexachlorocyclopentadiene	77-47-4	5	110 U	10 U	10 U
Hexachloroethane	67-72-1	5	11 U	1 U	1 U
Isophorone	78-59-1	50*	110 U	10 U	10 U
2-Methylphenol (o-Cresol)	95-48-7	1	110 U	10 U	10 U
4-Methylphenol (p-Cresol)	106-44-5	1	110 U	10 U	10 U
2-Nitroaniline	88-74-4	5	210 U	20 U	20 U
3-Nitroaniline	99-09-2	5	210 U	20 U	20 U
4-Nitroaniline	100-01-6	5	210 U	20 U	20 U
Nitrobenzene	98-95-3	0.4	11 U	1 U	1 U
2-Nitrophenol	88-75-5	NE	110 U	10 U	10 U
4-Nitrophenol	100-02-7	NE	320 U	31 U	30 U
N-Nitrosodi-n-propylamine	621-64-7	NE	11 U	1 U	1 U
N-Nitrosodiphenylamine	86-30-6	50*	110 U	10 U	10 U
Pentachlorophenol	87-86-5	1	320 U	31 U	30 U
Phenol	108-95-2	1	110 U	10 U	10 U
1,2,4-Trichlorobenzene	120-82-1	5	11 U	1 U	1 U
2,4,5-Trichlorophenol	95-95-4	NE	110 U	10 U	10 U
2,4,6-Trichlorophenol	88-06-2	NE	110 U	10 U	10 U
Total SVOCs		NE	**1895**	ND	ND
Total Metals (ug/L)					
Aluminum	7429-90-5	NE	200 U	**105 J**	200 U
Antimony	7440-36-0	3	10 U	10 U	10 U
Arsenic	7440-38-2	25	5 U	5 U	**5.2**
Barium	7440-39-3	1000	**8.6 J**	**135 J**	**23.2 J**
Beryllium	7440-41-7	3*	2 U	2 U	2 U
Cadmium	7440-43-9	5	5 U	**1.8 J**	5 U
Calcium	7440-70-2	NE	**95700**	**207000**	**70500**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

		Location Name	MW-108	MW-109	MW-110
		Sample Name	DUP-BH01	MW-109S	MW-110S
		Start Depth	5	5	5
		End Depth	20	15	20
		Depth Unit	ft	ft	ft
		Sample Date	1/23/2013	1/23/2013	1/23/2013
		Parent Sample Code	MW-108S		
Analyte	CAS no.	NYS AWQS			
Chromium	7440-47-3	50	10 U	10 U	10 U
Cobalt	7440-48-4	NE	50 U	50 U	50 U
Copper	7440-50-8	200	25 U	25 U	25 U
Iron	7439-89-6	300	**6130**	**107 J**	**352**
Lead	7439-92-1	25	5 U	5 U	**4.2 J**
Magnesium	7439-95-4	35000*	**12500**	**107000**	**5210**
Manganese	7439-96-5	300	**214**	**67.8**	**14 J**
Mercury	7439-97-6	0.7	0.2 U	0.2 U	0.2 U
Nickel	7440-02-0	100	40 U	**6.5 J**	40 U
Potassium	7440-09-7	NE	**6600**	**23500**	**4230 J**
Selenium	7782-49-2	10	10 U	10 U	10 U
Silver	7440-22-4	50	10 U	10 U	10 U
Sodium	7440-23-5	20000	**97000**	**1140000**	**33600**
Thallium	7440-28-0	0.5*	10 U	10 U	10 U
Vanadium	7440-62-2	NE	50 U	50 U	50 U
Zinc	7440-66-6	2000*	30 U	**274**	30 U
Total Cyanide (μg/L)					
Total Cyanide	57-12-5	200	**550**	**160**	**590**

Table 3 - Analytical Groundwater Results
Belle Harbor Shopping Center
Rockaway Park, New York

Notes:

µg/L - micrograms per liter or parts per billion (ppb)
BTEX - benzene, toluene, ethylbenzene, and xylenes
VOCs - volatile organic compounds
PAHs - polycyclic aromatic hydrocarbons
SVOCs - semivolatile organic compounds

NYSDEC- New York State Department of Environmental Conservation

NYS AWQS - New York State Ambient Water Quality Standards and Guidance Values for GA groundwater
* indicates the value is a guidance value and not a standard

NE - not established

Bolding indicates a detected concentration
Gray shading indicates that the detected result value exceeds NYS AWQS

Validation performed by Stantec and provided to GEI for entry
Data Qualifiers:

J - estimated value
U - not detected to the reporting limit
UJ - not detected at or above the reporting limit shown and the reporting limit is estimated

Table 1. Groundwater Analysis Results
Belle Harbor Site
Rockaway Park, NY

Analyte	Units	CAS No.	NYS AWQS	MW-1
			Sample Name	MW-1
			Sample Date	11/11/2020
			Parent Sample	
BTEX	ug/L			
Benzene		71-43-2	1	**160**
Toluene		108-88-3	5	**1400**
Ethylbenzene		100-41-4	5	**1000**
o-Xylene		95-47-6	5	**430**
m/p-Xylene		179601-23-1	5	**590**
Total BTEX (ND=0)		TBTEX_ND0	NE	**3580**
Other VOCs	ug/L			
Acetone		67-64-1	50*	25 U
Bromochloromethane		74-97-5	5	5 U
Bromodichloromethane		75-27-4	50*	5 U
Bromoform		75-25-2	50*	5 U
Bromomethane		74-83-9	5	5 UJ
Carbon disulfide		75-15-0	60*	5 U
Carbon tetrachloride		56-23-5	5	5 U
Chlorobenzene		108-90-7	5	5 U
Chloroethane		75-00-3	5	5 U
Chloroform (Trichloromethane)		67-66-3	7	5 U
Chloromethane		74-87-3	5	5 U
Cyclohexane		110-82-7	NE	5 U
1,2-Dibromo-3-chloropropane		96-12-8	0.04	5 U
Dibromochloromethane		124-48-1	50*	5 U
1,2-Dibromoethane (EDB)		106-93-4	0.0006	5 U
1,2-Dichlorobenzene (o-DCB)		95-50-1	3	5 U
1,3-Dichlorobenzene (m-DCB)		541-73-1	3	5 U
1,4-Dichlorobenzene (p-DCB)		106-46-7	3	5 U
Dichlorodifluoromethane (Freon 12)		75-71-8	5	5 U
1,1-Dichloroethane		75-34-3	5	5 U
1,2-Dichloroethane		107-06-2	0.6	5 U
1,1-Dichloroethene		75-35-4	5	5 U
cis-1,2-Dichloroethene		156-59-2	5	5 U
trans-1,2-Dichloroethene		156-60-5	5	5 U
1,2-Dichloropropane		78-87-5	1	5 U
cis-1,3-Dichloropropene		10061-01-5	0.4	5 U
trans-1,3-Dichloropropene		10061-02-6	0.4	5 U
1,4-Dioxane		123-91-1	NE	250 U
2-Hexanone		591-78-6	50*	25 U
Isopropylbenzene		98-82-8	5	**47**
Methyl acetate		79-20-9	NE	25 U
Methyl ethyl ketone (2-Butanone)		78-93-3	50*	25 U
Methyl tert-butyl ether (MTBE)		1634-04-4	10*	5 U
4-Methyl-2-pentanone (MIBK)		108-10-1	NE	25 U
Methylcyclohexane		108-87-2	NE	5 U
Methylene chloride		75-09-2	5	5 U
Styrene		100-42-5	5	**430**
1,1,2,2-Tetrachloroethane		79-34-5	5	5 U
Tetrachloroethene (PCE)		127-18-4	5	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)		76-13-1	5	5 U
1,2,3-Trichlorobenzene		87-61-6	5	5 U
1,2,4-Trichlorobenzene		120-82-1	5	5 U
1,1,1-Trichloroethane (TCA)		71-55-6	5	5 U
1,1,2-Trichloroethane		79-00-5	1	5 U
Trichloroethene (TCE)		79-01-6	5	5 U
Trichlorofluoromethane (Freon 11)		75-69-4	5	5 U
Vinyl chloride		75-01-4	2	5 U
Total VOCs (ND=0)		TVOC_ND0	NE	**4057**
PAH17	ug/L			
Acenaphthene		83-32-9	20*	**140 J**
Acenaphthylene		208-96-8	NE	**97 J**
Anthracene		120-12-7	50*	200 U
Benzo(a)anthracene		56-55-3	0.002*	20 U
Benzo(b)fluoranthene		205-99-2	0.002*	40 U
Benzo(k)fluoranthene		207-08-9	0.002*	20 U
Benzo(g,h,i)perylene		191-24-2	NE	200 UJ
Benzo(a)pyrene		50-32-8	ND	20 U
Chrysene		218-01-9	0.002*	200 U
Dibenz(a,h)anthracene		53-70-3	NE	20 UJ
Fluoranthene		206-44-0	50*	200 U
Fluorene		86-73-7	50*	**80 J**
Indeno(1,2,3-cd)pyrene		193-39-5	0.002*	40 UJ
2-Methylnaphthalene		91-57-6	NE	**590**
Naphthalene		91-20-3	10*	**3600**

Table 1. Groundwater Analysis Results
Belle Harbor Site
Rockaway Park, NY

			Sample Name Sample Date Parent Sample	MW-1 11/11/2020
Analyte	**Units**	**CAS No.**	**NYS AWQS**	
Phenanthrene		85-01-8	50*	**73 J**
Pyrene		129-00-0	50*	200 U
Total PAH (17) (ND=0)		TPAH17_ND0	NE	**4580**
PAH17 Other SVOCs	ug/L			
Acetophenone		98-86-2	NE	200 U
Atrazine		1912-24-9	7.5	200 U
Benzaldehyde		100-52-7	NE	200 UJ
Biphenyl (1,1-Biphenyl)		92-52-4	5	**59 J**
Bis(2-chloroethoxy)methane		111-91-1	5	200 U
Bis(2-chloroethyl)ether		111-44-4	1	20 U
2,2-oxybis(1-Chloropropane)		108-60-1	5	200 U
Bis(2-ethylhexyl)phthalate		117-81-7	5	200 U
4-Bromophenyl phenyl ether		101-55-3	NE	200 U
Butyl benzyl phthalate		85-68-7	50*	200 U
Caprolactam		105-60-2	NE	200 U
Carbazole		86-74-8	NE	200 U
4-Chloro-3-methylphenol		59-50-7	NE	200 U
4-Chloroaniline		106-47-8	5	20 U
2-Chloronaphthalene		91-58-7	10*	200 U
2-Chlorophenol		95-57-8	NE	200 U
4-Chlorophenyl phenyl ether		7005-72-3	NE	200 U
Dibenzofuran		132-64-9	NE	200 U
3,3-Dichlorobenzidine		91-94-1	5	400 U
2,4-Dichlorophenol		120-83-2	5	200 U
Diethyl phthalate		84-66-2	50*	200 U
Dimethyl phthalate		131-11-3	50*	200 U
2,4-Dimethylphenol		105-67-9	50*	200 U
Di-n-butyl phthalate		84-74-2	50	200 U
4,6-Dinitro-2-methylphenol		534-52-1	NE	600 U
2,4-Dinitrophenol		51-28-5	10*	600 U
2,4-Dinitrotoluene		121-14-2	5	40 UJ
2,6-Dinitrotoluene		606-20-2	5	40 U
Di-n-octyl phthalate		117-84-0	50*	200 U
Hexachlorobenzene		118-74-1	0.04	20 U
1,3-Hexachlorobutadiene (C-46)		87-68-3	0.5	40 U
Hexachlorocyclopentadiene		77-47-4	5	200 U
Hexachloroethane		67-72-1	5	40 U
Isophorone		78-59-1	50*	200 U
2-Methylnaphthalene		91-57-6	NE	**590**
2-Methylphenol (o-Cresol)		95-48-7	1	200 U
4-Methylphenol (p-Cresol)		106-44-5	1	200 U
2-Nitroaniline		88-74-4	5	400 U
3-Nitroaniline		99-09-2	5	400 U
4-Nitroaniline		100-01-6	5	400 U
Nitrobenzene		98-95-3	0.4	20 U
2-Nitrophenol		88-75-5	NE	200 UJ
4-Nitrophenol		100-02-7	NE	600 UJ
N-Nitrosodiphenylamine (NDFA)		86-30-6	50*	200 U
N-Nitrosodi-n-propylamine (NDPA)		621-64-7	NE	20 U
Pentachlorophenol		87-86-5	1	600 UJ
Phenol		108-95-2	1	200 U
1,2,4,5-Tetrachlorobenzene		95-94-3	5	200 U
2,3,4,6-Tetrachlorophenol		58-90-2	NE	200 U
2,4,5-Trichlorophenol		95-95-4	NE	200 U
2,4,6-Trichlorophenol		88-06-2	NE	200 U
Total SVOCs (ND=0)		TSVOC_ND0	NE	**4639**
Cyanides	ug/L			
Free Cyanide		FREECN	NE	5 U
Total Cyanide		57-12-5	200	**483 J**

Notes:
Analytes in blue are not detected in any sample
ug/L = micrograms per liter or parts per billion (ppb)

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
PAH = Polycyclic Aromatic Hydrocarbon
SVOC = Semi-Volatile Organic Compound
VOC = Volatile Organic Compound

Total BTEX, Total VOCs, Total PAHs, and Total SVOCs are calculated using detects only.
Total PAH17 is calculated using the list of analytes: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenz[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-cd]pyrene, Naphthalene, 2-Methylnaphthalene, Phenanthrene, and Pyrene

NYS AWQS = New York State Ambient Water Quality Standards and Guidance Values for GA groundwater
* indicates the value is a guidance value and not a standard

CAS No. = Chemical Abstracts Service Number
MGP = Manufactured Gas Plant
ND = Not Detected
NE = Not Established

Bolding indicates a detected result concentration
Gray shading and bolding indicates that the detected result value exceeds the NYS AWQS

Data Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.
UJ = The results was not detected at or above the reporting limit shown and the reporting limit is estimated.

APPENDIX C

Resumes

Alexander DeNadai P.E., PMP, LEED® AP

Senior Engineering Project Manager

31 years of experience · West Chester, Pennsylvania

Alex has more than 23 years of professional engineering, project management, and field operations experience and more than 16 years of project management experience for groundwater remediation O&M, landfill O&M, construction remediation, and water/wastewater treatment facility design and environmental services projects. He has managed over $30 million in project gross revenue, and has served as a leader and instructor for his company's internal project management development program. Alex is currently the Engineering Group Resource Leader for his Business Center, and has served in a similar staff-management capacity for previous employers.

EDUCATION

M.S., Sustainable Design, Philadelphia University, Pennsylvania, 2012

M.B.A, Business Administration, West Chester University, Pennsylvania, 2001

B.S., Chemical Engineering with Italian Minor, University of New Hampshire, New Hampshire, 1992

REGISTRATIONS

Professional Engineer #20160, State of Delaware, first issued 2015

Professional Engineer #24GE05272400,, State of New Jersey, first issued 2016

Professional Engineer #PE040527, State of Georgia, first issued 2015

Professional Engineer #10645, Washington, D.C. (District of Columbia), 1997

Professional Engineer #085798, State of New York, 2008

Professional Engineer #35360, State of Maryland, 2007

Professional Engineer #PE070595, Pennsylvania Department of State, 2003

MEMBERSHIPS

Member, Delaware Valley Green Building Council

PROJECT EXPERIENCE

ENVIRONMENTAL ENGINEERING

Landfill O&M* | Pennsylvania | Project Manager and Lead Project Engineer

Provided O&M for two landfill treatment facilities that implement air stripping, bioreaction, media filtration, and ion exchange technologies. Duties included engineering, scheduling, contracting, staff coordination, reporting, and other administrative functions. Implemented proprietary collaborative project website (TeamLinksm), and directed development of proprietary electronic tools for optimizing data collection and management. Instrumental in identifying and implementing improvements to the treatment systems, including optimization of existing water storage capacity, development and implementation of chemical treatment program to address iron fouling issues, and development and implementation of mechanical modifications to maximize treatment flow rates. As Project Manager, responsible for preparing proposals for contract extensions, which were repeatedly awarded in a non-competitive process. Both projects have significantly exceeded planned profitability goals in each contract period, and client satisfaction consistently remained at a high level.

Spill Prevention* | Department of Aviation | Pennsylvania | Lead Project Engineer

Prepared Spill Prevention, Control, and Countermeasures (SPCC) Plan for the Philadelphia International Airport. Plan included preventive and response actions for management of petroleum-based spills in accordance with 40 CFR 112.

Remediation Oversight, Multiple Sites* | Pennsylvania/Kentucky/West Virginia/Illinois | Site Manager and Engineer

Projects involved remediation of soil, sediment, water, drain lines, and equipment for the presence of PCBs and petroleum-based constituents at multiple industrial (natural gas pipeline) facilities. Site manager/engineer for six sites responsible for direction of sampling and excavation, preparation of HASPs, work plans, and final reports. Responsible for field staff management, reporting, and direct contact with client, state, and federal agencies.

** denotes projects completed with other firms*

Human Health Risk Assessment* | New York City Department of Environmental Protection (NYCDEP) | New York | Assistant Project Manager

Conducted extensive health risk assessment of working conditions at a principal NYCDEP water distribution facility located on the Kensico Reservoir. Duties included direction and control of all project tasks, including a survey of site employees, development of a characterization work plan, field sampling activities, and development of a health risk assessment report. Tracked project costs, approved invoices, assisted in client billing, and coordinated subcontractors. Acted as site manager for 3-week sampling effort, was primary author for the work plan, and orchestrated the health risk assessment efforts toward the final report.

Soil Vapor Extraction/Air Sparging* | Geon | Kentucky | Lead Project Engineer

Project involved review of existing data on a massive VOC plume located beneath a plastics manufacturing facility. Performed oversight and geochemical logging for soil boring investigation and subsequent installation of over 50 SVE/AS wells. Designed and elicited bids for necessary vacuum blower equipment, off-gas treatment equipment (thermal oxidizer), and all interconnecting vapor and condensate piping. Prepared air permit for discharge of treated air stream.

Site Assessments* | Ohio | Site Reviewer

Performed site assessment at four inactive natural gas compressor stations to determine areas potentially impacted from station operations. Interacted directly with client site contact to develop locations requiring sampling and further investigation. Generated characterization sampling plan for each site based on site review, and developed remediation work plans based on characterization field efforts.

Soil Washing Technology* | BioGenesis | New Jersey | Lead Project Engineer and Assistant Project Manager

Project involved use of soil washing technology to treat chemically-hazardous sediments dredged from the New York/New Jersey Harbor. Prepared Work Plan and HASP to construct, operate, and demobilize soil washing facility and equipment at the New Jersey harbor location. Served as plant operator for a 3-month pilot study, and project engineer/assistant project manager for design and build of a permanent sediment washing facility in New Jersey.

Landfill Gas and Leachate Collection and Treatment* | Pennsylvania Department of Environmental Protection | Strasburg Landfill Site, Pennsylvania | Project Manager and Lead Project Engineer

The project involved O&M for a 50-acre closed landfill site and associated treatment facility for the landfill gas and leachate. Off-gas treatment consisted of thermal destruction via a flare system, and leachate treatment included filtration of metals via pH adjustment, polymer addition, and mechanical separation, followed by air stripping of volatile organic compounds (VOCs). Contract responsibilities included system O&M, maintenance of the landfill cap and property, and routine monitoring, including sampling of nearby property owners' water supply. Duties as Project Manager and Lead Engineer included engineering, scheduling, contracting, staff coordination, reporting, and other administrative functions. Instrumental in preparing and negotiating annual contract extensions for company's continued performance on this project.

Hazardous Waste Reporting* | Lead Project Engineer | Pennsylvania and South Carolina | Project Engineer

Evaluated hazardous waste information generated by facility personnel of electronics manufacturing facilities. Prepared Superfund Amendments and Reauthorization Act (SARA) Tier II reports (emergency and hazardous chemical inventory) and Resource Conservation and Recovery Act (RCRA) biennial hazardous waste generation and disposal reports, and filed to respective local, state, and federal agencies.

Infrastructure Remediation* | ECCO III Enterprises, Inc | New York | Project Manager

Project involved decontamination of concrete surfaces of the Kensico Dam, NY for the presence of lead, mercury, and polychlorinated biphenyls (PCBs); and the removal of impacted sediments from the Kensico Dam's discharge area. Our team was responsible for performing remedial cleaning with high-pressure water and various surfactants, including the use of a proprietary agent for mercury remediation. Upon remedial cleaning of the infrastructure surfaces, our team performed confirmation sampling to determine if additional cleaning is necessary to achieve the applicable action levels. Our team was responsible for preparing all design documents and specifications, and for overseeing the sediment removal portion of this project. Other activities performed by our team in support of this project included the preparation of health and safety plans (HASPs), work plans, and summary reports; coordination with the applicable clients and governing agencies; health & safety training for client personnel; and other services. As Project Manager, my duties included daily coordination with field (including Union) and office project personnel, technical review of submittals, interfacing with client personnel, development and maintenance of project SharePoint site, control of project financials, and other significant participation in our company's award of this $5 million-plus contract.

** denotes projects completed with other firms*

Soil Vapor Extraction/Air Sparging* | PolyOne | Australia | Project Manager

Furnished catalytic oxidizer (manufactured by others) for SVE/AS system located at an active plastics manufacturing facility. System entailed use of ten air sparging and twelve vacuum extraction wells for management of a chlorinated solvent groundwater plume present in the local deep and shallow aquifers. As Project Manager and Lead Project Engineer, responsible for consulting and engineering services in support of the routine operation and enhancement of the respective remediation system.

Soil Vapor Extraction* | Ketchem & McDougal | New Jersey | Assistant Engineer

Assisted in construction of SVE system to treat trichloroethylene (TCE)-impacted groundwater plume beneath an active printing facility. Tasks included design and build of vacuum blower system, granular-activated carbon (GAC) units, and related piping for effective removal of contaminants. Performed weekly air monitoring and sampling to maintain efficiency of system.

Wetlands Restoration* | New Jersey | Construction Oversight Representative

Performed oversight for construction of berms, high marsh areas, and drainage channels for restoration of South Jersey wetlands. Reported directly to client with contractor's progress and daily activities. Conducted compaction tests and other site inspections to verify that construction was being performed according to specifications.

Groundwater Remediation Assessment and Treatment System Operations and Maintenance (O&M), Berks Sand Pit Site* | Pennsylvania Department of Environmental Protection (PADEP) | Pennsylvania | Project Manager and Lead Project Engineer

The initial scope of this former Superfund Site project was to provide O&M for a groundwater collection and treatment system, which consists of batch equalization, suspended solids removal, and air stripping of VOCs. However, the project evolved to implementing several supplemental remedial activities to aggressively reduce the contaminant plume and overall lifecycle duration for the active treatment program, including a geophysical survey to identify potential water-producing fractures, installation of an additional groundwater recovery well, performance of pump tests, and connection of this additional recovery well to the existing treatment system. The project team also conducted a successful pilot study of in situ bioremediation/in situ chemical reduction technology to augment the overall site remediation program and advance the site closure. Duties as the Project Manager/Lead Engineer included engineering, scheduling, contracting, staff coordination, reporting, and other administrative and technical functions.

Groundwater Extraction and Treatment* | U.S. Army Corps of Engineers (USACE) | Aberdeen Proving Ground, Maryland | Plant Operator

Full-time Plant Operator for 35K gpd treatment facility that collected groundwater in the vicinity of former military waste landfill; treated it via chemical reaction, adsorption, filtering, and ultraviolet (UV) treatment; and disposed of it in a nearby surface stream. Performed routine maintenance, monitoring, sampling, and agency reporting activities for effective operation and compliance with state and federal regulations.

Groundwater Extraction and Treatment* | U.S. Army Corps of Engineers | North Carolina | Project Engineer

Reviewed current operating procedures for existing groundwater extraction and treatment system, and investigated multiple options to resolve problems caused by high metals concentrations in the groundwater. Alternatives investigated included flocculation with sand filtration, enhanced dissolution, bag filtration, and discharge to a POTW for treatment.

Bioremediation* | Pennsylvania | Assistant Project Manager

Investigated bioremediation alternatives to expedite remediation of VOC-contaminated groundwater at a former plastics manufacturing facility. Performed industry research of previous case studies and available bioremediation technologies. Involved with preparation of final report outlining the feasible options and respective costs.

Landfill Construction* | Northeast Philadelphia Airport | Pennsylvania | Project Engineer

Prepared Pollution Prevention and Control (PPC) Plan for construction and operation of the Red Lion Road Landfill located at the Northeast Philadelphia Airport.

Soil Vapor Extraction/Air Sparge System Start-Up Support and O&M, Bishop Tube Site* | Pennsylvania Department of Environmental Protection (PADEP | Pennsylvania | Project Manager and Lead Project Engineer

This project involved engineering and operations support for the Bishop Tube site soil remediation program, which consisted of VOC treatment at three plume areas via soil vapor extraction (SVE) and air sparge (AS) technology. The treatment system, which consisted of approximately 35 horizontal SVE wells, 32 vertical SVE wells, 28 AS wells, and off-gas destruction via a catalytic oxidizer, was installed by our project team. Responsibilities as the Project Manager/Lead Engineer included technical review and comment on all operational related issues; regular interaction with the project team, property owner, and client to maintain clear forward progress on the project; and engineering evaluations and recommendations for enhancing the overall remedial program.

** denotes projects completed with other firms*

Reservoir Facility Rehabilitation* | New York City Department of Environmental Protection (NYCDEP) | New York | Project Manager

Project involved decontamination, removal, and disposal of public water distribution equipment for the public water supplier of New York City. Former equipment contained mercury, arsenic, lead, and other constituents at levels warranting replacement. Our team's involvement included dismantling, characterizing, and properly disposing of water management infrastructure, as well as health and safety oversight for general contractor providing other site remediation services. This over-10-year project was very challenging due to interaction with other subcontractors, difficult technical approach, and involvement with labor unions. Duties included wide range of invoicing, staffing, scheduling, bidding, and communication with client, contractors, unions, and regulatory agencies.v

Soil Remediation* | Southeastern Pennsylvania Transportation Authority (SEPTA) | Pennsylvania | Project Manager and Lead Project Engineer

Performed site characterization and subsequent oversight for excavation and disposal of PCB-impacted soils at rail car maintenance shop. Objective of project was to close site under PADEP Act II requirements, and contract responsibilities included agency interface and development of associated work plans, health and safety plans, and closure reports. Worked closely with client through process of procuring the remediation contractors, and coordinating with several divisions of client organization to develop acceptable terms and schedule for execution of the work. Assessed and prepared geotechnical remedial strategy for addressing impacted soils located on steep slope braced by a compromised support wall. Duties included preparation and review of plans and documents, engineering, scheduling, contracting, staff coordination, reporting, and on-site management and execution of field activities.

Groundwater Extraction and Treatment* | Pennsylvania | Project Manager

Provided project management and engineering for six pump-and-treat (P&T) groundwater remediation systems at plastics manufacturing facilities across Pennsylvania. Facilities were not manned full-time, and emergency response visits were made based on signals from remote monitoring systems. Responsibilities include scheduling and direction of all field activities, coordination of contractors, review and interpretation of all site data, maintaining optimal performance of each system, preparation of O&M reports, approval of invoices, tracking of budgets, and direct reporting to the client. Gained working experience with data telemonitoring systems, which were in place at four of the treatment systems.

Remedial Investigation/Feasibility Study (RI/FS),* | USACE-Baltimore District (CENAB) | Maryland | Lead Project Engineer

Work involved ongoing site investigations (SIs) to address VOC-contaminated groundwater at a former missile defense site. Complex and time-sensitive project due to adjacent property owner's desires to develop the nearby lots. Prepared work plan to collect additional data for development of a groundwater plume model. Investigated bioremediation and other remedial alternatives to address the issue in a timely manner to accommodate all project stakeholders.

Spill Investigation and Response, Newport Road Site* | Pennsylvania | Project Manager

Our firm was contracted by the Pennsylvania Department of Environmental Protection (PADEP) to investigate the report of a chemical release on a residential property in Lancaster County, PA. The reported evidence included the visual presence of a sheen in a nearby, unnamed stream tributary, as well as noxious odors in the basement of the suspect property. In response, our company conducted interviews with parties of interest, collected surface water and soil boring (via GeoProbe) samples, and performed a GPR assessment and video survey of the subsurface stormwater/site drainage conveyance piping in the area. Although the root cause of the release could not be confirmed with 100% certainty, it was concluded that the source was an overfilling of the subject property's heating oil tank. As Project Manager, duties included the direction of all project staff and subcontractors, preparation/review of all work plans and investigation summary reports, consultation with the client and parties of interest, and all project financial management and controls.

Alternative Drinking Water Supply Assessment/Design and Point of Entry Treatment (POET) System Operations and Maintenance (O&M), Baghurst Alley Site* | Pennsylvania | Project Manager

The principal scope of this assignment was to provide an interim supply of safe drinking water (via bottled water delivery) and O&M services for sixteen (16) residential POET systems, necessary as a result of improper disposal of chlorinated solvents on a nearby property. Concurrent with the aforementioned activities, our team conducted a hydrogeological investigation and prepared an associated design and report for the installation of a new common well, and associated delivery piping, to provide a safe drinking water supply to the residents of Baghurst Alley. As Project Manager, duties included participation and review in the design process, management/coordination for bottled water delivery and POET system O&M, and communications with all stakeholders involved.

** denotes projects completed with other firms*

Landfill Gas Collection and Monitoring, GSK Lower Merion R&D Facility* | Pennsylvania | Project Manager

Our client, GlaxoSmithKline (GSK), developed a research and development facility adjacent to a closed municipal landfill in Lower Merion, PA. As part of the development process, a landfill gas (LFG) collection and monitoring system was installed on the property perimeter between the landfill and GSK-developed areas. The collection system encompassed 51 perimeter gas wells interconnected with subgrade HDPE piping. A central blower system was used to transfer and exhaust the LFG to atmosphere in a distant location from the inhabited areas of the site (no treatment necessary due to the quality of the effluent gas). A series of seven (7) gas monitoring wells were also positioned around the nearest occupied building to the landfill, and outfitted with a sensing, alarming, and ventilation system in the event the LFG health threshold concentrations were exceeded. Our contract entailed routine (quarterly) gas well sampling, inspection, servicing, and reporting for this site. As Project Manager, responsible for scheduling/managing the project teams, reviewing the quarterly reports, and identifying/implementing system enhancement measures as needed. Successful in obtaining multiple annual contract renewals as schedule, quality, and budget metrics were consistently upheld.

Groundwater Treatment System O&M, Heleva and Eastern Diversified Metals Landfill Sites* | Pennsylvania | Project Manager and Lead Project Engineer

Provided O&M for two landfill treatment facilities that implement air stripping, bioreaction, media filtration, and ion exchange technologies. Duties included engineering, scheduling, contracting, staff coordination, reporting, and other administrative functions. Implemented proprietary collaborative project website (TeamLinksm), and directed development of proprietary electronic tools for optimizing data collection and management. Instrumental in identifying and implementing improvements to the treatment systems, including optimization of existing water storage capacity, development and implementation of chemical treatment program to address iron fouling issues, and development and implementation of mechanical modifications to maximize treatment flow rates. As Project Manager, responsible for preparing proposals for contract extensions, which were repeatedly awarded in a non-competitive process. Both projects have significantly exceeded planned profitability goals in each contract period, and client satisfaction consistently remained at a high level.

In Situ Chemical Oxidation (ISCO) Groundwater Remediation, Topton Site* | Pennsylvania | Project Manager

An historical release of chlorinated solvent waste by an industrial manufacturing facility in Topton, PA caused a groundwater contamination plume which affected downgradient homeowners nearly a mile away. These affected residences were provided point-of-entry (POET) treatment systems for their private water supply wells, and our firm was tasked with conducting a remedial alternatives analysis to identify feasible technologies to address the gross volumes of contaminants residing in the groundwater and karst bedrock formation beneath the site. The analysis identified ISCO technology as the most promising from a site suitability perspective, treatment effectiveness, and relative cost perspective. Subsequently, our firm was tasked to prepare a design and work plan for constructing and operating a sodium permanganate injection system to address the groundwater contamination. To best manage costs, the design accounted for the use of the existing well system as much as practical for chemical delivery system, and employed a low-flow feed to maximize the impact of the injectate. As Project Manager, I participated in developing the technological approach, writing and reviewing the plans and reports, leading the team through the work process, communicating with the client and other stakeholders, and managing the project financials and schedule.

Vapor Intrusion (VI) Evaluation, Former Algonquin Chemical Company Site* | Pennsylvania | Project Manager

Over its history, the Former Algonquin Chemical Company site in Hamburg, PA, was found to contain concentrations of chlorinated solvents in the underlying groundwater in exceedance of the respective water quality standards. Due to the relatively low concentrations and low risk to receptors, environmental closure for the site was pursued, but the vapor intrusion pathway was determined to be potentially complete. Industrial operations (wood palette manufacturing) were still active at the site, and our firm was tasked with conducting a vapor intrusion evaluation for their primary operations building. The sampling program consisted of the installation of several sub-slab soil gas sampling ports, and samples were collected via 8-hour time delay summa canisters. At the completion of the sampling program, a summary report was prepared and submitted to the client that deemed the VI pathway to be below the applicable risk standards (a.k.a, incomplete) based on the results. Subsequently, a recommendation of “No Further Action” was proposed. As Project Manager, I was responsible for establishing, leading, and reviewing the sampling and reporting tasks, communicating with the client and other stakeholders, and managing the project financials and schedule.

** denotes projects completed with other firms*

Groundwater Contamination Source Investigation and Point of Entry Treatment (POET) System Operations and Maintenance (O&M), Clements Landfill Site* | Pennsylvania | Project Manager and Lead Engineer

The Clements Landfill Site, located in Berks County, PA, formerly accepted illegal disposal of hazardous wastes at its facility, which resulted in localized soil and groundwater contamination by heavy metals and chlorinated VOCs. As part of this investigation, our firm was tasked to perform a comprehensive soil, soil gas, and groundwater investigation at the site to determine the extent of environmental and health impacts to nearly twenty (2) downgradient residential properties. The findings of the investigation resulted in the installation and O&M of seven (7) point-of-entry (POET) systems: five (5) systems for VOC removal, and two (2) systems for metals removal. The scope of the project activities consisted of the annual sitewide groundwater sampling, semi-annual performance monitoring sampling of the POET systems, and routine O&M for these systems. As part of our services we assisted our client (PADEP) with the preparation of an Environmental Covenant to transfer operation responsibility of these POET systems to each of the residential owners, thus limiting PADEP's financial obligations for this project. As Project Manager, duties included the direction of all project staff and subcontractors, preparation/ review of all work plans and investigation summary reports, consultation with the client and impacted residents, and all project financial management and controls.

Soil Remediation, SEPTA Wayne Junction Rail Yard* | Pennsylvania | Project Manager and Lead Project Engineer

Performed site characterization and subsequent oversight for excavation and disposal of PCB-impacted soils at the SEPTA Wayne Junction rail car maintenance shop. Objective of project was to close site under PADEP Act II requirements, and contract responsibilities included agency interface and development of associated work plans, health and safety plans, and closure reports. Worked closely with client through process of procuring the remediation contractors, and coordinating with several divisions of client organization to develop acceptable terms and schedule for execution of the work. Assessed and prepared geotechnical remedial strategy for addressing impacted soils located on steep slope braced by a compromised support wall. Duties included preparation and review of plans and documents, engineering, scheduling, contracting, staff coordination, reporting, and on-site management and execution of field activities.

Chemical Bulk Storage Tank Inspection, Watervliet Arsenal* | New York (| Project Manager and Project Engineer

Pursuant to §598.1(k)(1) of the New York State Department of Environmental Conservation's Chemical Bulk Storage Regulations, our firm was retained to perform annual inspections for three (3) chemical bulk storage tanks located at the Watervliet Arsenal in Watervliet, NY. The inspection process involved a thorough visual and operational assessment of each tank, documentation on a 9-page checklist, and preparation of a Spill Prevention Report (SPR). As Project Manager and Project Engineer, responsible for conducting the site assessment, review of the draft SPR (prepared by other team members), and stamping as a licensed Professional Engineer in the State of New York. I have performed this assignment for three consecutive years dating back to 2013, and as Project Manager, successful in ensuring all quality, budget, and schedule requirements were met or exceeded during each annual event.

In-Situ Stabilization Remedial Design for Former Manufactured Gas Plant Site | New Jersey | Senior Project Engineer

Stantec holds a Master Services Agreement (MSA) with a large public utility that services southern New Jersey, and as part of this agreement has performed multi-million dollar projects for remedial assessments, designs, and implementation at multiple sites. For one former manufactured gas plant (MGP) site, the area of impact extended over multiple acres across a busy four-way intersection, which included an extensive network of subsurface utilities. The work zone also contained several structures slated for demolition that contained asbestos, lead-based paint, and universal waste. The total depth of excavation reached up to 30 feet below grade surface in some locations, which required the design of sheet piling for structural support. The remedy for this site included a combination of in-situ stabilization (ISS) for the saturated zone and conventional excavation and offsite transportation and disposal for the unsaturated zone. To accommodate the routine traffic patterns through the area of the site, and to maintain active utility status throughout the duration of the project, the construction was planned for four separate phases. As Senior Project Engineer, led the remedial design efforts inclusive of preparing the drawings and specifications, remedial action work plan (RAWP), ISS mix design report, and associated documents for the comprehensive bid-for-construction publication.

** denotes projects completed with other firms*

Site Characterization and Remedial Design Response to Transformer Fluid Release | Pennsylvania | Project Manager and Lead Engineer

A substation of a large public utility that services eastern and central Pennsylvania experienced a catastrophic failure of a transformer, releasing approximately 10,000 gallons of transformer fluid (mineral oil) to the environment. Due to the extreme precipitation conditions that were occurring at the time of the failure, the transformer fluids escaped the site and were observed in stream banks and waterways miles downgradient from the release area. Stantec was initially retained through a Disadvantaged Business Entity (DBE) to provide emergency response water treatment and site characterization services. The project evolved to include design, procurement support, and construction monitoring of a stormwater collection and treatment system (SCTS) to address the continual discharge of transformer fluid from the property. Work included the installation and sampling of multiple monitoring wells, monitoring of local private water supply wells, performance of several Interim Remedial Measures (IRMs) to address impacted soils and vegetation, and regulatory compliance activities. Upon successful start-up and operation of the SCTS, Stantec was tasked to provide operations and maintenance (O&M) support, preparation of an O&M Manual, training for the owner's staff, and development of a Site Characterization Report. As the Project Manager and Lead Engineer, Mr. DeNadai was responsible for development, leading and performance of the design preparation efforts, and client/team management to achieve a gross Stantec revenue exceeding $1 million and a Master Services Agreement (MSA).

WASTEWATER

Design for Wastewater Treatment System Improvements,* | Multiple Locations | Project Manager

This multi-national beverage manufacturer retained our company to prepare designs and associated construction bid documentation for improvements to their wastewater treatment operations at several of their bottling facilities located in the U.S. These designs predominantly consisted of segregation, piping, storage, and pH adjustment elements to improve the operability and reduce costs for their existing systems and processes. Specifically, evaluating each of the process waste streams (e.g., flavored wastewater, RO reject water, cooling tower blowdown, filling losses, etc.), segregating these streams for optimal disposition as appropriate, and designing for the associated system modifications to properly collect, treat onsite, and discharge; use for onsite irrigation; and/or collect and transport offsite for proper disposal. As Project Manager, responsible for preparing the technical and cost proposals for each assignment, leading the project team through the design and construction bid preparation phases, leading weekly teleconferences with the expanded client team, and ensuring adherence to project schedule, budget, and quality objectives.

Public Water* | American Water Works Association Research Foundation (AWWARF) | Multiple States | Project Manager and Lead Project Engineer

Performed field study and research of current water main flushing practices by public utilities across North America and abroad. Responsible for preparing a computer-based model that provides flushing cost and benefit information based on data inputs from the utility. Resultant study and conclusions prepared for publication by AWWARF (2004). Presented project progress at the 2001 AWWA Conference in Washington, DC.

Industrial Wastewater Treatment Design and Construction* | The Haskell Company | Pennsylvania | Project Manager

This project involved design and construction support services for a pH neutralization system for a newly constructed bottled water manufacturing (filling) facility. The treatment system consisted of a multi-tank equalization process, with acid/caustic injection, mixing, and pumping capabilities to ensure that all associated aqueous waste achieved the required National Pollutant Discharge Elimination System (NPDES) permit criteria prior to discharge to the publicly owned treatment works (POTW). The scope of the contract included the preparation of 30%, 90%, and Issued for Construction drawing packages, specifications, and equipment lists. Our company also provided procurement and field support services during construction of this system by others. Our team was instrumental in maintaining a tight project schedule, and was successful in acquiring several change orders to this contract based on our high-quality, technically-advanced performance. As the Project Manager, my responsibilities included interfacing with design personnel to ensure high quality, on-time deliverables; technical engineering reviews of drawings and documents; leadership for finalizing and issuing major deliverables; and management of project financials, including invoicing, budget tracking, and preparation of estimates to complete (ETCs).

Wastewater Management and Sustainability Evaluation* | Multiple Locations | Project Manager

Our team was tasked under this fast-track project to evaluate the current water and wastewater management practices for 16 drinking water bottling facilities for the purpose of optimizing these operations and establishing sustainable practices, such as irrigation, constructed wetlands development, and wastewater source reduction. The project consisted of a comprehensive evaluation of applicable wastewater treatment technologies, as well as a site-specific cost/benefit and feasibility assessment to identify the most viable water management opportunities for each facility. The final report highlighted the top 10 opportunities, based on feasibility and net present values, for the client to pursue. Duties as Project Manager included direction and management of project team, maintaining budget, controlling schedule, and being integrally involved on a technical basis during the evaluation process and report preparation activities.

** denotes projects completed with other firms*

Design and Construction Services for Replacement of Sludge Thickening System* | Delaware Regional Water Quality Authority (DELCORA) | Pennsylvania | Project Manager

The DELCORA Western Regional Treatment Plant (WRTP) formerly used dissolved air flotation (DAF) technology to thicken waste activated sludge (WAS) prior to dewatering and incineration. Due to the age and low reliability of the existing equipment, our company was tasked to evaluate several alternative technologies for sludge thickening, and made a recommendation to pursue a gravity belt thickener (GBT) system. Our company subsequently performed design- and construction-phase services in support of this project, which included three (3) new GBT systems, a WAS influent mixing and pumping tank, and polymer storage tank and injection system. Particular challenges of this assignment included the design for specific sequencing of the work, properly-rated equipment/instrumentation for the environment, ventilation, and area segregation methods during construction to ensure that the applicable NFPA hazard classification requirements. The design also accounted for the location of some equipment within the sub-grade DAF tanks, and the placement of the GBTs on a structurally-supported FRP grate above the tanks due to space restrictions within the facility. The design encompassed the civil, mechanical, structural, electrical, instrumentation, controls, and SCADA engineering disciplines, and culminated in the preparation of a comprehensive bid package of drawings and specifications. Duties as the Project Manager included development of the technical and cost proposal, coordination and direction of all engineering and design work, procurement and scheduling of all subcontractors.

Design and Construction-Phase Support Services for Decommissioning and Demolition of the Baldwin Run Pollution Control Facility (BRPCF)* | Delaware Regional Water Quality Authority (DELCORA), | Pennsylvania | Project Manager

The Southwest Delaware County Municipal Authority (SWDCMA) owned and operated a 6.0 MGD wastewater treatment facility known as the Baldwin Run Pollution Control Facility (BRPCF) located in Aston, PA. A decision was made to phase out the treatment facility and send all wastewater flow to the Delaware County Regional Water Quality Control Authority (DELCORA) wastewater treatment plant located in Chester, PA. Pursuant to these decisions and actions, our company was retained by DELCORA to prepare the necessary design and specification documentation for the proper decommissioning and demolition of the BRPCF, and to provide construction-phase services in support of the construction and field-related aspects of this project. One of the more challenging elements of this assignment was the development of a decommissioning and demolition plan, which provided a detailed analysis of the specific actions that needed to be taken, when each action needed to be taken, and in what sequence. The decommissioning and demolition phases were each completed as two distinct projects, with our company serving as the prime contractor for the decommissioning phase. As Project Manager, I ensured that progress was consistently maintained in accordance with the strict schedule by DELCORA and SWDCMA. Other responsibilities included development of the technical and cost proposal, coordination and direction of all engineering and design work, procurement and scheduling of all subcontractors, leading communications with the client and stakeholders, and overall management of the project financials.

** denotes projects completed with other firms*

Design and Construction Support Services for Industrial Wastewater Treatment System* | GlaxoSmithKline | Pennsylvania | Project Manager

GlaxoSmithKline (GSK) owns and operates a 0.36 MGD Industrial Wastewater Treatment Plant (IWTP) located at their processing facility in Marietta, PA. Over the years, our company has been tasked with a variety of engineering-, design-, and construction-related tasks for the evaluation and optimization of their wastewater treatment operations. As Project Manager, I led the preparation of a feasibility and cost-benefit assessment of the IWTP to identify and evaluate several system modifications to reduce operational costs and environmental liability for GSK. This assessment resulted in a project to replace the existing, under-utilized ozone disinfection system with a UV system, and our company was tasked to prepare the design and associated construction bid documentation for this project. Our company also completed an assessment of the facility's respective organic and inorganic waste streams to identify opportunities to appropriate select streams for IWTP treatment or direct discharge to the outfall location (surface stream) to reduce unnecessary treatment, while maintaining NPDES permit compliance and minimizing environmental risk. As Project Manager, I was responsible for preparing technical and cost proposals in support of these projects, leading the project teams through the engineering and design phases of the projects, serving as the primary point of contact for all communications, and providing engineering and technical support. Project budgets, schedule, and quality were upheld under all assignments that I was involved with for this client.

Rose Valley Wastewater Treatment Plant Process Modifications* | Delaware Regional Water Quality Authority (DELCORA) | Pennsylvania | Project Manager

Our company completed an evaluation which recommended that the 0.13 MGD Rose Valley Sewage Treatment Plant (RVSTP) be abandoned and that the associated treatment streams be directed to the Delaware Regional Water Quality Authority (DELCORA) Western Regional Treatment Plant (WRTP) in Chester, PA. Our company was subsequently retained to prepare design and construction bid documents to satisfy this recommendation, which entailed the installation of approximately 3 miles of new 6-inch HDPE force main between the existing pump station and new interceptor discharge point via HDD and open cut methods, and the installation of approximately 1-mile of 2-inch HDPE force main via slip lining of the former 6-inch ductile iron force main. The design also encompassed the replacement of the existing pump station centrifugal pumps, installation of a new packaged pump station to transfer a portion of the sewage to the pump station, and a new back-up diesel-powered generator. The project entailed the procurement, management, and direction of multiple subcontractors to complete the site topographical survey, flood plain delineation, geotechnical drilling analysis, utility location (via vacuum dig and GPR methods), traffic control, and ROW assessment. Duties as the Project Manager included development of the technical and cost proposal, coordination and direction of all engineering and design work, procurement and scheduling of all subcontractors, leading communications with the client and stakeholders, and overall management of the project financials.

Design, Construction, and Consulting Support Services for Wastewater Infrastructure Improvements* | City of Reading | Pennsylvania | Project Manager

Our company's primary responsibilities for this assignment included pre-design (permitting) and design support, environmental consulting, and full time, onsite construction management services for the City's installation of a new, nearly 2-mile-long, 42-inch ductile iron force main pipe to convey wastewater from its primary pump station to its 15 MGD wastewater treatment facility. The construction faced multiple design and construction challenges including a microtunneling installation of new force main beneath the Schuylkill River, soil and groundwater contamination in and around the deep excavations, line stop/wet tap/bypass of existing sections of force main in order to ensure uninterrupted wastewater flow, and structural challenges with a 16-ft high flood wall. Overall, sixteen separate task orders were executed for our company under the contract totaling over $1.8 million in gross revenue. My role was the Project Manager and principal environmental consultant leading our company's team through several pre-design activities (permit obtainment), multiple design alternatives and cost evaluations, collecting geotechnical and environmental site information in support of the design, and providing onsite and office support during the approximate 3-year construction duration of the project (as the project was divided into two design-bid-build phases). As Project Manager, successful in ensuring all design and construction tasks were completed on schedule, on budget, and to a high level of quality to meet or exceed the City of Reading's and regulatory agencies' expectations.

LEED® Certification for Commercial Office Space, Weston Solutions Building 5* | Pennsylvania | Project Administrator

While employed at Weston Solutions, Inc., a committee [Sustainability Action Team (SAT)] was formed to promote sustainability education, practices, and infrastructure improvements for the company's West Chester, PA campus. As a member of this committee, I was actively engaged in leading and participating in the SAT's agenda, which included the pursuit of LEED® silver certification for one of the campus' office spaces (approximately 30,000 sqft). As part of this team, I was responsible for evaluating potential credits, developing a technical approach for a multiple number of credits to be pursued, conducting the baseline data collection effort (as applicable), uploading information into the LEED ®Online web-based template, developing cost estimates for implementation, and preparing a master plan for the certification program. The project was advanced to internal budgetary approval for implementation, but the advancement was suspended due to corporate funding priorities.

Design for Wastewater Treatment System Improvements* | Multiple Locations | Project Manager

This multi-national beverage manufacturer retained our company to prepare designs and associated construction bid documentation for improvements to their wastewater treatment operations at several of their bottling facilities located in the U.S. These designs predominantly consisted of segregation, piping, storage, and pH adjustment elements to improve the operability and reduce costs for their existing systems and processes. Specifically, evaluating each of the process waste streams (e.g., flavored wastewater, RO reject water, cooling tower blowdown, filling losses, etc.), segregating these streams for optimal disposition as appropriate, and designing for the associated system modifications to properly collect, treat onsite, and discharge; use for onsite irrigation; and/or collect and transport offsite for proper disposal. As Project Manager, responsible for preparing the technical and cost proposals for each assignment, leading the project team through the design and construction bid preparation phases, leading weekly teleconferences with the expanded client team, and ensuring adherence to project schedule, budget, and quality objectives.

INFRASTRUCTURE DESIGN

Green Ports Initiative Sustainability Assessment | Delaware River Port Authority (DRPA) | Pennsylvania and New Jersey | Project Manager and Lead Engineer

Project Manager and Project Engineer for comprehensive sustainability evaluation of properties and facilities owned by the Delaware River Port Authority (DRPA), Philadelphia Regional Port Authority (PRPA), and South Jersey Port Corporation (SJPC). The assessment included a thorough evaluation of these authorities' current operating practices for identifying areas of improvements with respect to people, planet, and profit. Over 100 total projects were identified and categorized into one of three priority tiers (based on price, impact, ease of implementation, etc.) to provide a road map for these authorities to incorporate into their master and capital improvement plans. The projects were far reaching and encompassed energy, waste management, materials, emissions, work space quality, transportation, sustainable sites, and other aspects. Our team was also instrumental in developing, organizing, and leading a guidance committee of key stakeholders over the course of this assignment (a.k.a., "The Green Ribbon Panel"), and for hosting several public outreach sessions to inform the public of the authorities' sustainability mission. The net result was a voluminous report customized for each of the three authorities, with total company gross revenues exceeding $600,000.

** denotes projects completed with other firms*

Design/Build Renovation for the DeKalb U.S. Army Reserve (USAR) Center | J2 Engineering, Inc. | Maryland | Assistant Project Manager

This project consisted of a full redesign, partial demolition, and reconstruction of an existing military office building to meet the specifications of a Sensitive Compartmented Information Facility (SCIF). The work involved design and reconstruction of an approximately 10,000-square-foot space inclusive of architecture, electrical, lighting, power, plumbing, heating, ventilation, air conditioning (HVAC), fire suppression, fire alarm, data (SIPR, JWICs, and OSIS networks), and telephone systems. As Assistant Project Manager, interfaced routinely with the Project Manager and Site Manager to assess project progress and resolve issues, identified and managed additional scope tasks with various contractors, developed and maintained project schedule using Primavera® Contractor, designed and maintained a project communications and information storage website (proprietary TeamLinkSM). I was the principal lead in terms of designing, engineering, estimating, and managing several components of work scope, including a new fire main installation, data and telephone networks, construction of a low-security computer center (SIPR Café), and several significant alterations to the electrical design. Our team's performance on this project has continuously been acknowledged very positively by all of the respective stakeholders, which has resulted in several scope additions to the original contract.

Design/Build for HVAC and Ventilation Systems, Crossroads Warehouse Facility* | Tennessee | Project Manager

Our client, Haemonetics®, leased a 100,000 sqft warehouse for storage and distribution of healthcare-related medical products. A select portion of these products emitted a potentially-hazardous off-gas, ethylene oxide, as a result of the requisite sterilization process for these materials. Our firm was retained to design, procure, and build a suitable ventilation system to ensure that the air quality in the affected spaces was maintained within the applicable safety standards. Our system entailed three (3) air collection boxes, two (2) 45,000 cfm exhaust fans, a 42,000 cfm make-up air handling unit, and all associated duct work and controls. Due to the success of this assignment, our scope was increased to include design+build services for an air conditioning system to maintain a sensitive storage area at a temperature below 68ºF. The associated conditioning system entailed four (4) 10,000 cfm roof-top units (RTUs) with distribution duct work, grilles, and controls. As Project Manager, I led the design, procurement, subcontractor/subconsultant management, and construction aspects of the project, and served as the lead engineer for reviews and project QA/QC. The systems met the client's performance objectives and the project was completed under-budget and within schedule.

Emergency Generator Maintenance, Amtrak CNOC Facility* | Delaware | Project Manager

Amtrak became aware that the emergency generator's 600-gallon diesel fuel storage tank for their Consolidated National Operations Center (CNOC) had become compromised, and was leaking from the inner tank into the secondary containment interstitial space. The CNOC facility is critical to Amtrak's operations, and a disruption of power would have severe implications for their service capabilities. Stantec was subsequently retained to lead Amtrak through the repair process, which entailed a series of carefully-planned steps with five (5) separate contractors/vendors. In order to perform the requisite maintenance, the entire generator unit and tank, measuring approximately 16-ft long by 10-ft wide and weighing 30,000 lbs, needed to be loaded onto the back of a flatbed trailer and transported to the manufacturer in Virginia. Due to its restricted location on the property, the generator unit had to be lifted via a 120-ton rated crane onto a trailer positioned on a heavily trafficked vehicle bridge. A traffic control subcontractor was retained by Stantec to ensure the safety of the team and public, and Stantec was responsible for procuring the necessary permits to allow for the traffic obstructions. An electrical contractor was retained to perform the necessary service connections/disconnections for the electrical and mechanical elements of the generator, as well as supplying and connecting a temporary generator to supply the CNOC while the permanent generator was offsite getting serviced. Both the outbound and inbound (return) events were completed successfully, safely, within sch

LEED® Certification for Commercial Office Space*, Weston Solutions Building 5* | Pennsylvania | Project Administrator

While employed at Weston Solutions, Inc., a committee [Sustainability Action Team (SAT)] was formed to promote sustainability education, practices, and infrastructure improvements for the company's West Chester, PA campus. As a member of this committee, I was actively engaged in leading and participating in the SAT's agenda, which included the pursuit of LEED® silver certification for one of the campus' office spaces (approximately 30,000 sqft). As part of this team, I was responsible for evaluating potential credits, developing a technical approach for a multiple number of credits to be pursued, conducting the baseline data collection effort (as applicable), uploading information into the LEED ®Online web-based template, developing cost estimates for implementation, and preparing a master plan for the certification program. The project was advanced to internal budgetary approval for implementation, but the advancement was suspended due to corporate funding priorities.

** denotes projects completed with other firms*

PUBLICATIONS & WHITEPAPERS

Published by Philadelphia University. *ECOFARE: Advancing the Course of the Family Dining Experience.*, 2014.

"Cost and Benefit Analysis of Flushing." Published by American Water Works Association Research Foundation (AWWARF) and Kiwa N.V., 2004.

Angus McGrath PhD, BCES

Principal Geochemist

27 years of experience · Nevada City, California

Angus has 26 years of experience in environmental consulting in both organic and inorganic chemistry, with an emphasis on groundwater modeling and remediation. He also spent nearly two decades as a laboratory researcher in both academia and industry capacities, where he worked to develop fully recyclable paper machine oils and patent remediation methods. Angus' experience encompasses project management, technical support, expert testimony, litigation support, feasibility studies, field supervision, and toxic trace element investigations. He has also overseen remedial design for a variety of chlorinated solvents and petroleum hydrocarbons including enhanced in situ bioremediation (EISB or enhanced reductive dehalogenation (ERD), peroxone sparging, permanganate, dual phase extraction, electrical resistance heating (ERH), electro-kinetic remediation (EKR) and groundwater extraction and treatment systems with advanced oxidation. He has worked on projects involving the natural attenuation as well as the enhanced in situ reduction of chlorinated VOCs (CVOCs), hexavalent chromium, and petroleum hydrocarbons; biostimulation of CVOC reductive dehalogenation; Cr (VI) and perchlorate reduction in soil and groundwater; chemical oxidation of petroleum and chlorinated VOCs; evaluation of chlorinated VOC soil vapor migration and intrusion into indoor air; treatability of metal- and organic-bearing wastes; and modeling metal mobility and fate in aquifer materials. Additionally, his geochemical modeling expertise including analysis of ASR wells, municipal waste discharges, and wastewater treatment and testing. Angus has experience helping clients meet strict regulatory requirements.

EDUCATION

PhD, Soil Science/Soil Chemistry, University of California, Berkeley, California, USA, 1994

Bachelor of Arts, Chemistry, Hamilton College, Clinton, New York, 1985

MEMBERSHIPS

Member, American Geophysical Union

Member, American Chemical Society

AWARDS

1994 - 1997 Post-Doctoral Fellow – Department of Energy, Lawrence Berkeley National Laboratory

1992 Graduate Student Award in Environmental Chemistry, American Chemical Society

1993 Carolyn Meek Fellowship, UCB

PROJECT EXPERIENCE

ABOVEGROUND AND UNDERGROUND STORAGE TANK INVESTIGATION

Remediation of Petroleum Hydrocarbons and Fuel Oxygenates | Texas | Consulting Geochemist

Angus served as a consulting geochemist on a project evaluating the potential for natural attenuation for a regional plume sourced by an underground propane bulk storage facility. He was responsible for evaluating the geochemistry of the plume to determine the applicability of natural attenuation as a remedial alternative for the containment of a propane and petroleum hydrocarbon plume. Additionally, he evaluated the transport and natural attenuation of a plume 200 to 300 feet below ground surface (bgs) and performing the work for a multinational corporation in Texas.

ASSESSMENT, HEALTH RISK EVALUATION, AND REMEDIATION OF SOIL VAPOR

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Angus served as consulting Geochemist for a commercial property company that owns hundreds of shopping malls across California and the United States. He designed and implemented soil vapor extraction (SVE) system to remove CVOC from former dry cleaner contamination. He worked successfully with the dry cleaning operator and cleaned up CVOC concentrations using SVE and limited excavation. Additionally, Angus prepared reports to document remediation completed to date and letter for request for closure.

ELECTRICAL COMMISSIONING AND SYSTEM TESTING

Remediation and Assessment of Chlorinated Solvents | Springfield, Missouri | Consulting Geochemist

Angus served as the consulting geochemist on an Electrical Resistance Heating (ERH) project in a karst system. Stantec implemented an ERH pilot study to test the technology in an onsite source area. Angus oversaw feasibility and bench scale testing, as well as design development for the ERH pilot study, ISCO bench scale studies, and 1,4-dioxane stripping efficiency. The pilot study was effective at cleaning up the 2,000-square-foot source area. The full-scale project is currently in the planning stages.

Remediation and Assessment of Chlorinated Solvents | El Centro, California | Consulting Geochemist

Angus served as consulting Geochemist on an Electrical Resistance Heating (ERH) project. He planned and reviewed feasibility tests at a chlorinated solvent site to select the remedy, served as a technical reviewer for ISCO testing and ERH evaluations, and implemented ERH treatment in the remaining source area.

ENVIRONMENTAL ASSESSMENTS

International and Miscellaneous Projects | Sao Paolo, Brazil | Consulting Geochemist

Angus served as consulting geochemist for automobile parts manufacturer. He conducted assessments of geochemical contamination issues at four equipment manufacturing facilities including plating, painting, battery production, and general equipment assembly. He recommended remedial approaches and processes to limit additional contamination.

ENVIRONMENTAL HEALTH & SAFETY

International and Miscellaneous Projects | Consulting Geochemist

Angus served as a consulting geochemist for the training of staff and consultants of a Brazilian subsidiary of a multi-national oil company. He prepared and presented presentations in Portuguese for Brazilian staff and consultants. Additionally, Angus coordinated with Brazilian equipment providers to conduct presentations on health and safety and best work practices.

ENVIRONMENTAL SITE ASSESSMENTS PHASE I, II, III

International and Miscellaneous Projects | Curritiba, Brazil | Consulting Geochemist

Angus served as the consulting geochemist on a Phase I and Phase II assessment of refrigeration system manufacturer and installer. He traveled to Brazil to establish a teaming relationship with the Brazilian consulting firm. This firm would be conducting a Phase I assessment and subsequent Phase II soil borings to determine the extent of groundwater contamination. Angus developed an understanding of the CETESB rules for environmental investigation in Sao Paolo, Brazil. He conducted the work on behalf of a multi-national air conditioning and refrigeration equipment manufacturer.

Remediation of Petroleum Hydrocarbons and Fuel Oxygenates | Northern California | Consulting Geochemist

Angus served as the consulting geochemist on a project evaluating the potential for the application of a natural attenuation remedy at a chlorinated VOC site in northern California. He developed and reviewed data collected using the approved Air Force Center for Environmental Excellence (AFCEE) protocol to determine the applicability of natural attenuation at the site. He conducted bioaugmentation/biostimulation bench scale study to evaluate the potential for the enhancement of natural attenuation using simple carbon food sources with and without microbial (Dehaloccoides ethogenes) amendments. Currently, Angus is conducting a field biostimulation pilot study using a proprietary remedial mixture and performing the work for a multi-national corporation.

ENVIRONMENTAL SITE REMEDIATION

Electrical Resistance Heating (ERH) and Enhanced Reductive Dehalogenation (ERD) Remediation of VOCs | Springfield, Missouri | 2008-Present | Remedial Technical Expert

Angus served as the remediation technical expert for an Electrical Resistance Heating (ERH) treatment combined with ERD in a karst system. Stantec implemented ERH on pilot and full-scale to test the technology in an onsite source area. Angus oversaw feasibility and bench scale testing, as well as design development for the ERH pilot study, ISCO bench scale studies, and 1,4- dioxane stripping efficiency. The pilot study was effective at cleaning up the 2,000-square-foot source area. The first phase of full scale treatment was implemented with an organic acid to control conductivity. Angus designed the conductivity enhancer to stimulate biodegradation post ERH to treat residual VOCs. Additional ERD injections have been conducted to complete the treatment. He treated additional source area with soil mixing injecting zero valent iron, emulsified vegetable oil, and lactate. DNAPL reduction with ERH and ERD was effective. Angus conducted the work for an electronics manufacturer. Evaluation of soil mixing and alternatives for groundwater treatment are ongoing in other source areas. Role: Remedial Technical Expert | Dates involved: 05/2008-present

Remediation of Petroleum Hydrocarbons and Fuel Oxygenates | Northern California | Consulting Geochemist

Angus served as the consulting geochemist on a project evaluating the impact of oxygen infusion technologies for the augmentation of fuel oxygenate biodegradation. He was responsible for performing a remediation technology comparison for the in-situ remediation of methyl tertiary butyl ether (MTBE) at a fuel terminal for a major oil company.

Remediation and Petroleum Hydrocarbons and Fuel Oxygenates | Consulting Geochemist

Angus served as the consulting geochemist on an investigation pertaining to liability of gas station operator with regard to groundwater contamination from historic and present-day gasoline spills. He evaluated site and composition of gasoline spills to assess sources of spills as a function of aging and MtBE concentrations. Additionally, Angus performed work for two environmental engineering and consulting firms.

GROUNDWATER AND GEOCHEMICAL MODELING

International and Miscellaneous Projects | Research Geochemist

Angus served as a research geochemist on an investigation of the pesticide persistence and stability in forested watersheds of Northern California federal government land. He developed analytical capabilities and degradation studies on atrazine, picloram, and triclopyr in a broadcast-spraying operation for shrub control during plantation growth. He performed his work for a U.S. government agency.

Remediation of Petroleum Hydrocarbons and Fuel Oxygenates | Two Major Oil Companies | Consulting Geochemist

Angus served as the consulting geochemist on a project evaluating the biodegradation of tertbutyl alcohol (TBA) by organisms removed from granular activated carbon (GAC) in a pump and treat system. He was responsible for evaluating the potential for GAC inoculation with TBA degrading organisms to remove TBA from extracted groundwater prior to discharge to the storm drain or publicly-owned treatment works (POTW).

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Angus served as the consulting geochemist for a full-scale application of potassium permanganate treatment for chlorinated alkene VOC remediation. He was responsible for developing a reactive barrier to remove CVOCs and prevent off-site migration of contaminants. All work was based on a bench-scale comparison of chemical oxidants screened for this site. Pilot study results indicated that the initial remedial treatment could remove chlorinated VOCs in the treatment area for up to nine months before new flow from upgradient transported more contaminants into the treatment area.

Remediation and Assessment of Chlorinated Solvents | Former Aeronautics Manufacturer | Northern California | Consulting Geochemist

Angus served as the consulting geochemist for the selection and testing of chemical oxidants for the oxidation of chlorinated VOCs at a site. Developed laboratory and field pilot protocol. He tested the oxidant selected through laboratory testing in the field. Chemical indicators revealed that the treatment was effective at degrading the compounds of concern, however hydrogeologic limitations prevent effective field application of the treatment.

Remediation and Assessment of Chlorinated Solvents | New Jersey | Consulting Geochemist

Serving as the consulting geochemist on the review of the applicability of different remedial alternatives for the destruction of CVOCs in a fractured bedrock aquifer, Angus evaluated chemical treatment, natural attenuation, and physical methods for efficacy in treating the chlorinated VOC plume. He performed the work for a multinational personal hygiene products manufacturer.

Lower Floridan Aquifer Storage and Recovery (ASR) Well Injectate Geochemical Modeling | Miami-Dade County | Miami-Dade, FL, USA | Geochemist

Angus performed geochemical modeling for a Lower Floridian ASR project evaluating the potential for precipitate formation in injected water. He and the team used the U.S. Geological Survey’s PHREEQC program to evaluate the potential for precipitate formation for mixed injectate and groundwater to assess the long-term viability of the injection wells.

GROUNDWATER MONITORING AND REPORTING

Landfill, Mining and Heavy Metal | Energy Production and Distribution Company | Northern California | Consulting Geochemist

Angus served as the consulting geochemist for the evaluation of remedial alternatives pilot tested at a nationally recognized groundwater hexavalent chromium contamination site. He provided expert advice on the effectiveness of proposed remedial alternatives and the meaning of pilot test results.

GROUNDWATER TREATMENT

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Served as consulting Geochemist for a pilot study of Fenton’s reagent degradation of chlorinated solvents in groundwater. Conducted a laboratory batch and column study to determine the efficiency of Fenton's reagent degradation of trichloroethene (TCE) and dichloroethene (DCE) in contaminated aquifer material with a moderate to low permeability. Conducted a field pilot study of the technology based on successful bench-scale testing. Performed work for an electronics manufacturer in Northern California.

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Served as consulting Geochemist for a pilot-scale testing of Fenton’s reagent treatment of a contaminated aquifer, using vertical mixing well technology. Conducted technology and site assessment for a listed site contaminated with VOCs and dense non-aqueous phase liquid (DNAPL). Obtained regulatory approval for novel technology testing. Performed work for a multinational corporation at a site in Rhode Island.

Remediation and Assessment of Chlorinated Solvents | Embee Processing | Santa Ana, CA, USA | Geochemist

Angus consulted on the remediation of hexavalent chromium in groundwater beneath a municipal park. The project involved the design and implementation of a chemical reduction treatment consisting of the application of potassium dithionite to site sediments during excavation to provide a 10-year geochemical reactive barrier to influent hexavalent chromium. Angus is currently overseeing groundwater treatment for volatile organic compounds and hexavalent chromium during the final phase of park construction.

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Serving as consulting Geochemist and project manager for a CVOC plume at a state superfund site in northern California for a major microchip manufacturer. Bench and field tested and implemented on a full-scale groundwater treatment for CVOCs using ozone sparging. Implemented ozone sparging using Calcon equipment after difficulty with other equipment manufacturers. Remediated the central portion of the source area and in the process of completing treatment in down gradient source areas

Landfill, Mining and Heavy Metal | Consulting Geochemist

A pilot-scale project for in situ stabilization of nickel and reductive precipitation of chromate in groundwater. Developed an alkaline treatment to precipitate nickel in groundwater and vadose zone soil at one of the largest historical plating facilities in the world in Indiana. Developed a remedial approach for treatment of hexavalent chromium using ferrous iron.

Landfill, Mining and Heavy Metal | Consulting Geochemist

The treatment of extracted groundwater impacted with hexavalent chromium. Designed and operated a flow through treatment system for the reduction and precipitation of hexavalent chromium in groundwater removed during dewatering of an excavation. Performed the work for a municipality in Northern California.

Landfill, Mining and Heavy Metal | Consulting Geochemist

A remediation project reducing and precipitating Cr (VI) site wide in vadose zone soils and groundwater using ferrous iron treatment. Reduced groundwater hexavalent chromium concentrations in situ site-wide at an active aeronautics plant using a method SECOR developed and received United States Environmental Protection Agency (USEPA) approval for. Currently evaluating the effectiveness of groundwater treatment, awaiting soil closure, and applying for site closure. Performing work for an industrial client in Southern California.

Landfill, Mining and Heavy Metal | Consulting Geochemist

Served as a consulting Geochemist on a project where a hexavalent chromium plume is threatening a series of domestic drinking water wells. Evaluated the geochemistry of the aquifer, the remedial options for in situ and ex situ treatment, the stressors on the aquifer and modeled groundwater movement. Installed a more effective groundwater extraction system, an above ground chemical treatment system for hexavalent chromium and an in situ pilot biological hexavalent chromium treatment system. Reduced overall costs for groundwater disposal by approximately $500,000 per annum. Performing work for a major oil company in West Texas.

HEALTHCARE

Confidential Project | Confidential Client | 2006

Mr. McGrath participated on the team that conducted a combined environmental and geotechnical evaluation of a former NASA industrial plant that was to be demolished and redeveloped as a hospital and medical office building complex. The NASA facility was utilized for Gemini, Apollo, and Space Shuttle testing, and included an airfield, hazardous material storage, and cryogenic and physical testing areas. The project involved historical research to locate former hazardous material usage and storage areas; drilling and sampling of soil, soil vapor, and groundwater to evaluate impacts; combining the geotechnical and environmental sampling for efficiency and cost savings; assessment and health risk (PEA) reports for evaluation of worker and site user health risk and for submission to the California DTSC; asbestos and hazardous material abatement reports for demolition purposes; geotechnical reports for site grading, foundation, pile, and liner design, and backfill requirements; construction oversight; and participation with client legal counsel in negotiations with state regulatory agencies. Remedial oversight was also conducted, and we coordinated with the client, contractor, adjacent landowners, the City, and regulatory agencies.

PFAS INVESTIGATION AND MITIGATION

Eielson Air Force Base Confidential Client | Fairbanks, Alaska | Technical Advisor

Stantec was contracted to prepare an engineering evaluation and cost analysis for treatment EE/CA of PFAS impacted soils in accordance with USEPA and USAF guidance. Stantec is evaluating ARARs developing cleanup objectives and evaluating possible treatment technologies for in situ and ex situ soil treatment, as well as possible disposal alternatives for leached PFAS and or stabilized soils. Alternative evaluation includes an evaluation of mature technologies that have the potential to achieve removal action objectives. Work is currently in process.

Manufacturing Facility Confidential Client | Stanton, California | Technical Advisor

Stantec was contracted to prepare the work plan and conduct a site investigation for PFAS at a metal plating facility in Stanton, California in response to the State Water Resources Control Board (SWRCB) order to metal plating facilities. Angus developed work plans, negotiated with the local Regional Water Quality Control Board (RWQCB) to obtain approval for the proposed scope of work. Work was referred to the Department of Toxic Substances Control (DTSC) by the RWQCB. Stantec is currently preparing a work plan and negotiating with regulators regarding in situ treatment/stabilization of PFAS using injectable stabilizing agents.

Manufacturing Facility Confidential Client | Santa Ana, California | Technicial Advisor

Stantec was contracted to prepare a work plan and conduct a site investigation for PFAS at a metal plating facility in Santa Ana, California in response to the State Water Resources Control Board (SWRCB) order to metal plating facilities. Angus developed work plans, negotiated with the local Regional Water Quality Control Board (RWQCB) to obtain approval for the proposed scope of work. Work was referred to the Department of Toxic Substances Control (DTSC) by the RWQCB. Investigation is ongoing.

Bulk Fuel Terminals Confidential Client | Northern California | Technical Advisor

Stantec was contracted to prepare work plans to conduct site assessments for PFAS at two bulk fuel terminals in Northern, California in response to the State Water Resources Control Board (SWRCB) order to bulk fuel terminals and refineries. Angus developed a facility questionnaire used by the client for all of their California facilities and oversaw preparation of the work plans. Work is ongoing.

Bulk Fuel Terminals Confidential Client | Northern California | Technical Advisor

Stantec was contracted to prepare a work plan to conduct site assessments for PFAS at a bulk fuel terminal in Northern, California in response to the State Water Resources Control Board (SWRCB) order to bulk fuel terminals and refineries. Angus developed a facility questionnaire used by the client for all of their California facilities and oversaw preparation of the work plan. Work is ongoing.

Manufacturing Facility Confidential Client | Minnesota | Technical Advisor

Provided consulting services to a confidential client for a manufacturing facility, where the historic use of PFAS chemicals in the manufacturing process potentially impacted the soils, surface water, and building materials at the site. Long term uses of PFAS containing materials in a manufacturing process led to the evaluation of potential releases to the environment. The project included development of a conceptual site model that identified potential routes of uncontrolled discharge including: wastewater, air dispersion, and solid waste. In the light of the ubiquitous nature of PFAS in the environment, the investigation required that PFAS releases from the Site to be distinguished from background distribution as a result of widespread use in industrial and consumer products. Key project execution tasks included preparation of work plans, execution of investigation activities, data analysis, forensics and statistical interpretation.

Former Chromium Plating Facility | Southern California | Subject Matter Expert

In his role as subject matter expert in the fate and transport of PFAS, advised on the potential fate of PFAS related to use as a fume suppressant at a former plating facility. The client received an order from the Los Angeles Regional Water Quality Control Board to evaluate the potential release of PFAS to the environment. Activities included a review of available historical documentation at the Site, evaluation of potential routes of release, evaluation of the potential fate and transport of PFAS from the Site, and development of a Work Plan for collection of groundwater samples from existing groundwater monitoring wells at locations where historical chromium impacts in groundwater have been identified. The request to rescind the order was submitted to the RWQCB and is under review.

Refinery Confidential Client | New Jersey | Technical Advisor

Stantec was contracted to develop a work plan to conduct an investigation of PFAS impacts to soil and groundwater at a fire training area within a refinery. Angus contributed to the preparation of the sampling plan and development of the sampling and analysis plan for the investigation. Stantec evaluated the PFAS analytical data for soil and groundwater and is developing a plan to address observed concentrations in soil and groundwater at the site.

Bulk Liquified Gas Terminal Confidential Client | Southern California | Technical Advisor

Stantec was contracted to prepare a response to the RWQCB PFAS order providing evidence that the facility never used PFAS for fire suppression at the site. If arguments are not accepted Stantec will also prepare a work plan for impacts to soil, stormwater, and groundwater at multiple bulk terminals in California under the RWQCB PFAS order to bulk terminals and refineries. Angus contributed to the preparation of a facility questionnaire and the work plans for the investigations.

Former Bulk Terminal Confidential Client | Oregon | Technical Advisor

Stantec was contacted by a client to evaluate a site for potential PFAS impacts in soil and groundwater based on work conducted by third party on the site. Historical fire suppression during a large tank fire at the site was the likely source of PFAS in groundwater. Evaluation is ongoing.

Due Diligence Confidential Client | New Hampshire | Technical Advisor

Stantec was contracted to conduct due diligence at multiple properties as part of an infrastructure expansion. PFAS was analyzed and detected in groundwater at a car wash facility per New Hampshire Department of Environmental Services guidance which identified car washing as a source of PFAS. Stantec identified PFAS in groundwater and developed conceptual costs for additional characterization and remediation/mitigation for negotiation in land acquisition.

IN SITU BIOMONITORING

In Situ Treatment of VOCs, ClO4 & Cr(VI) | Santa Ana, California | 2010-Present | Geotechnical Lead

Angus worked with a plating and precision machining company evaluating wastewater treatment alternatives and is working with vendors to implement the identified technology. Angus also conducted feasibility studies, evaluated and implemented remedial alternatives for in situ biological and chemical treatment of hexavalent chromium, perchlorate, and chlorinated VOC (CVOC) in a commingled groundwater plume at the site. He tested and is currently implementing in situ biologically mediated reductive treatment for hexavalent chromium, perchlorate and CVOCs. He evaluated options and designed a water recycling system for process water at the facility. Angus pilot tested and is currently implementing full-scale in situ biologically mediated reductive treatment for hexavalent chromium, perchlorate and CVOCs. He conducted a pilot test of electro-kinetic remediation and served as expert witness in litigation for regional impacts. Angus is conducting subslab soil vapor sampling, vapor intrusion assessment and indoor air evaluation. He conducted a pilot test of electro-kinetic remediation and served as expert witness in litigation for regional impacts. He is performing work for a multinational aeronautics parts manufacturer plating and precision machining division and is performing work for a Southern California plating and precision machining company. Construction: 2010 and 2016. Role: Geotechnical Lead | Cost: Unknown | Dates involved: 01/2010-Ongoing

Full Scale In Situ Biodegradation | Sacramento, California | 2012-2017 | Project Manager

Angus oversaw feasibility studies, design and implementation of an in situ oxygenation system to treat petroleum hydrocarbon on a bulk terminal, including the procurement of all appropriate permits. Angus oversaw the effectiveness evaluation of biodegradation treatment and the impact of oxygenation on hydrocarbon biodegradation and the microbial community. He also prepared a publication on the treatment results and worked with a multi-discipline team to evaluate microbial degrading community and treatment effectiveness. Role: Project Manager | Cost: Unknown | Dates involved: 06/2012-2017

Remediation of Petroleum Hydrocarbons and Fuel Oxygenates | Consulting Geochemist

Served as consulting Geochemist for the development of a guidance document for the implementation of in situ biotreatment of petroleum hydrocarbons and fuel oxygenates in groundwater. Contracted by the American Petroleum Institute (API) to research and compile literature on in situ biobarriers and develop a guidance document for the implementation of aerobic biobarriers. The publication is currently in review with API.

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Served as consulting Geochemist for the evaluation of commingled CVOC plumes using compound-specific stable isotope techniques and treated the source are with in situ chemical oxidation (ISCO) at a marine terminal. Evaluated the stable isotope signatures of source and reductive dehalogenation breakdown daughter products both on-site and from other upgradient sources. Developed an opinion for the client regarding the isotopic signature observed. Tested and implemented potassium permanganate treatment of CVOCs for the source area. Completed source area treatment and developed plan for site wide remediation.

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Serving as consulting Geochemist for the development of a guidance document for the implementation of in situ biotreatment of petroleum hydrocarbons and fuel oxygenates in groundwater. Researched and compiled literature on in situ biobarriers and developed a guidance document for the implementation of aerobic biobarriers on behalf of the American Petroleum Institute. The publication is currently in review with API.

MIXED-USE

Port of San Diego Rohr Facility | Unified Port of San Diego | Chula Vista, California, US | 2000

Mr. McGrath participated in a detailed subsurface assessment of the Rohr facility. The intent of the assessment was to evaluate the 40-acre former aircraft part manufacturing facility for acquisition by the Port of San Diego for redevelopment into a business park and entertainment complex. The assessment identified the presence of soil, soil vapor, and groundwater impacts by petroleum hydrocarbons, VOCs, heavy metals, PCBs, and semi-volatile organic compounds. He utilized many sampling techniques to assess the limits and concentrations of contaminants in the subsurface. Ultimately, the team was able to develop a cost estimate for potential remedial action cost associated to corrective action to allow redevelopment.

REMEDIAL SYSTEM INSTALLATION

Remediation and Assessment of Clorinated Solvents | Consulting Geochemist

Serving as consulting Geochemist selecting and installing a site-wide remedial system to degrade chlorinated VOCs and petroleum hydrocarbons at a former circuit board fabrication facility. Evaluated and implemented the installation of an ozone sparging and soil vapor extraction system to remove and oxidize VOCs in groundwater below the proposed multinational corporate headquarters. Performing the work for a multinational electronics manufacturer in Northern California.

SITE MANAGEMENT AND REMEDIATION

Electronics Manufacturer ERD Treatment of VOCs | Palo Alto, California | 2004-Present | Project Oversight

Angus oversaw the design, bench scale, pilot scale and full scale implementation ERD treatment at a former electronics manufacturing facility in Northern California. The site transitioned from groundwater extraction to monitored natural attenuation (MNA) but residual CVOCs in soils required additional treatment. Angus tested several different carbon substrates formulations and obtained a license to use specially denatured alcohol. The treatment has achieved remedial objectives and additional remediation is not required. Role: Project Oversight | Cost: Unknown | Dates involved: 09/2004-Ongoing

Gas Migration Investigation | Cabot Energy | Bradford County, PA, USA | 2012-Present | Geochemist

When the Pennsylvania Department of Environmental Protection confirmed that gas well drilling operations had impacted the water supply by issuing a Notice of Violation (NOV), Angus served as Geochemist for a gas migration investigation into methane and turbidity issues in potable wells and evaluation of potential water impacts to drinking water wells. Mitigation efforts included installation of water treatment systems at select properties and vents at select potable wells, implementation of remedial cement enhancements in gas wells, analysis of gas and water samples for isotopic analysis, and monitoring of potable well headspace. A Response Closure Report was submitted to the PADEP for closure under PA Code Chapter 78.89.

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Serving as consulting Geochemist for a project where the client purchased cost cap insurance and transferred long-term responsibility for remediation and remedial operations to SECOR. Operated pump and treat system until asymptotic and followed with limited ISCO using potassium permanganate to treat chlorinated ethenes. ISCO dramatically reduced CVOC concentrations across the site.

SOIL AND GROUNDWATER REMEDIATION SYSTEMS

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Served as consulting Geochemist on the review of the applicability of different remedial alternatives for the destruction of CVOCs and petroleum hydrocarbons in groundwater at a site in Scotland, UK. Evaluated the geochemistry and the hydrogeology to determine which remedial alternative available would be most suitable for remediation of the site. Performed the work for a multinational electronics manufacturer in Northern California.

Remediation and Assessment of Chlorinated Solvents | Consulting Geochemist

Serving as consulting Geochemist on a natural attenuation project for hexavalent chromium contamination in groundwater at a landfill for a brick manufacturer. Conducted geochemical analyses of soil and groundwater, evaluated the feasibility of remedial alternatives, and implemented natural attenuation based on geochemical indicators and risk evaluations. Performing work for a Southern California brick manufacturer.

Landfill, Mining and Heavy Metal | Consulting Geochemist

Served as a consulting Geochemist on a project evaluating the acid generating potential of soils and drilling spoils from oil exploration in pristine wilderness in Venezuela. Modeled the acid generating potential of drilling spoils and evaluated the acid neutralizing capacity of the surficial soils and receiving waters. Evaluated the potential to maintain anoxic conditions to prevent acid generation. Conducted the work for a multi-national oil exploration firm.

SOIL AND WATER QUALITY ASSESSMENTS

International and Miscellaneous Projects | Geochemist

Served as Geochemist on a project studying the use of colloidal silica barriers for actinide and mixed-waste containment. Responsible for developing studies on soil characterization and interactions between colloidal silica and soil matrices, and measuring water retention properties of soils. Performed work for a U.S. Government agency.

Background Arsenic in Soil Evaluation | Wyoming | Technical Advisor

Stantec was contracted to evaluate USGS and DEQ soil data to develop a background concentration for arsenic in soil. Angus served as the technical lead for the evaluation of databases and development of ProUCL assessment of arsenic concentrations in soil across the state and compared proposed levels and methodology with neighboring states.

Evaluation of Arsenic Treatment | Brick Manufacturer | Salt Lake City, UT, USA | Geochemist

As Geochemist, Angus consulted on treatability studies for process water at a brick manufacturer where furnace scrubber water required treatment for arsenic prior to disposal. Stantec evaluated arsenic speciation and precipitation properties with various reagents and developed a conceptual process treatment design. The City of Salt Lake provided the business a temporary waiver for arsenic disposal and the design was never implemented.

STEEL & METALS

Chromium Plating Building Remediation | Embee Inc. | Santa Ana, California, US | 2010

Mr. McGrath was responsible for an Initial Study and Negative Declaration prepared pursuant to CEQA with the purpose to reduce concentrations of contaminants of concern (COC) beneath the chromium plating building, as well as to isolate the areas most impacted. In addition, the IMWP addresses treatment downgradient along the southern property boundary to prevent hexavalent chromium and perchlorate migration onto the neighboring property and into their proposed groundwater VOC treatment system. We evaluated several alternatives and conducted a six-month pilot study of the proposed remedial technology and submitted a Pilot Study Report in 2006 to the DTSC. Based on the pilot study, we proposed full-scale implementation of the in situ treatment using a network of injection wells. The treatment includes weekly injections of substrate into the network of wells using a below-grade piping network connected to an automated dosing. Dosing in the downgradient southern property boundary wells is performed manually on a weekly basis. An Interim Measures Installation and Implementation Report (IMIIR) is currently being developed.

SOIL QUALITY ASSESSMENT

Landfill, Mining and Heavy Metal | Consulting Geochemist

Served as a consulting Geochemist for the stabilization of acid impacted soils from metal and asphaltic sludges. Evaluated that acid neutralizing requirement for soils and sludges for in situ stabilization. Conducted field stabilization pilot study to demonstrate remedial strategy effectiveness. Conducted the work for a multi-national oil company.

STORMWATER MANAGEMENT

Carquinez Bay Outfall Design and Modeling | Confidential | San Francisco, CA, USA

Angus consulted on the design and model parameters for a wastewater/stormwater outfall in the Carquinez Strait of San Francisco Bay. The project scope included development of a database for water temperature and solution parameters to determine design requirements for a deep-water discharge. Work was performed for an environmental engineering firm.

WASTE MANAGEMENT

Landfill, Mining and Heavy Metal | Consulting Geochemist

Served as a consulting Geochemist for the column testing of stabilization processes for chromite ore process residue COPR wastes. Developing remedial treatments for hexavalent chromium in COPR wastes and conducting a column test to determine the leachability of the stabilized wastes.

Landfill, Mining and Heavy Metal | Consulting Geochemist

For metal waste stabilization for hazardous waste landfills across the country developing treatment methods for different waste streams such as chromite ore process residue (COPR). Currently on retainer to design evaluate treatability tests for a hazardous landfill operator.

Landfill, Mining and Heavy Metal | Consulting Geochemist

To recycle zinc from metal hazardous wastes for a solid waste landfill. Evaluated pyrometallurgical and hydrometallurgical processes for recycling zinc from metal wastes. Developed a summary of available technologies and feasible processes.

WASTEWATER TREATMENT

International and Miscellaneous Projects | Consulting Geochemist

Served as consulting Geochemist on treatability studies for wastewater treatment and testing for a freeway reconstruction project in Northern California. The project included ongoing review and development of wastewater treatment technologies for heavy metals (Hg, Cd, Ag, Pb, As, Ag, Cr), trace elements, and synthetic organic contamination projects (BTEX and VOCs). Prepared client for expert witness testimony. Performed work for two companies in Berkeley, California. Developed a high-volume treatment system for arsenic removal from groundwater using an aboveground treatment plant in combination with heavy metal removal.

Landfill, Mining and Heavy Metal | Consulting Geochemist

A plating and precision machining company evaluating wastewater treatment alternatives and working with vendors to implement the identified technology. Also evaluating remedial alternatives for treatment of hexavalent chromium, perchlorate, and chlorinated VOC (CVOC) in a commingled groundwater plume at the site. Testing in situ biologically mediated reductive treatment for hexavalent chromium, perchlorate and CVOCs. Performing work for a Southern California plating and precision machining company.

WATER TREATMENT

International and Miscellaneous Projects | Consulting Soil and Aquatic Chemist

Served as consulting Soil and Aquatic Chemist on studies to determine the cause and remedial action required for plugging of rapid infiltration disposal beds for municipal waste discharges. Assessed the impact of redox conditions, algal cell growth, and water table fluctuations on the permeability of treatment beds, and proposed new treatment designs for a pilot study. Performed work for a city in Northern California and an engineering firm.

International and Miscellaneous Projects | Geochemist

Served as Geochemist on a multidisciplinary project related to selenium contamination and cycling in the San Francisco Bay, California. Responsible for work plan development, and design of field and laboratory activities, including sampling of water, sediments, algae, and plants, and refining analytical capabilities for trace metal quantification. Responsible for data evaluation and conceptual model development. Performed work for the area Regional Water Quality Control Board (RWQCB) and a U.S. Government national laboratory.

Landfill, Mining and Heavy Metal | Consulting Geochemist

Served as a consulting Geochemist on a project to remove trace level antimony and arsenic contamination from drinking water for a water supply system in Utah. Developed a water treatment technology that was able to decrease antimony from 20 micrograms per liter (µg/L) to less than 2 µg/L in order to meet USEPA water quality requirements. Tested and implemented the technology on a pilot scale. Changes in regulatory requirements have reduced the pressure on full-scale implementation. Performed the work for a small municipality in one of the Salt Lake City ski valleys.

Landfill, Mining and Heavy Metal | Consulting Geochemist

Mine closure to evaluate and model the geochemistry of mine water quality. Conducted geochemical simulations of mine water quality to determine what natural controls were present to prevent heavy metal dissolution and total dissolved solids from increasing in mine drainage water. Demonstrated that natural precipitation processes control heavy metal and total dissolved solids (TDS) concentrations without additional controls. Performed work for a mining client in Alaska.

CHLORINATED SOLVENTS REMEDIATION

Electronics Manufacturer ERD Treatment of VOCs | Palo Alto, California

Oversaw the design, bench scale, pilot scale and full-scale implementation of Enhanced Reductive Dehalogenation (ERD) treatment at a former electronics manufacturing facility in Northern California. The site transitioned from groundwater extraction to monitored natural attenuation (MNA) but residual CVOCs in soils required additional treatment. Angus tested several different carbon substrates formulations and obtained a license to use specially denatured alcohol. Stantec has achieved source control and is addressing residual sources that were previously inaccessible for remediation. Residual DNAPL treated with ERD and VOC concentrations have decreased to below cleanup levels in a majority of wells.

ZVI Barrier Assessment for Treatment of VOCs | South Carolina

Conducted a review of a zero-valent iron permeable reactive barrier (ZVI PRB) wall installation to evaluate problems with reactivity and permeability of the barrier. Conducted a failure analysis to assess the causes of the loss of permeability and reactivity. Developed a plan for mitigation of design flaws by incorporating ERD for treatment of chlorinated VOCs

Soil Vapor Mitigation using ERD Treatment of VOCs | San Bruno, California

Developed and oversaw the design, bench scale and pilot scale implementation of ERD treatment at a former electronics manufacturing facility in Northern California. Regulatory concerns regarding soil vapor and potential migration to surface water resulted in the selection of ERD as the remedy of choice. Full-scale bioaugmentation using KB-1 implementation is on-going. Work was performed for a defense contractor.

ZVI PRB Augmentation with Enhanced Reductive Dehalogenation (ERD) | North Dakota

Conducted a review of a ZVI PRB wall installation on behalf of an electronics manufacturer to address contamination circumventing the barrier and not addressed by the barrier. Evaluated barrier efficiency and developed a plan for augmentation with ERD injections. Site wide treatment in progress. Work conducted for a confidential electronics manufacturing client.

ZVI PRB Enhancement | Colorado

Conducted a review of a ZVI PRB wall installation, feasibility study and developed a design for ERD to address problems with reactivity and VOCs circumventing the barrier. Developed a remedial approach that targeted the remaining source area and potential leaks in the barrier. Conducted multiple rounds of ERD to address remaining contaminant mass. Remediation is ongoing for a confidential aeronautics client.

In Situ Treatment of VOCs, ClO4 & Cr(VI) | Santa Ana, California

Worked with a plating and precision machining company evaluating wastewater treatment alternatives and working with vendors to implement the identified technology. Angus also evaluated and implemented remedial alternatives for in situ biological and chemical treatment of hexavalent chromium, perchlorate, and chlorinated VOC (CVOC) in a commingled groundwater plume at the site. Tested and currently implementing in situ biologically mediated reductive treatment for hexavalent chromium, perchlorate and CVOCs. Evaluated options and designed a water recycling system for process water at the facility. Pilot tested and currently implementing, full-scale in situ biologically mediated reductive treatment for hexavalent chromium, perchlorate and CVOCs. Conducted a pilot test of electro-kinetic remediation. Conducted a pilot test of electro-kinetic remediation. Conducting evaluations for Electrical Resistance Heating. Currently, conducting subslab soil vapor sampling, vapor intrusion assessment and indoor air evaluation. Served as expert witness in litigation for regional impacts. Performing work for a multi-national aeronautics parts manufacturer plating and precision machining division.

ERH Treatment of VOCs and Hexavalent Chromium

Angus provided technical support and participated in the design and implementation of a bench tests for a mixed chlorinated solvent and hexavalent chromium site in collaboration with an ERH vendor. Work was performed by Stantec's treatability testing laboratory.

Residual VOC Source Treatment using ERD | Santa Clara, California

Stantec was retained to test different in situ chemical oxidation (ISCO) techniques at a former electronics research facility in Northern California. Angus developed and oversaw the design, bench scale and pilot scale implementation of ISCO and subsequently ERD. ISCO was successfully used to treat three of four source areas for CVOCs. The remaining source area was a mixed solvent source with high concentrations of xylenes and ethylbenzene. Stantec performed an ERD pilot test in this area. Pilot test is complete and successful; project awaiting client authorization for full-scale implementation.

Electrical Resistance Heating (ERH) and Enhanced Reductive Dehalogenation (ERD) Remediation of VOCs | Springfield, Missouri

Served as the remediation technical expert for multi-phases of Electrical Resistance Heating (ERH) treatment combined with ZVI soil mixing with ERD in a karst system. Stantec implemented ERH on pilot and full-scale within two treatment areas to test the technology in an onsite source area and conduct full-scale implementation. Angus provided technical support for feasibility and bench scale testing, as well as design development for the ERH pilot study, ISCO bench scale studies, and 1,4-dioxane stripping efficiency. The pilot study was effective at remediating the 2,000-square-foot source area. First phase of full scale treatment was implemented with an organic acid to control conductivity. Angus designed the conductivity enhancer to stimulate biodegradation post ERH to treat residual VOCs. Additional ZVI/ERD injections and soil mixing have been conducted to complete the treatment. Treated additional source area with soil mixing injecting ZVI, emulsified vegetable oil and lactate. DNAPL reduction with ERH and ERD was effective. Conducted the work for an electronics manufacturer.

ERH Treatment of VOCs | San Diego, California

Planned and reviewed feasibility tests at a chlorinated solvent site to select the remedy, served as a technical reviewer for ISCO testing and ERH evaluations, and assisted with the design for the implementation of ERH treatment in the remaining source area. Work was conducted for a property developer in Southern California.

FORENSIC INVESTIGATIONS

Stable Isotope Forensic Evaluation

Conducted a forensic evaluation of multiple petroleum hydrocarbon releases at a refinery for a confidential client. Designed the forensic approach and implemented characterization using isotopic analysis to distinguish recent and historical releases across a large site. Developed an argument for allocating responsibility for different portions of the site.

Forensic Evaluation Fuel Terminal

Conducted a forensic evaluation of multiple petroleum hydrocarbon releases at a fuel terminal. Designed the forensic approach and implemented characterization to distinguish recent and historical releases based on the composition of the spill in different areas of the site. Conducted the work for a confidential client.

Forensic Evaluation | Multiple Sites

Conducted a forensic evaluation of multiple petroleum hydrocarbon releases at several multiparty site. Developed a sampling plan and an argument for allocating responsibility for different portions of the site based on the composition of the spill in different areas of the site. Conducted the work on behalf of a confidential client.

Isotopic Evaluation of CVOCs

Evaluated commingled CVOC plumes using compound-specific stable isotope techniques at a marine terminal. Evaluated the stable isotope signatures of source and reductive dehalogenation breakdown daughter products both on-site and from other upgradient sources. Developed an opinion for the client regarding the isotopic signature observed.

Forensic Evaluation of VOCs | Vancouver, Washington | Technical Advisor

Angus conducted an evaluation of compound specific gas chromatography mass spectra to identify different isotopic signatures in different sources of chlorinated VOCs in groundwater. Developed conceptual site model for the migration and sources of contamination in groundwater adjacent to a major river in Vancouver, Washington. Performed the work for a port facilities operator.

DEVELOPMENT PROCESS REVIEW

American Petroleum Institute Guidance Document

Developed a guidance document for the implementation of in situ biotreatment of petroleum hydrocarbons and fuel oxygenates in groundwater. Researched and compiled literature on in situ biobarriers and developed a guidance document for the implementation of aerobic biobarriers on behalf of the American Petroleum Institute. The publication is currently in review with API.

Evaluation of In Situ Remediation for Petroleum Products

Conducted feasibility evaluations, pilot tests and full-scale implementation innovative remedial methods ranging from oxygenation, chemical oxidation, and in situ biodegradation (stimulated by sulfate, hydrogen peroxide, and oxygen injections). Conducted work on multiple sites for major petroleum clients.

Private Client Guidance Document

Developed a guidance document for the implementation of in situ biotreatment and chemical oxidation of petroleum hydrocarbons and fuel oxygenates in groundwater. Researched and compiled literature on in situ biological treatment and chemical oxidation and developed a guidance document. The publication was prepared for a major Oil Company.

PUBLICATIONS & WHITEPAPERS

Methods for Characterizing the Source of Migrating Methane. *RemTec Summit. Westminster, Colorado*, 2015.

Successful Remediation of Hexavalent Chromium in a Drinking Water Aquifer using In-Situ Treatment of Overlying Perched Groundwater Zone. *Battelle Conference on the Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California, Proceedings*, 2014.

Electro-Kinetic Enhanced Treatment of Hexavalent Chromium Treatment. *Battelle Conference on the Remediation of Chlorinated and Recalcitrant Compounds. Monterey, California, Proceedings*, 2014.

Tools for Evaluating Sources of Natural Gas in Unconventional Gas Production Areas. Presentation. *American Chemical Society Conference, San Francisco, California*, 2014.

Potential Environmental Impacts of Hydraulic Fracturing. *Industrial Environmental Association, San Diego, California*, 2013.

An Overview of the Potential Environmental Impacts of Hydraulic Fracturing. *San Diego Environmental Professionals Association, San Diego, California*, 2012.

Hexavalent Chromium Treatment Using Electrical Resistance Heating (ERH). *Battelle Conference on the Remediation of Chlorinated and Recalcitrant Compounds. Monterey, California, Proceedings*, 2012.

Fate and Transport of Select Hydraulic Fracturing Compounds of Potential Concern. *US EPA Technical Workshops for the Hydraulic Fracturing Study – Fate and Transport, Alexandria, Virginia*, 2011.

An Evaluation of Methane in Drinking Water in the Marcellus Shale Region. *AEHS Conference, Amherst, Massachusetts*, 2011.

API Guidance Document – Draft In Situ Aerobic Biobarrier Implementation Guidance Document. *Petroleum Hydrocarbon and MTBE Treatment Evaluation*, 2005.

Evaluation and Mitigation of Landfill Gas Impacts on Cadmium Leaching from Native Soils. *Groundwater Monitoring and Remediation*, 2007.

Bench Scale Evaluation of Ex Situ and In Situ Cr (VI) Remedial Methods. *In Chromium (VI) Handbook*, 2004.

Microbubble Oxidation of MtBE and BTEX. *Contaminated Soil Sediment and Water*, 2001.

Selenium Cycling in Estuarine Wetlands: Overview and New Results from the San Francisco Bay. *Environmental Chemistry of Selenium*, 1999.

A Design Study for the Isolation of the 281-3H Retention Basin at the Savannah River Site using Viscous Liquid Barrier Technology. *LBNL Annual Report*, 1996.

Degradation of 2, 4-dichlorophenoxyacetics Acid by Birnessite Catalysis. *Physiochemical and Engineering Aspects*, 1996.

Selenium Fractionation and Cycling in the Intertidal Zone of the Carquinez Strait. *LBNL Annual Report*, 1996.

Spectroscopic Characteristics of Forest Floor Aqueous Extracts II: Effects of Fertilization and Herbicides. *Soil Sci. Soc. of Amer., 59:1723-1731*, 1995.

Spectroscopic Characteristics of Forest Floor Aqueous Extracts I: Pine and Understory Litter. *Soil Sci. Soc. of Amer. 59:1715-1722*, 1995.

PhD Thesis, UCB. *Adsorption and Abiotic Degradation of Aromatic Amines on Birnessite and Ferrihydrite: Impact on Soils*, 1994.

In: Proc. of the 13th Annual Forest Vegetation Management Conference, Eureka, California, pp. 45-53. *Soil Reactions with Natural and Synthetic Organic Compounds*, 1992.

White Paper - Mixed AFFF PFAS and Hydrocarbon Wastewater Treatment Alternatives. Prepared for Air Force Civil Engineering Center (AFCEC). October 5, 2020., 2020.

PRESENTATIONS

Summary article - Poly- and perfluoroalkyl substances experts Symposium 2: Key advances in poly- and perfluoroalkyl characterization, fate, and transport. Remediation Journal. 2021;1-10 – online.. *PFAS Expert Symposium, Virtual Conference. June 22-24, 2021.*, 2021.

Promising Amendment Mixtures for In Situ Remediation of High TCE & Sulfate Groundwater using Combined Electron Donors, PAC, mZVI, and/or PAC/ZVI. (accepted and cancelled). *Battelle Conference on the Remediation of Chlorinated and Recalcitrant Compounds. Portland. June 27-July 1, 2021.*, 2021.

Per- and Polyfluoroalkyl Substances (PFAS) in Landfill Leachate: Assessment and Management. . *Waste Expo. Las Vegas, NV. April 26-29, 2021.* , 2021.

PFAS Challenges and Solutions for Industrial Sites. . *Industrial Association of Contra Costa County. Virtual. July 16, 2020*, 2020.

PFAS: What is it, why does it matter, and how do we treat it? . *Midwestern States Environmental Consultants Association (MSECA). Virtual. May 20, 2020*, 2020.

Craig Gendron PG, PE, LSRP

Principal

39 years of experience · Auburn, New Hampshire

Craig is a professional hydrogeologist and engineer with over 36 years experience in hydrogeology, contaminant fate and transport, site cleanup, engineering, risk management, and water resource studies. He has worked in the oil and gas industry specializing in geophysical logging and structure mapping, and with the Illinois State Geological Survey delineating aquifers and hydrogeologically characterizing underground waste injection horizons. He applies his scientific and engineering background to the investigation/clean-up of utility, industrial, commercial, and state release sites, contaminant assessment, risk management, permitting, designing innovative and cost-effective clean-up remedies, and site civil/development elements. Craig commonly applies these skills in support of claims litigation.

His work at environmentally-impacted properties has included the preparation of a number of civil Site Plans as part of the overall remediation system design submittals. These Site Plans have included support building locations, utilities, easements, setbacks, and numerous other civil elements. He has also completed numerous SPCC Plan Reviews, UST removal/replacement designs, and hydraulic lift/gas trap removal/replacements.

Craig is responsible for overseeing the workplan and quality assurance plan preparation, budget control, subcontractor interaction, client correspondence, and report review. In addition to his direct project involvement, he is responsible for managing the technical quality of the staff and other technical resources as a Principal and Managing Lead for the Environmental Remediation Practice.

EDUCATION

M.S. Civil Engineering, University of Illinois, Urbana-Champaign, Illinois, 1988

B.S. Geological Engineering, Colorado School of Mines, Golden, Colorado, 1984

REGISTRATIONS

Licensed Site Remediation Professional, State of New Jersey

Professional Engineer #GE40046, State of New Jersey

Professional Geologist #567, State of New Hampshire

Professional Geologist #1910, State of Tennessee

Certified Subsurface Evaluator #0020985, State of New Jersey

Professional Engineer #37929-006, State of Wisconsin

Professional Engineer #21908, Commonwealth of Kentucky

Professional Engineer #PE10100781, State of Indiana

Professional Engineer #21187, State of South Carolina

Professional Engineer #47737, State of Michigan

Professional Engineer #062-054626, State of Illinois

Professional Engineer #0402 034368, Commonwealth of Virginia

Professional Engineer #25231, State of North Carolina

Professional Engineer #24549, State of Maryland

Professional Engineer #54155, State of Florida

Professional Engineer #12314, State of Delaware

Professional Engineer #PE-055890-E, Pennsylvania Department of State

Professional Engineer #6733, State of Rhode Island

Professional Engineer #E-63467, State of Ohio

Professional Engineer #21258, State of Connecticut

Professional Engineer #8227, State of New Hampshire

Professional Engineer #7462, State of Maine

Professional Engineer #074002, State of New York

Professional Engineer #39528, Commonwealth of Massachusetts

Professional Engineer #018-0007111, State of Vermont

MEMBERSHIPS

Member, Society of Petrophysicists and Well Log Analysts

Member, American Council of Engineering Companies

PROJECT EXPERIENCE

BROWNFIELDS

Environmental Claims Support, Superfund Site | Utah

Mr. Gendron was Project Manager on the evaluation of an ore refining Superfund Site. Time critical cleanup options were evaluated and the selected alternatives consisted of: excavation, stabilization, and landfilling of process wastes; on-site stabilization and capping; and decommissioning of former process buildings.

Caldwell Trucking Superfund Site | New Jersey | 1992

Mr. Gendron was contracted to review a proposed scope of work prepared by the Army Corps of Engineers for the Caldwell Trucking Superfund Site. Industrial and municipal septage placed in unlined lagoons had contaminated several municipal wells. A plume nearly one mile long was identified in the geologic environment of overburden and bedrock. Stantec also completed a Remedial Alternatives Analysis, selected an alternate design, evaluated the cost of the Army Corps of Engineer's remedy and provided an engineering cost estimate for an alternative Remedial Design/Remedial Action.

TAG Advisor, Callahan Mine Superfund Site | Brooksville, Maine | 2004

Mr. Gendron is Project Manager for Peer Review and oversight of environmental restoration activities at the Callahan Mine Superfund Site as the EPA's TAG Advisor. After reviewing Maine DOT submittals, Mr. Gendron assimilates the comments from project team members and provides comments and recommendations in review memos to the Maine Environmental Research Institute (MERI). Mr. Gendron also represents MERI at meetings with the MEDEP, EPA Region I and their Oversight, MEDOT personnel, MEDOT Prime Contractors, and public groups. The large scope of the environmental restoration activities at the 150-acre Callahan Mine site (waste rock, acid rock drainage [ARD], tailings pile, surface water/sediment impacts, ecological impacts, and groundwater impacts, etc.) and the breadth of Remedial Alternatives have been an exciting challenge. As Project Manager for MERI, Mr. Gendron has been successful at strongly advocating their position without creating an adversarial atmosphere amongst team members.

Tolend Road Superfund Site | Dover, New Hampshire

Mr. Gendron was the project manager for the remedial design (RD) of the source control (SC) groundwater management remedy at the Tolend Road Superfund site in Dover, New Hampshire. The Pre-Design Investigation (PDI) is complete and included multi-level wells, pumping tests, soil/groundwater/surface water/sediment/air sampling, magnetometry, numerical modeling and a POTW discharge evaluation. Design activities are still in progress.

Redevelopment and Investigation and Remediation of CVOC and PCB Contaminated Aquifier | Confidential Client | Burlington, Massachusetts | 1995

A complex fractured bedrock aquifer was contaminated by CVOCs and PCB-contaminated oil at this industrial site. As part of the design processes, under the Massachusetts Contingency Plan (MCP), a Focused Feasibility Study was performed. A dual recovery system was implemented for removal of oil and a fractured bedrock trench system is used to capture contaminated groundwater. The groundwater is treated using diffused aeration. Mr. Gendron is responsible for design modifications, operation and maintenance of the treatment system and reporting for MADEP and NPDES review. Mr. Gendron served as project manager for the preparation of design plans and specifications for the treatment of 1,600 cubic yards of contaminated soils at this facility. The treatment consists of excavation, on-site asphalt encapsulation and re-use of treated soils on-site as a base for new parking areas/driveways. The plans were approved by the MADEP and remediation has been completed.

Brownfields Redevelopment, Heavy Metal Remediation | Swanton, Vermont

Mr. Gendron provided senior technical review for the preparation of a conceptual remedial action plan for the remediation of lead and mercury contaminated soil at a former ammunition plant in Swanton, Vermont. This site is part of a Brownfield initiative that the Town of Swanton is performing to reuse this facility and surrounding properties. Based on the results of the remedial investigation, the conceptual plan includes the excavation, relocation, and capping of the contaminated soil. After consolidation and capping of the contaminated soil, an access road will be built over the area to further limit exposure.

Permitting and Redevelopment of Former Wood Treating Facility | Confidential Client | Nashua, New Hampshire

Mr. Gendron served as project manager and lead designer for the redevelopment of a 90-acre wood treating complex. Key components of the project to date have included applying for and securing a Site-Specific Terrain Alteration Permit (TAP) and a Local Exceptions to the Zoning regulations for Flood Plain Dredging/Filling, completing design documents (Grading Plan, Cut/Fill Plan, Sedimentation/Erosion Control/Stormwater Management Plan), and overseeing the 5-month construction effort. A total of 250,000 cubic yards of soil were moved during the recontouring of the site. Approximately 40,000 cubic yards of impacted soil (creosote, PCP, CCA) were disposed in an on-site engineered landfill as part of the project. A key project goal of a balanced site (no on-site or off-site transport of fill) was achieved.

TAG Advisor, Loring Air Force Base Superfund Site | Limestone, Maine | 2002

Mr. Gendron's extensive background in investigation and remediation provided the necessary skills to be Project Manager for Peer Review and oversight of environmental restoration activities at Loring Air Force Base as the EPA's TAG Advisor for the former Loring Air Force Base in Limestone, Maine. After reviewing Air Force submittals, Mr. Gendron assimilates the comments from project team members and provides comments and recommendations in review memos to the Loring Development Authority. Mr. Gendron also represents the LDA at meetings with the MEDEP, EPA Region I and their Oversight, AF Closure personnel, AF Prime Contractors and public groups. Additionally, he serves as a board member of the Remediation Advisory Board that replaced the Technical Review Committee. The large scope of the environmental restoration activities at LAFB (petroleum spills, PCBs, landfills, etc.) and the breadth of Remedial Alternatives have been an exciting challenge. As Project Manager for the LDA, Mr. Gendron has been successful at strongly advocating their position without creating an adversarial atmosphere amongst team members.

CIVIL ENGINEERING

Major Big Box Retailer, Gasoline Service Station Design | Multiple Locations

Mr. Gendron has completed full design submittals for gasoline service stations as part of a company-wide program for a major big box retailer. Under this program, about 50 comprehensive design packages have been completed since 1998. Of those, 35 have received full Planning/Zoning Board approval and 31 stations have already been, or are in the process of being, constructed. The design package is turnkey and includes the complete underground UST system (tanks, piping, pumps, etc.), all above-ground components (gasoline dispensers, site grading, fueling islands, concrete pads, kiosk, etc.), and associated site work elements (parking, drainage, landscaping, etc.).

Regional Telephone Utility, Hydraulic Lift/Gas Trap Removal/Replacement | Brockton and New Bedford, Massachusetts

Mr. Gendron has completed hydraulic lift and gas trap removal/replacement designs for a utility provider in New England. Work included the acquisition of Planning/Zoning Board/Con Comm, Engineering, and Sewer Connection approvals of the Site Plan and other engineering drawings. Mr. Gendron was also responsible for handling impacted soil/groundwater encountered during the removals.

ENVIRONMENTAL LITIGATION, ARBITRATION AND MEDIATION SUPPORT

Expert Report for CIC v. The Home Insurance Company | Yellow Springs, Ohio

Provided expert report and deposition in connection with litigation associated with the recovery of remediation costs. Our report centered on the timing of groundwater impacts as a result of solvent releases from a manufacturing facility.

Expert Opinion for Lincoln Environmental v. Liberty Mutual Insurance Company | East Greenwich, Rhode Island

Provided expert opinion in connection with litigation associated with the recovery of remediation costs. Our opinion centered on the appropriateness of remediation activities conducted by Lincoln Environmental. Specific aspects of the opinion included site work elements, such as excavation, support, etc.

Litigation Support, Multiple Industrial Sites | New Jersey

The liability for contamination damages at eighteen industrial manufacturing sites was denied by ten national insurance carriers. Stantec was retained by the multi-national manufacturer to provide litigation support and expert testimony for the cost recovery action in this New Jersey Superior Court case. The case was settled in favor of our client.

Litigation Support, Industrial Landfill | Tyngsboro, Massachusetts

A private landfill site in Northern Massachusetts has been designated as an NPL site, and Federal and State lawsuits have been filed. A Stantec client had historically utilized the site, and accordingly, we have been asked to review all facility waste handling documents and interview employees to determine the character of the waste and the waste handling and transportation practices. Additionally, testimony has been required. Our client has been downgraded to a de minimis party and settled out favorably.

Litigation Support, Industrial Site | West Caldwell, New Jersey

A manufacturer was charged by Federal and State Agencies with contributing to the contamination (CVOCs) of a municipal supply well. Stantec was retained to review previous work, conduct additional investigations, provide state and federal regulatory interface services, design and install a remedial system, and provide testimony. Our work and testimony showed our client not to be contributing to the municipal supply contamination, and all municipal, state and federal claims were rescinded.

Expert Opinion, Residential Spill Site | Maine

Mr. Gendron prepared an Expert Report in connection with unregulated discharges from a leachfield. Impact evaluation included an assessment of potential impacts to a nearby farm and potential health effects.

Expert Testimony, Commercial Development Site | Greenfield, Massachusetts

Mr. Gendron provided expert testimony at trial in connection with the siting, design, and installation of a comprehensive fueling facility. Specific aspects of the testimony provided included environmental issues and site civil elements, such as lighting, noise, site layout, parking, etc.

Settlement Support, Commercial Spill Sites | Multiple Locations, New England and U.S. East

Mr. Gendron has provided expert support to counsel on the excessiveness or inappropriateness of actions taken by Insureds at a variety of spill locations in New England and the eastern US.

Litigation Support, Industrial Spill Site | Vermont

Mr. Gendron provided litigation support for a property owner as part of a lawsuit involving property damage due to past waste disposal activities on an adjacent property. Key site attributes include contamination associated with a leaking underground storage tank (free/dissolved phase) and DNAPL (CVOCs) from a leach field discharge.

Litigation Support, Drycleaner Site | Vermont

Mr. Gendron is currently working through counsel for an international insurance provider to defend the operator against unnecessary or excessive investigation/remediation costs. To date, multiple investigations targeted at delineating PCE (and other CVOCs) impacts have been completed and a Soil Vapor Extraction System remains operational.

Settlement Support, MGP Sites | Multiple Locations, Massachusetts

Mr. Gendron has been retained through counsel for a national insurance carrier to support the settlement of a multi-site environmental claim in connection with a number of former MGP sites. Thus far, Mr. Gendron has rendered a reasonableness Opinion and is in the process of evaluating appropriate Past and Future investigation/remediation costs.

Mediation Support, BTEX/MTBE Release Site | Valley Stream, New York

Mr. Gendron provides support to a Liquidation Firm responsible for settling policy claims associated with a gasoline release in Valley Stream, NY. Mr. Gendron provided an Expert Opinion on the appropriateness/reasonableness of investigation/remediation actions for an extended MTBE plume. Remedial actions included Soil Vapor Extraction. In situ strategies were also considered.

Expert Testimony, Commercial Development Site | South Attleboro, Massachusetts

Mr. Gendron provided expert testimony at trial in connection with the design and installation of a comprehensive fueling facility. Specific aspects of the testimony provided included environmental issues and site civil elements, such as lighting, noise, site layout, parking, etc.

Mediation Support, Multi-Media Investigation/Cleanup Site of BTEX/MTBE Impacts

Mr. Gendron provides Expert Support to an insurance company during mediation proceedings associated with the investigation and cleanup of a release site in North Carolina that purportedly threatened a public water supply well. Mr. Gendron provided support in the areas of contaminant fate and transport, excessive/unnecessary determinations, and future cleanup technologies for BTEX/MTBE impacts.

Expert Opinion, Kerosene Release, Commercial Property | Laconia, New Hampshire

Mr. Gendron provided Expert Support in connection with litigation at a kerosene spill site. Mr. Gendron has issued an Expert Opinion regarding the Cause/Origin/Timing of the oil release and the Adequacy of the Oil Supply line repair work.

Expert Opinions, Former Transformer Recycling Facility

Mr. Gendron prepared Expert Opinions on the Appropriateness/Reasonableness of Past and Future Investigation/Remediation costs and the Divisibility of Contamination for a national insurance company in connection with a claim against a utility. The utility had allegedly sold spent transformers to the facility and the "junking" of the transformers had apparently led to PCB impacts both on, and off, the site. The 20-year history of investigation/remediation actions at the site was reviewed and future cost estimates were found to be grossly overstated. Mr. Gendron also rendered an Expert Opinion regarding the Divisibility of Contamination that was based on the historical usage of the site and our interpretation of its contaminant fate and transport characteristics. A number of other responsible parties were identified as a result of our analysis.

Peer Review/Expert Testimony

Mr. Gendron is regularly retained by insurance, governmental, and private clients to perform peer review of investigative reports and associated recommendations. In addition, or as an adjunct to peer review, Mr. Gendron has provided litigation support on environmental insurance claims, civil (UST/AST) design, and hydrogeologic, hydrogeochemical, and environmental remediation issues. This support is preceded by a thorough review of documents and reports associated with the case under study. Among these projects are the following selected references:

ENVIRONMENTAL SITE REMEDIATION

Department of Public Works Garage | Newington, New Hampshire

A release of gasoline from a UST was identified in 1998. Stantec (formerly Jacques Whitford) was contracted to remove the tank and conduct the Site Investigation that was required by the NHDES. Subsurface investigations indicated a plume of methyl tert butyl ether (MTBE) extending more than 1000 feet downgradient. After reviewing remedial options, use of soil vapor extraction (SVE) was selected for the mitigation of the gasoline soils in the source area. Mr. Gendron designed and oversaw the construction of the SVE system. The SVE system was installed in late 2004, operated for several years. Based on O&M data from the SVE system and the continuing improvement in groundwater quality, the system was taken off-line in early-2006 with the approval of the NHDES. The system has been decommissioned.

UST/AST Program Management for the NHDOT | Multiple Locations, New Hampshire

Program Director for a Term Tank Management Contract for the NH Department of Transportation (NHDOT) responsible for fueling system design, tank replacements, tank upgrades, and compliance. Also responsible for construction inspection and oversight, spill assessment, and cleanup.

Hazardous Waste Closure Certification | Multiple Locations, Maine

Lead Engineer for Closure Certification at multiple facilities in Maine, including an electronic parts manufacturer and a Petroleum Bulk Storage Facility. Also responsible for spill assessment/cleanup and closure sampling.

Flood-Related Petroleum Release Cleanup | Ramapo River Area, New York

Lead Engineer for emergency response, site investigation, and closure actions at a Petroleum Bulk Storage Facility in New York. Surface water diversion, tank recovery, containment dewatering/treatment/discharge, and assessment activities are underway, with review by NYSDEC.

Confidential Client — In Situ Treatment of CVOC Plume | Earlysville, Virginia

Performed pilot test of a combined soil vapor extraction (SVE), air sparging, well recirculation strategy to address CVOC impacts. Based on pilot test improvements, system has now been expanded and put into full-scale implementation. CVOCs recovered by the SVE system from soil and water are discharged under an Air Permit exclusion.

LUST/Uncontrolled Hazardous Substance Sites RI/FS, MEDEP

Mr. Gendron is currently managing, or has completed remedial investigations/feasibility studies and design programs at, uncontrolled hazardous substance and petroleum contaminated sites for the State of Maine in the following towns:East Winthrop, ME, East Corinth, ME, South China, ME, East Pittston, ME, Brooks, ME, Waterboro (Waterboro Patent), ME, South Paris, ME, East Waterboro (S. Maine Finishing), ME

RI activities at these sites have included comprehensive field investigation programs, receptor evaluations, exposure assessments, and numerical risk assessments. FS activities have included detailed remedial technology analyses, and remedial alternative identification/evaluation. Selected remedies have included excavation/off S site disposal, soil vapor extraction, soil venting, dissolved phase recovery and free product recovery, natural attenuation, and bioremediation.

Mr. Gendron is the lead engineer for an RI/FS at an uncontrolled hazardous substance site in South Paris, Maine. This site consists of a large industrial landfill surrounded by a wetland area.

Petroleum Bulk Storage Facility Investigation and Remedial Action Plan Preparation | Staten Island, New York

Mr. Gendron provided Pre-Design Investigation and design engineering services at a 500-acre petroleum bulk storage facility on Staten Island. Soil gas survey, aquifer testing (single well, pumping test) and groundwater sampling were performed to delineate the occurrence of petroleum contamination. All work was conducted in accordance with NYSDEC regulations. The results of the Pre-Design Investigation were used to prepare a Conceptual Remediation Plan. The plan called for continued monitoring and passive product recovery through bailing. Since evaluation of hydraulic gradients, contaminant distribution, lack of sensitive environmental receptors and intended use of the property, it was concluded that active recovery was not required.

Industrial Site Remediation | New Jersey

Mr. Gendron was the lead designer/engineer for the remediation of a large industrial spill site in Edison, NJ. Remediation at the site addressed three areas of concern (AOCs): free product/dissolved phase petroleum contamination; petroleum/VOC contaminated soils; and an extensive plume of VOC contaminated groundwater. Key design components include: air stripping; filtration; vacuum-enhanced multi-well groundwater recovery; and soil vapor extraction. Mr. Gendron has also incorporated a state-of-the-art remote monitoring and control system into the design.

Site Investigations and Corrective Actions at Con Edison Service Centers | New York, New York

Mr. Gendron manages the Spill compliance program for all of Con Edison's Services Centers. Key initial responsibilities were developing a program work plan and quality assurance project plan, and negotiating its acceptance with the NYSDEC. Key tasks of the NYSDEC-approved Workplan included: background data review, multi-media site investigation, free product recovery, development of RBCA corrective actions, and report submittal. To date, four site investigations and corrective action plans have been completed.

RBCA Assessments/Implementation

Mr. Gendron has implemented cleanup actions at numerous contaminated sites using the RBCA process. These have included a number of release sites at: Utility Service Centers in New York City and New Hampshire; Bulk Storage Facilities and DPW garages in New Hampshire; and an industrial facility in Arkansas. At each of these locations, Mr. Gendron has completed receptor identifications, exposure assessments, and identified appropriate risk-based cleanup goals.

Con Edison Central Substation Transformer Fields | New York, New York

Mr. Gendron manages multi-media (soil, groundwater, surface water) investigations at several Con Edison's Central Substation Transformer Fields (CSs) and provides senior technical review for all CS investigations. To date, 32 CSs have been investigated for the presence of PCBs, heavy metals, VOCs and SVOCs. Sampling of water (surface water outfalls, etc.) was performed in accordance with SPDES requirements. Of the 32 CSs, about 16 have displayed some level of PCB contamination in the soil and/or groundwater. Elevated lead concentrations have also been noted. Phase II PCB investigations are on-going at two of the CSs and PCB-contaminated soil/water has been removed and disposed of off-site at a number of other CSs.

PCB Site Assessment and Cleanup

Mr. Gendron has developed significant experience with investigation and cleanup of PCB contaminated sites. His experience includes: preparation of sampling and analysis plans, and quality assurance project plans; negotiation of cleanup criteria; preparation of excavation, treatment and disposal plans; compliance with SPDES Permits, and remedial oversight. His responsibilities at these sites have consisted of both Project Management and Senior Technical Review. He has worked on several projects in New York State and Massachusetts involving soil/water PCB contamination. He has also designed dual phase collection and treatment systems for sites with PCB-contaminated water.

Comprehensive Site Assessment | New London, Connecticut

Mr. Gendron served as Senior Engineer on a Comprehensive Site Assessment of a commercial property suspected of having been environmentally degraded as a result of upgradient petroleum releases. The investigation included soil borings, bedrock coring, well installation, and media sampling. We concluded that there were no environmental liabilities for our client at this property.

Environmental Claims Support | Midwestern U.S.

Mr. Gendron managed a detailed past and future cost evaluation for a claim associated with a major chemical manufacturer in the Midwestern United States. Areas of Concern addressed included a lake edge embankment reinforcement, a hazardous waste landfill closure, capping and closure of historic settling ponds, and containment of groundwater migration to river surface water. Through the screening process, numerous costs associated with facility demolition and closure were successfully disallowed.

Environmental Claims Support | New Jersey

Mr. Gendron managed a cost evaluation of proposed Corrective Actions at 40 plus sites with heavy metal soil and ground water contamination. This analysis included the procurement of competitive bids and costing procedures, and a regulatory evaluation of the proposed remediation in the context of revised State cleanup standards.

Environmental Claims Support | Midwestern U.S.

Mr. Gendron managed a technical and cost evaluation for an environmental impairment claim associated with a large chemical manufacturing facility in the Mid western United States. Issues evaluated from a technical and cost basis included dioxin contaminated soil, landfill closure and containment, lagoon dewatering and sediment removal, containment of identified areas of concern, river sediment and surface water contamination, and ongoing O&M of existing treatment systems.

RCRA Corrective Action Site | Vermont

Mr. Gendron served as Project Manager for the investigation and closure of a former RCRA facility. The facility produced a heavy metal-laden waste as a by-product of its operation, some of which was discharged to an on-site leachfield structure. The leachfield structure and associated impacted materials were removed and the site was successfully closed. Mr. Gendron is currently providing litigation support for a property owner as part of a law suit involving property damage due to past waste disposal activities on an adjacent property. Key attributes of the adjacent site include impacts associated with a leaking UST (free/dissolved phase) and DNAPL from a floor drain/leach field discharge.

Environmental Claims Support, RCRA Corrective Action Site | Louisiana

Mr. Gendron served as Project Manager/Lead Engineer on the evaluation of the RCRA Corrective Actions at a major petroleum refinery/chemical plant complex in Louisiana. Our analysis targeted the corrective actions associated with soil/groundwater/surface water impacts from over 30 SWMUs. As a result of the analysis, a multi-faceted corrective action was proposed consisting of groundwater pump/treat, product recovery, and monitoring.

RCRA Closure and Redevelopment of Industrial Facility | Whitinsville, Massachusetts

Mr. Gendron designed the sampling and quality assurance protocol to investigate spills from PCB transformers at an industrial facility in Whitinsville, MA. Literally hundreds of PCB-containing transformer pads and switching gear locations had to be evaluated. A plan is currently being prepared for the remediation of PCB spills in accordance with the MA MCP and Federal TSCA regulations. The transfer of ownership of this major manufacturer of printing equipment in Whitinsville, MA precipitated an extensive study of soil, groundwater and surface water. Through extensive sediment sampling and analysis of the adjacent river and historical records search of up-river industries, we were able to conclusively show that heavy metal contamination was not caused by our client. Stantec performed groundwater sampling and chemical analyses of monitoring wells, as well as evaluation of the environmental status of the facility buildings. Soil was removed and sent to a landfill for disposal. A groundwater and free product recovery system was designed, installed and operated. In addition, Stantec provided oversight and management of the removal of hazardous materials and waste, and building clean-up that sup-ported the RCRA closure of the facility.

Meadowbrook Springs | Malone, New York

Mr. Gendron provides Senior Technical Review and Principal Engineering on a hydrogeological investigation to characterize the source of a potential spring water site. Characterization work is on-going and future activities will include nation-wide permitting.

Environmental Claims Support, RCRA Corrective Action Site | Oklahoma

Mr. Gendron was Project Manager on the evaluation of a RCRA corrective action program at a major petroleum refining facility in Louisiana. Activities included a 200+-acre free product system, and soil/groundwater/sediment/surface water impacts. Recommended corrective measures consisted of free product recovery, groundwater pump and treat, installation of a river revetment system, and monitoring.

Environmental Claims Support, MGP Sites | Midwestern U.S.

Mr. Gendron evaluated and provided an alternate remedial strategy for four (4) manufactured gas plant (MGP) sites in the Mid-Western United States. The sites evaluated under this claim included utility properties which had been used for gas production for the mid-1880s until the 1950s. Several of the sites had been transferred to municipalities and are currently being used for recreational purposes and schools. The evaluation included extensive review of available data and the development of a remedial strategy for addressing shallow and deep soils, fractured bedrock with free product present, groundwater, and surface water and sediment. The selected remedies included risk-based closure for several of the sites, with consideration provided to the current usage of the properties.

Regional Insurance Carrier - Environmental Response Vendor Audit | Eastern U.S.

Mr. Gendron managed and completed an audit of their regional emergency response vendor. Tasks completed included Regulatory interviews, vendor quote solicitation, and past cost analysis. Based on the results of the analysis, several basic changes to the way emergency response services are currently being provided were recommended to this carrier.

Gasoline Release Sites | New Rochelle and Pelham Manor, New York

Mr. Gendron provided senior engineering and Permit Support for a High Vacuum Extraction System and a Soil Vapor Extraction (SVE) System at LUST sites in New Rochelle and Pelham Manor, NY. The systems are fully operational and permitted.

National Insurance Carrier - Claims Support and Fuel Release Cause/Origin and Third Party Impact Opinions

Mr. Gendron serves as program manager for claims support and cause/origin and TPI investigations for several national insurance carriers. This work is completed in connection with sudden releases of petroleum at trucking spill sites, commercial facilities, and homeowner locations. To date, he has completed over 100 investigations at fuel release sites across New England and the eastern US. Field tasks include detailed site inspections and soil/groundwater sampling for the purposes of TPI assessments. In some cases, if requested by the Insured and authorized by the insurance companies, he has also completed the on-the-ground environmental investigations/remediation services. For our cause/origin and TPI investigations/opinions, he has developed and used an automated reporting tool that was supported, in part, by our in-house AST/UST design experts.

Gas Station Release Sites | North Carolina

Mr. Gendron provided senior engineering for, and sealed, Corrective Action Plans (CAPs) for several gasoline LUST sites in NC. Corrective Actions included monitored natural attenuation (MNA), soil vapor extraction (SVE), and groundwater pump and treat.

Petroleum Bulk Storage Facilities, Industrial Landfills, LUST Sites - Groundwater Management Permit Acquisition and Management | New Hampshire

Project Manager and Lead Engineer on the application for, and acquisition of, Groundwater Management Permits (GMPs) at ten Petroleum Bulk Storage Facilities, Industrial Landfills, and LUST Sites in New Hampshire. Also responsible for monitoring and reporting at all of these locations.

NHDES ODD Fund Projects | New Hampshire

Mr. Gendron has been project manager or project director on over 15 ODD Fund sites. He currently manages the ODD Fund investigations/cleanups at the following locations: Department of Public Works (DPW) Garage, Dover, NH; Two ODD Fund cases at a bulk storage facility in Dover, NH; Gas Station in North Hampton, NH; and Maintenance Garage at a NYNEX Facility, Greenland, NH.

The soil removal remedy has been implemented at the DPW garage, and we have closed one of the two cases at the bulk storage facility and are implementing the remedial action at the other. The closure at the bulk storage facility involved a risk-based closure. We are implementing the requirements of Groundwater Management Permits at the remaining locations.

Investigations/Cleanup at Oil/Hazardous Material Sites for the NHDOT | Multiple Locations, New Hampshire

Program Director for continuous Term Hazardous Materials Services Contract for the NHDOT since 1997. Responsible for preliminary and detailed site assessments; exposure assessments, risk characterization and management; remedial actions; and closures. Services include design sampling programs, evaluating remedial technologies, and selecting risk-based corrective actions at NHDOT hazardous spill sites in accordance with Hazardous Waste Regulations and TSCA. Also manages the handling and disposal of oil or hazardous materials encountered during construction projects in NHDOT Rights of Way.

Gas Station | Nottingham, New Hampshire

Mr. Gendron evaluated remedial options and selected ozone injection as the preferred alternative. The final ozone injection design specifications have been submitted to the NHDES for approval. Monitoring continues at the Site as the ozone injection option is being considered.

Department of Public Works Garage | Newington, New Hampshire

Mr. Gendron designed and oversaw the construction of the SVE system. The SVE system was installed in late 2004, operated for several years. Based on O&M data from the SVE system and the continuing improvement in groundwater quality, the system was taken off-line in early-2006 with the approval of the NHDES. The system has been decommissioned.

Former Department of Public Works Garage | Dover, New Hampshire

Subsurface investigations at this property indicated several areas of impacted soil and groundwater due to the former use of USTs at the site. Following the completion of a RAP for the property, soil excavation with off-site disposal was selected as the remedial option of choice to address identified soil impacts in two areas. Ultimately, nearly 2000 tons of gasoline-impacted soil was removed from the two areas, one of which was located adjacent to the tidal Cocheco River and required permits from the New Hampshire Wetland Bureau. The soil was disposed off-site at a thermal treatment facility.

Defense Fuel Supply Center, Groundwater Remediation (PAH and BTEX) | Mattawamkeag, Maine | 1993

Water quality sampling results at a pipeline pump station had indicated contamination of the groundwater by petroleum hydrocarbons and BTEX compounds. Responsible for designing a product recovery and groundwater extraction and treatment system. The design was based on data obtained through on-site pilot studies consisting of aquifer pumping tests and a small scale aeration study. Prior to designing the system, a Remedial Alternative Analysis was performed with regard to extraction technique and treatment processes. The design consisted of fractured bedrock trenches, dual extraction and groundwater treatment. The groundwater treatment system consisted of iron pretreatment, filtration, aeration and carbon adsorption. The treated water was to be discharged to the subsurface through an infiltration system.

Maritime Energy, Soil and Groundwater Remediation, LUST Site | Belmont, Maine

Designed and implemented the remediation plan for a commercial site where both soil and groundwater was contaminated by gasoline. The groundwater recovery and treatment system design consists of a 26-foot deep, 180-foot long interceptor trench and sump. The recovered groundwater is pumped from the sump to a treatment system incorporating aeration and car-bon absorption. The final design also includes in-situ and ex-situ vapor extraction.

UV Oxidation | Shreveport, Louisiana

Mr. Gendron performed pilot and bench scale treatability studies for removal of inorganic/organic compounds for a pre-treatment process. Based on the results of the treatability study a pretreatment system was designed and implemented.

Mr. Gendron was responsible for operation and maintenance, designing any improvements to the system, and reporting all results to the LDEQ. Currently, Mr. Gendron performed a supplemental remedial investigation at the site. The field work included GPR, monitoring well installation, soil and water sampling, and surveying. The additional information will be used to design an automated DNAPL recovery system and improve capture of the contaminant plume.

Petroleum and Hazardous (CVOCs, etc.) Waste Remediation | New England, New Jersey, New York

Mr. Gendron has consistently designed low maintenance, highly reliable systems. To this end, several of his designs incorporate state-of-the-art on-site microprocessor based control systems. Communication with these systems is via telephone lines which allows for real-time access to and modification of system operation from our office. The systems automatically adjust system operation in response to various sensory inputs (i.e., flow meters, pressure transducers, etc.). The remote access capabilities and automated nature of the systems decrease the need for costly on-site maintenance visits and yield optimized, reliable, and cost-effective remediation systems.

Mr. Gendron is currently responsible for maintaining and optimizing the following spill clean-up remedies and treatment systems: A groundwater recovery and treatment system in Madbury, NH; A groundwater recovery and treatment system associated with a LUST site in Hampton, NH, which discharges under a NPDES – RGP authorization; A groundwater recovery/treatment system with Permanganate injection in West Caldwell, NJ; A combined free product/dissolved phase recovery and treatment system in Newark, NJ; A single well recovery system in Fairfield, NJ; A groundwater recovery/treatment system with Modified Fenton's injection in E. Orange, NJ; A groundwater recovery/treatment system for a VOC plume at a RCRA site in Earlysville, VA.

Petroleum and Hazardous (CVOCs, etc.) Waste Remediation | New England, New Jersey, New York

Mr. Gendron has managed and completed the design on numerous hazardous waste and petroleum remediation systems. These include:
A horizontal well/product recovery system for a utility in Danvers, MA; A soil vapor extraction (SVE) system associated with MTBE contamination in Newington, NH; In situ applications of ORC at a LUST site in East Orange, NJ and Newark, NJ; A bioventing system for a major utility in Lancaster, NH; A groundwater recovery and treatment system in response to a VOC plume for a State Agency in Hampton, NH; A dual vapor/groundwater recovery and treatment system for a VOC and petroleum contamination site in Middlesex County, NJ; Modified Fenton's and Permanganate applications at VOC plume sites in West Caldwell and East Orange, NJ; A combined free product/gw recovery and treatment system for a LUST site in Landing, NJ.

He was also lead designer/engineer on the following groundwater recovery and treatment systems: A multi-level groundwater recovery/treatment system in East Pittston, ME; A 0.1 MGD groundwater recovery and treatment system in Madbury, NH; A groundwater recovery and treatment system in West Caldwell, NJ.

Primary groundwater and vapor treatment methodologies at these sites included: air stripping (diffused aeration and countercurrent packed tower); catalytic oxidation; and carbon adsorption.

Pretreatment methodologies included: Sedimentation,Automated oxygen feed systems, pH modification, Ion exchange, Antifoaming agents, and Bag Filtration.

Numerical Modeling

Mr. Gendron has been extensively involved in groundwater modeling and simulation of groundwater flow and contaminant transport as part of detailed hydrogeologic studies and remedial designs. Both two- and three-dimensional modeling (MOC, MODFLOW, MODPATH, MT3D) have been accomplished at the following sites: Automobile Shredder Residue Pile; Madbury, NH; Industrial Facility; Shreveport, LA; Large Residential Development; Bartlett, NH; Industrial Facility; West Caldwell, NJ; Large Residential Development; Conway, NH; Industrial Facility; Standish, ME; Proposed Mine Site; West Forks, ME; Municipal Landfill Site; Conway, NH.

Mr. Gendron has extensive background in geophysical investigations and has employed these techniques at a number of sites in the eastern U.S. - primarily downhole geophysical logging, surface refraction, resistivity, metal detector, and electromagnetic conductivity techniques. He has applied each technique during water supply investigations and has developed involved geophysical programs which utilize several geophysical techniques (e.g. seismic refraction, electromagnetism, and ground penetrating radar) to handle the more complex industrial site remedial investigations.

Industrial Site RI/FS | Various Locations

Mr. Gendron has been responsible for a variety of active and inactive industrial remedial investigations and feasibility studies where a detailed program of background data collection; non-invasive studies (soil gas, geophysics); well installation; and aquifer and soil evaluation has been involved. Many of these sites involved the investigation and remediation of solvent (CVOCs) releases. Feasibility studies have included such tasks as ARAR definition, remedial technology screening, and remedial alternative development/evaluation. Mr. Gendron has been responsible for the technical oversight, manpower allocation, and cost accounting throughout the projects.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLANS

Maine Department of Environmental Protection, SPCC Program Design

Mr. Gendron was part of a team that developed a comprehensive SPCC program for the Maine Department of Environmental Protection. The program follows the new Federal requirements. Included in this program was Community Outreach Sessions, Training Programs, and informational Seminars.

SPCC Plan Reviews | Multiple Locations

Mr. Gendron has completed reviews of SPCC Plans at multiple locations, including: petroleum bulk storage facilities in NH and ME; chemical facilities in the Midwest; utility locations across the eastern US; and oil storage facilities in MA and NY.

STORAGE TANK MANAGEMENT

Multiple Fueling Facility Locations, UST Replacement/Modification Program, NHDOT | NHDOT

Principal-in-Charge for a State-Wide Tank Management Program since 2006. That Program included +/- 100 fuel distribution facilities. Activities have included compliance evaluations, tank top upgrades, new fueling facility design and construction support, and overall programmatic support.

Multiple Telephone Utility Locations, UST Replacement/Modifications Program | Massachusetts, Maine, New Hampshire, Rhode Island

Lead Engineer for an approximate 100-tank replacement/modification program for a major telephone utility.

Donald Moore PG

Hydrogeologist

31 years of experience · Auburn, New Hampshire

Donald is a registered professional hydrogeologist with nearly 30 years' experience in hydrogeology and water resource studies. He has worked for both private and municipal clients on water supply and groundwater contamination projects, including aquifer mapping, water supply vs. demand evaluations, plume migration investigations, and numerous geological and geotechnical investigations.

His responsibilities include project management, aquifer testing and analysis, groundwater flow and contaminant transport evaluation, hydrogeological data analysis, and report preparation. Donald has overseen regular quality sampling projects at dozens of municipal and private sites throughout New England, and has been involved in several statewide landfill site searches in Maine and countywide searches in New Hampshire and Vermont. Other experience includes: field geological and hydrogeological investigations, drilling supervision and sampling of groundwater monitoring and water supply wells, and responsibility for health and safety on field projects. Donald is a Professional Geologist (P.G.) registered in the State of New Hampshire.

EDUCATION

Master of Science, Hydrology, University of New Hampshire, Durham, New Hampshire, 1992

Bachelor of Science, Natural Resource Economics, University of New Hampshire, Durham, New Hampshire, 1982

40-Hour OSHA Health and Safety Training, Portsmouth, New Hampshire, 1992

OSHA Yearly Refresher Course, Auburn, New Hampshire, 2015

REGISTRATIONS

Professional Geologist #726, State of New Hampshire

MEMBERSHIPS

Member, National Ground Water Association

PROJECT EXPERIENCE

ENVIRONMENTAL SITE ASSESSMENTS PHASE I, II, III

Phase I Environmental Site Assessments

Project hydrogeologist for Phase I site assessments throughout New England. Responsibilities include reviews of existing background data, site surveys, subsurface investigations and report preparations.

ENVIRONMENTAL SITE REMEDIATION

Remedial Investigation and Action | 2012–Present

Project Manager and Project Hydrogeologist for projects involving contaminated soils and groundwater at commercial properties in New York and New Jersey. Investigation activities include soil borings, soil and sediment sampling, well installation, and sampling of groundwater and surface water to delineate horizontal and vertical extent of contamination. Developed conceptual site models and remediation actions.

Hazardous Waste and Petroleum/RI/FS/O&M | 2015–Present

Mr. Moore's hydrogeologic background and experience has resulted in effective technical management of oil and gasoline contaminated sites. He has worked on a variety of large scale industrial and residential sites from the investigatory to the preliminary remedial design phases. He has directed the clean-up of contaminated soils, removal of underground fuel tanks and the installation of monitoring and recovery wells on LUST sites throughout New England.

SOLID WASTE

Various Landfills | Massachusetts | 2010–Present

Project Manager responsible for groundwater and leachate monitoring and reporting for groundwater management permit compliance for private solid waste company.

Wolfeboro Camp School | Wolfeboro, New Hampshire

Project Manager responsible for groundwater monitoring and reporting for groundwater management permit compliance.

Storyland Amusement Park | Glen, New Hampshire

Project Manager responsible for groundwater monitoring and reporting for groundwater management permit compliance.

Knox County Regional Airport | Owls Head, Maine | 2010–Present

Project Manager responsible for groundwater monitoring and reporting for groundwater management permit compliance.

South Berwick Landfill | South Berwick, Maine

Project Manager responsible for groundwater monitoring and reporting for groundwater management permit compliance.

Somersworth Ash/Sludge Landfill | Somersworth, New Hampshire | 2000–Present

Project Manager responsible for groundwater monitoring and reporting for groundwater management permit compliance. Recent work includes groundwater evaluation for PFAS contamination.

Madison Landfill | Madison, New Hampshire | 2000–Present

Project Manager responsible for groundwater sampling, landfill gas monitoring, and reporting for groundwater management permit compliance.

Newbury Landfill | Newbury, New Hampshire | 2000–Present

Project Manager responsible for groundwater monitoring and reporting for groundwater management permit compliance. Recent work includes groundwater evaluation for PFAS contamination.

Ossipee Landfill | Ossipee, New Hampshire | 2000–Present

Project Manager responsible for groundwater sampling, landfill gas monitoring, and reporting for groundwater management permit compliance. Recent work includes groundwater evaluation for PFAS contamination.

Newmarket Landfill | Newmarket, New Hampshire

Project Manager responsible for groundwater sampling, landfill gas monitoring, and reporting for groundwater management permit compliance.

Durham Landfill | Durham, New Hampshire | 2000–Present

Project Manager responsible for groundwater sampling, landfill gas monitoring, and reporting for groundwater management permit compliance. Recent work includes groundwater evaluation for PFAS contamination.

Claremont Landfill | Claremont, New Hampshire

Project Manager responsible for groundwater sampling, landfill gas monitoring, and reporting for groundwater management permit compliance.

Proposed Landfill Site | Canterbury, New Hampshire | Project Hydrogeologist

Conducted site assessment at a potential landfill site. Completed boring and monitoring well installation, permeability tests, data analysis, groundwater contour maps, and prepared report for landfill permitting.

Massachusetts Landfills | Marshfield, Townsend, Massachusetts | Project Hydrogeologist

Conducted comprehensive site assessment at existing landfill in accordance with MA DEP regulations. Completed boring and monitoring well installation, permeability tests, data analysis, groundwater contour maps, and prepared report for landfill permitting. In addition to hydrogeologic investigations, non-invasive techniques involving seismic refraction surveys and electromagnetromery were performed.

New Hampshire Landfills | Wolfeboro, Glen, Somersworth, Madison, Newbury, Ossipee, Newmarket, Durham, Claremont, New Hampshire | Project Manager

Project Manager responsible for groundwater monitoring and reporting for groundwater management permit compliance.

Rutland Regional Planning Commission, Landfill Siting | Rutland County, Vermont

As field manager for this countywide solid waste site search, Mr. Moore provided oversight for activities including water quality sampling and hydraulic testing. This search involved the initial review of approximately 10 sites which were then narrowed to two sites, one in Shrewsbury and the other in Mt. Holy, Vermont. Boring and monitoring well installation in addition to double-ring infiltrometry were used for the hydrogeological investigations. Cross-sections were prepared detailing the complex hydrogeology of the site. Stantec is currently awaiting a response from the county on the recommendations.

Mr. Moore also was field manager for comprehensive site assessments of landfills in Townsend and Marshfield, Massachusetts and Canterbury, New Hampshire. In addition to hydrogeologic investigations, non-invasive techniques involving seismic refraction surveys and electromagnetrometry were performed.

Windham Solid Waste Management District, Landfill Siting | Windham County, Vermont

Mr. Moore served as field manager for a countywide solid waste site search in Windham County. He provided oversight for activities including boring and monitoring well installation, water quality sampling and hydraulic testing. In the search of the 21 initial options, Stantec located two sites in Dummerston which met the predetermined criteria. These sites underwent preliminary subsurface investigation and one site was chosen for the state-of-the-art landfill facility. Stantec prepared cross-sections for the site describing the complex hydrogeology encountered.

WATER SUPPLY

Meadowbrook Springs Malone | Meadowbrook Springs Malone, New York

Oversaw the drilling of test wells and the installation of piezometers in several natural springs. Conducted and analyzed pumping test data for the determination of aquifer characteristics, safe yield, and the connection between the well site and the springs. Based on the physical and chemical connection, site has been deemed a viable spring water source.

Route 44 Well Site | Middleborough, Massachusetts | 1995–Present

Project Manager and project hydrogeologist for the evaluation of potential municipal well site located between two streams. Responsibilities included locating observation wells between production well site and streams, installing piezometers and staff gauges in wetlands and streams, and conducting a long term constant rate pumping test. Significant analysis on the interaction between the well site and the two streams was conducted. Results describing the physical and chemical characteristics of the site indicated the well has the potential for 0.75 mgd.

Mizaras Well Site | Middleborough, Massachusetts | 1995–Present

Project Manager for the investigation of a Town owned site adjacent to the Taunton River for potential municipal water supply. Oversaw boring and observation well installation, wetland and river piezometers installation, conducted and analyzed aquifer pumping tests to derive aquifer safe yield, zones of contribution, and influence on the river on the pumping well. Well site has the potential for 1 mgd.

Water Supply Development | Bow, New Hampshire | 2000–Present | Manager and Field Hydrologist

Project Manager and Field Hydrologist responsible for overseeing production well construction, sustained pumping test and water quality sampling, and hydrogeological interpretation. Detailed evaluation on the inter-relationship between the aquifer and the Merrimack River was undertaken. Additional responsibilities included preparation of final report and permitting in accordance with NHDES regulations pertaining to Large Production Wells For Community Water Systems.

Water Supply Development | City of Keene | Keene, New Hampshire

Participated in the hydrogeological study of the Lower Basin aquifer, which was identified by others as a potentially high yielding resource. Mr. Moore managed the test well drilling and related aquifer data analysis. Results from this project were presented in GIS format compatible to the City's database.

Spring Water Resource Evaluation | Confidential Client | Southeast, New Hampshire

Project manager and Field Hydrogeologist for the evaluation of a potential spring water resource for a private landowner. Work included observation well installation and testing. Preliminary results indicated a non-viable resource, project terminated prior to undo expenses incurred by client.

Water Resource Investigation | Town of Middleborough | Middleborough, Massachusetts

Project Manager for the investigation of additional groundwater reserves to be incorporated into the municipal water supply. Oversaw boring and test well installation and development, conducted and analyzed aquifer pumping tests to derive aquifer safe yields and zones of contribution.

Water Resource Evaluations | New Hampshire, Maine, New York

Project manager on investigations of sand and gravel aquifers proximal to natural springs. The purpose of these investigations was to evaluate, develop, and protect the groundwater resources for a potential private water company. Responsibilities included observation well installation and sustained pumping tests to evaluate the interaction between the aquifer and spring water sources. Development of each site is ongoing.

Water Resource Evaluation | Confidential Client | Southeast, Maine | 2005–Present

Project Manager/Field Hydrogeologist for the evaluation and development of groundwater resources from a sand and gravel aquifer for a private water company. Work included overseeing test well drilling and sustained pumping test. Data analysis and interpretation were focused on the interaction between the aquifer and nearby surface water springs. Development of the site is ongoing.

Water Supply Exploration and Development | Lisbon, Maine

Project Manger and Field Hydrogeologist retained by the Town of Lisbon to locate, construct, and test a replacement well for one of the Town's aging sand and gravel wells. Issues pertaining to this replacement well included extensive development and known contaminant sources within the aquifer and the interconnection to a nearby river.

Water Supply Development | Brunswick-Topsham, Maine

As project manager, Mr. Moore oversaw the installation of numerous test wells throughout the Jackson-Taylor sand and gravel aquifer. The results of which identified locations for large diameter test wells and constant rate aquifer pumping tests. Results were also utilized in a numerical model that defined the aquifer boundaries and 200-day and 2500-day Time of Travel boundaries. Replacement wells for two existing production wells were designed and permitted, and scheduled for installation in 2004. Total yield of the well field will likely be well in excess of seven million gallons per day.

Additional work included evaluating the condition of an existing production well screen. Work entailed videotaping the condition of the screen and re-developing the well. Results showed a small volume of sand entering the screen at on specific location. This well was subsequently abandoned and replaced.

Elizabeth Crowley

Chemist / Health and Safety / Project Scientist

37 years of experience · Denver, Colorado

Ms. Crowley has over 20 years of professional experience in the environmental consulting field. This experience has included responsibility for the management of company health and safety, environmental compliance, and security, as well as the related issues and responsibilities involved as a chemist and process engineer. Ms. Crowley has experience in emergency response, health and safety oversight, data validation, verification and evaluation, auditing, and training. Her project work includes commercial, industrial, governmental, petroleum and energy clients. She has a broad range of industrial experience including process safety engineering, wastewater treatment operations, risk assessment, and industrial hygiene.

EDUCATION

BA, Chemistry, University of Northern Colorado, Greeley, Colorado, USA, 1983

PROJECT EXPERIENCE

ASSESSMENT, PERMITTING AND COMPLIANCE

HS-SER – QAPP Generation/Superfund Data Validation | UTC | Rockford, Illinois, United States | 2008-2010 | QA Chemist/Data Validator

Beth generated site Quality Assurance Plan and Level III and IV data validation of all exploration, clean-up and monitoring samples. Aqueous, solid, and air sample results were validated for volatile organic compounds, semi-volatile organic compounds, metals, and additional organic and inorganic parameters. She validated the data in accordance with Superfund EPA and state validation guidelines. She generated data validation checklists and modified EDDs with validation flags and changes. Role: QA Chemist/Data Validator | Dates involved: 2008-2010

Dixon River Data Validation | ComEd | Dixon, Illinois | 2009-2009 | Chemist/Data Validator

Level III data validation of all clean-up samples. Aqueous, solid and air sample results were validated for volatile organic compounds, semi-volatile organic compounds, metals and additional organic and inorganic parameters. Validated the data in accordance with EPA and state validation guidelines. Generated data validation checklists.

Purity Oil Superfund Site Data Validation | Chevron | Fresno, California, United States | 2000-2009 | Chemist/Data Validator

This project involved the Level III and IV data validation of all sampling events over nine years. Aqueous, solid, and air sample results were validated for volatile organic compounds, semi-volatile organic compounds, metals, pesticides, herbicides, PCBs and additional organic and inorganic parameters. She validated data in accordance with Superfund, EPA, and state validation guidelines. She generated data validation checklists, annual summaries, and usability reports for the events. Role: Chemist/Data Validator | Dates involved: 2000-2009

Winross Environmental Compliance* | Winross | Rochester, New York | 1990–1995 | Environmental, Health and Safety Director

Director for a manufacturing company for environmental compliance and engineering responsibilities for a variety of programs and areas for 150 employees located at nine separate facilities. Responsible for all permits, filing, reports, and in-house activities for local, state, and federal requirements as related to environmental issues. Responsible for health and safety, including the generation of hazard communications, RTK, respiratory protection, ergonomics, hazardous waste, emergency response, first aid, personnel protective equipment, and health and safety training programs. Conducted industrial hygiene monitoring and loss prevention studies, and OSHA recordkeeping and report filing. Additional duties encompassing security issues; for fire, burglary, and access control, direction, programming, and company training.

Chevron Purity Oil Sales Superfund Site, Site Characterization, Groundwater Monitoring, Remediation, and Site Closure Reporting | Malaga, California | 2008-2017 | Data Validation

This project involved the decommission and clean-up an old refinery. Role: Data Validation | Cost: Unknown | Dates involved: 2008-2017

UTC – HS-SER | 2008-2013 | Data Validation

This project involved the decommission, clean-up and decontaminate a manufacturing facility. Role: Data Validation | Cost: Unknown | Dates involved: 2008-2013

GSA Fed Center | 1993-Ongoing | Data Validation

This project consisted of a clean-up of a UST release. Role: Data Validation | Cost: Unknown | Dates involved: 1993-Ongoing

** denotes projects completed with other firms*

CHEMICALS & POLYMERS

Emulsitone Materials Testing and Management* | Intel | Whippany, New Jersey | 1987-1990 | Chief Chemist

Served as Chief Chemist for a specialty chemical manufacturing company in New Jersey responsible for batch processing of specialty formulations for use in semiconductor manufacturing, scheduling of materials/shipping and receiving, quality control analysis, office and technical staff supervision and scheduling, and new products development and documentation procedures. Performed procedural testing of materials, including gas chromatography, viscosity, atomic absorption, standard wet chemistry methods, and electrical and diffusion characteristics for various film and thin-layer substances.

ENVIRONMENTAL ASSESSMENTS

BP Gas Plant/Compressor Station Hazardous Materials Assessment | Ulysses, Kansas | Sampling and H&S Oversight

Responsible for the assessment of the quantity and location of hazardous materials at an inactive gas plant and compressor station in December 2008. Supervised and directed a sampling team, documented the locations and estimated quantity of all materials and the proper sampling of materials. Completed the required custody documents and recordkeeping documents. Provided training and evaluation per BP parameters.

BP MC252 Emergency Response | Hopedale, Louisiana | Health and Safety Officer

As the Base Night Operations Safety Officer and member of the Rapid Response Environmental Site Support Team (RRESST), performed Health and Safety oversight of the Hopedale, Louisiana base of operations. Duties included daily on shore facility inspections, reporting and recordkeeping, H&S management of scheduled and unscheduled operations and incidents in accordance with the BP MC252 Emergency Response Plan. I interacted and assisted sub-contractor personnel, government representatives, the media and the public on various occasions and activities from July 2010 through September 2010.

Amtrak PCB Data Validation | Amtrak | Wilmington, Delaware, United States | 1998–2009 | Chemist/Data Validator

This project involved the data validation of volatile organic compounds, semi-volatile organic compounds, metals, PCBs, and PCB congeners. Beth validated Level III and IV data in accordance with EPA and state validation guidelines and generated reports and usability summaries. Role: Chemist/Data Validator | Dates involved: 1998-2009

Blue Island Data Validation | ComEd | Blue Island, Illinois | 2009-2010 | Chemist/Data Validation

Level III and IV data validation of over 275 data packages. Validated aqueous, solid and air sample results for volatile organic compounds, semi-volatile organic compounds, metals and additional organic and inorganic parameters. Validated the data in accordance with EPA and state validation guidelines. Generated data validation checklists.

Amtrak | 1997-2017 | Data Validation

The goal of this project was to evaluate railroad tracks, terminals and facilities for PCBs, initiate clean-up and evaluate progress. Role: Data Validation | Cost: Unknown | Dates involved: 1997-2017

HAZARDOUS WASTE

Hawthorne – Battery Recycling | US Navy | Hawthorne, Nevada | 2003-2005 | Chemist / Health and Safety Officer

Conducted industrial hygiene monitoring and hazardous substance risk assessment for a battery recycling facility. Provided process modification in ventilation system, hazardous chemical monitoring system, materials handling, wastewater treatment and modified H&S procedures and recordkeeping for the facility.

OIL & GAS

Chevron–Dutch Harbor Pipeline Removal | Chevron | Dutch Harbor, Alaska, United States | 2008-2010 | Data Validation

Beth performed Level III and IV data validation of all organic and inorganic data for soil and water samples. She generated summary reports for data quality and assisted with QAPP and SAP generation. She also provided onsite H and S oversight, inspections, and reporting. She was involved with onsite wastewater treatment engineering and testing. Role: Chemist/Health and Safety Officer | Dates involved: 2006-2008

Pyramid Lake Pipeline Release | Pacific Energy | LA County, California | 2004-2007 | Emergency Response, H&S Oversight, QAPP/SAP Preparation, Data Validation

First-responder to site of initial emergency release. Set up site H&S program. Acted as incident commander for 24 hours. Provided communication and coordination with multiple government agencies. Evaluated sampling needs. Oversaw H&S of cleanup operations. Validated data for all samples; prepared data quality reports and final request for NFA on site.

RESEARCH / LABORATORIES

Tempress* | General Signal | Santa Clara, California | 1983-1987 | Process Engineer

Involved in the research and development of LTO, LPCVD, Diffusion, and Atmospheric Furnace systems for semiconductor production. Included international on-site customer evaluations related to increasing production yields within existing frameworks and/or implementation of new procedures. Provided debugging and testing of new equipment, and analysis of chemical and physical properties of the deposited films.

** denotes projects completed with other firms*

Denver Federal Center - Materials Laboratory Spill Cleanup Project | General Services Administration | Denver, Colorado, United States | 2003-2008 | Project Manager

Beth performed Level IV data validation of all organic and inorganic data for soil, water, and air samples and generated summary reports for data quality. She also assisted with QAPP and SAP generation and performed health and safety inspections and reporting. Role: Project Manager | Cost: Unknown | Dates involved: 2003-2008

APPENDIX D

Health and Safety Plan

HEALTH AND SAFETY PLAN

STANTEC CONSULTING SERVICES, INC.

PROJECT IDENTIFICATION

Project Name:	*Belle Harbor RI*
Job site Address:	*112-115 Beach Channel Drive, Far Rockaway, Queens, NY*
Stantec Project Number:	*191710624/191711713*
Client:	*The Stop & Shop Supermarket Company*
Date Prepared:	*10/1/2024*
Date of Work Start-Up:	2025
Duration On-site:	15 days

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APPENDICES

HEALTH AND SAFETY PLAN

STANTEC CONSULTING SERVICES, INC.

1.0 INTRODUCTION

This Health and Safety Plan (HASP) establishes guidelines and requirements for safety of personnel during the conduct field activities associated with the scope of work to be implemented on the Site. All employees of Stantec Consulting Services, Inc. (Stantec) involved in field activities associated with this project are required to abide by and adopt the provisions of this HASP. They are required to read the HASP and sign the attached acknowledgement sheet prior to initiating work.

The health and safety guidelines and requirements presented herein are based on a review of available information along with an evaluation of potential hazards. This HASP outlines the health and safety procedures and monitoring equipment required for tasks performed at this site to minimize the potential for exposure to hazardous situations by field personnel.

All personnel involved in field activities must have completed the 40-hour hazardous waste training program (including Hazard Communication [HazCom] training) and respirator fit testing as specified by the Occupational Safety and Health Administration (OSHA) regulations codified at 29 CFR 1920.120 – Hazardous Waste Operations and 29 CFR 1910.134. Additionally, all annual 8-hour updates must be completed and documented. Those personnel acting as site supervisors shall have also completed the one-time 8-hour supervisor training program. Stantec Health & Safety Officer or Project Manager will review all workers' paperwork prior to the start of work. Certifications for Stantec personnel are provided in Appendix B of this HASP.

All Stantec site workers shall be regularly monitored as part of corporate medical surveillance program. Subcontractors must comply with an equivalent program.

All Stantec personnel shall sign and adhere to this HASP. Stantec subcontractors (to include sub-consultants and designated vendors) have the responsibility of implementing health and safety plans and precautions for their employees based on health hazard information provided by Stantec, the Client, and other available sources. Subcontractor plans and precautions can not conflict with the plans and precautions of Stantec, the Client, or other parties at the work location. Any such conflicts must be resolved before work is initiated. Stantec will document all training sessions and site safety (Daily Toolbox or Last Minute Risk Assessment) meetings or talks for this project.

ABBREVIATIONS

The following abbreviations will be used throughout the remainder of this Environmental, Health and Safety Plan:

PPE -	Personal Protection Equipment	LEL -	Lower Explosive Limit
PVC-	Polyvinyl Chloride	SSO -	Site Safety Officer
SCBA -	Self-contained Breathing Apparatus	EZ -	Exclusion Zone
APR -	Air Purifying Respirator	MSDS -	Material Safety Data Sheet
PEL -	Permissible Exposure Limit	STEL -	Short Term Exposure Limit
TLV -	Threshold Limit Value	PPM -	Parts Per Million

2.0 SITE INFORMATION

2.1 Site Description

The subject property is approximately 5 acres in size located at 112-15 Beach Channel Drive, Queens (Far Rockaway), New York. The site currently consists of a shopping center building of approximately 57,000 square feet with tenant retail commercial operations. The remaining approximate 3.7 acres of the site is paved. The property is bordered by Beach Channel Drive running parallel to the northern boundary, a Mobil gasoline station in the north corner boundary to the subject property, and Wainwright Court/Rockaway Freeway to the east. An electrical substation and former Manufactured Gas Plant (MGP) property is immediately to the east of the subject property across Wainwright Court. The New York City Subway Yard tracks are located to the south separated from the property by a chain-linked fence. The Subway Yard appears to be at a lower elevation of approximately two to three feet below the grade of the subject property. A Post Office and retail stores are located to the northwest abutting the parking area of the subject property. A New York City Department of Transportation parking lot is located to the west.

The subject property is relatively flat with a very gentle very slope toward the south. The property is reported to be approximately 10 feet above mean sea level and within the Atlantic Coast Plain with a report two to four feet of fill beneath pavement and buildings.

2.2 Site History

There appears to be three distinct releases of oil and hazardous materials at the site: 1) the release of dry cleaning solvent in the area of existing monitoring well MW-4 located near center of the subject property; 2) the presence of residual hazardous materials apparently from the former operations of the MGP located east of the subject property; and 3) the potential co-mingling of petroleum hydrocarbons with other contaminants identified in groundwater at the subject property likely resulting from a release of unknown origin, volume and time period from one or more of the operating gasoline stations and/or auto repair shops located adjacent to the northeast or nearby to the north boundary of the subject property. Environmental media investigated to-date include soil, groundwater, soil vapor and indoor ambient air within existing buildings. There are no wetlands or areas of surface water on or adjacent to the property. The nearest surface water is a marine bay (Jamaica Bay) located approximately 300 feet to the north. There are no tanks, storage facilities, waste water treatment or other significant waste handling systems on the property. There is storm drainage system which will be evaluated and mapped. Historic fill material is known to be present at the site at a depth of 0-2 or 0-4 four feet below grade depending on the site location.

2.3 Scope of Work

Of one (1) soil vapor sampling point (replacement for GEI point ID SV-103). Following the vapor point installation, groundwater samples will be collected for laboratory analysis using low-flow methods. Concurrent with the groundwater sampling, soil vapor and ambient air samples will be collected for laboratory analysis using Summa canisters.

Task Description	Invasive? (Y/N)	Protection Level	Code 53 Information
1) Soil Boring, Monitoring Well, and Soil Vapor Point Installation	Y	D	Code 53 #: TBD Clear: TBD
2) Soil Sampling	N	D	N/A
3) Groundwater Sampling	N	D	N/A
4) Soil Vapor/Ambient Air Sampling	N	D	N/A

2.4 Site Access

If the Client is not the Site Owner or if access to the Site property is achieved by crossing other properties, work cannot be initiated without having an access agreement in writing in the file before work on site is initiated. The following information must be provided.

Check here if not required: (X)

ACCESS AGREEMENT FROM PROPERTY OWNER	ON-FILE IN WRITING (Yes/No)
Owner Name and Date:	

3.0 PERSONNEL AND RESPONSIBILITIES

Name	Firm	Project Responsibilities	On-Site by Task
Craig Gendron	Stantec	PC Management Lead	( )1 ( )2 ( )3 ( )4 ( )5 (x)No
Alex DeNadai	Stantec	NY P.E., Technical Review	( )1 ( )2 ( )3 ( )4 ( )5 (x)No
Don Moore	Stantec	H&S Advisor	(x)1 (x)2 (x)3 (x)4 ( )5 ( )No
Don Moore	Stantec	Project Manager	(x)1 (x)2 (x)3 (x)4 ( )5 ( )No
Jennifer Nair	Stantec	Environmental Scientist	(x)1 (x)2 (x)3 (x)4 ( )5 ( )No
Jason Ward	Stantec	Environmental Technician	(x)1 (x)2 (x)3 (x)4 ( )5 ( )No
TBD	*Subcontractor*	Driller	(x)1 ( )2 ( )3 ( )4 ( )5 ( )No
TBD	*Subcontractor*	Utility Markouts	( )1 ( )2 ( )3 ( )4 ( )5 ( )No
TBD	Subcontractor	Surveyor	( )1 ( )2 ( )3 ( )4 ( )5 ( )No
	Subcontractor	Remediation	( )1 ( )2 ( )3 ( )4 ( )5 ( )No
	Subcontractor	Consultant	( )1 ( )2 ( )3 ( )4 ( )5 ( )No
	Subcontractor	Geophysical Survey Team	( )1 ( )2 ( )3 ( )4 ( )5 ( )No
	Subcontractor	General or Utility Contractor	( )1 ( )2 ( )3 ( )4 ( )5 ( )No

Field personnel listed on this page have completed the training, medical, and respiratory program of the Stantec Environmental Health and Safety Program and OSHA standard 29 CFR 1910.120, as applicable.

Stantec will perform observation of the field activities and will perform health and safety monitoring, during the activities indicated in Section 2.3.

Stantec's subcontractors include: To Be Determined

The contractors will perform the following activities for this project: *Not Applicable*

4.0 HAZARD ASSESSMENT SUMMARY

This section identifies the hazards expected at this specific site.

4.1 Physical Hazards

(x) Slips, Trips & Falls
(x) Noise
( ) Temperature
( ) Electrical (Hazardous Energy)
( ) Pinch Points
(x) Other (specify): Traffic, heavy equipment
( ) N/A

4.2 Chemical Hazards

The MSDSs for the chemicals and products indicated below are provided in Appendix C. It is not anticipated that any other chemicals or products will be used during the investigation.

4.2.1 Sample Preservation Chemicals

Expected types of sample preservation (check as many as applicable)

(x) HCl – hydrochloric acid (x) HNO_3 – nitric acid ( ) H_2SO_4 – sulfuric acid
( ) NaOH – sodium hydroxide ( ) $Na_2S_2O_3$ – sodium bisulfate (x) CH_3OH - methanol
( ) Other (specify):______
( ) N/A

4.2.2 Calibration Gases

(x) isobutylene
( ) other (specify):______

4.2.3 Types of Waste

Expected physical state of waste (check as many as applicable)

(x) Liquid (x) Solid ( ) Sludge (x) Gas ( ) Unknown
( ) Other (specify)______
( ) N/A

Expected waste characteristics (check as many as applicable)

( ) Corrosive (x) Toxic ( ) Inert ( ) Flammable (x) Volatile
( ) Reactive ( ) Radioactive ( ) Unknown ( ) Other (specify):______

4.2.4 Types of Chemicals or Contaminants

Expected Chemicals or Contaminants (check as many as applicable, **excluding those indicated above**)

Miscellaneous	Solids	Sludges	Solvents	Oils
( ) Acids	( ) Fly Ash/Bottom Ash	( ) Paint Pigments	(x) Halogenated Solvents	(x) Oily Wastes
( ) Pickling	( ) Asbestos	( ) Metals Sludge	( ) Non-Halogenated Solvents	( ) Other (specify): ____________
( ) Liquors	( ) Milling/Mine Tailings	( ) POTW Sludge	( ) Other (specify):___________	
( ) Caustics	( ) Ferrous Smelter	( ) Aluminum		
( ) Pesticides	( ) Non-Ferrous Smelter	( ) Other (specify): ______________		
( ) Dyes/Inks	( ) Other (specify): ________________			
( ) Cyanides				
( ) Phenols				
( ) Halogens				
( ) Flammable Liquids				
( ) Flammable Solids				
( ) Phthalates				
( ) PCBs				
(x) Metals				
( ) Explosives (UXO)				
( ) Other (specify):_______________				
( ) N/A				

Other Chemicals or Contaminants:
( ) Laboratory
( ) Pharmaceutical
( ) Hospital
( ) Radiological
( ) Municipal
( ) Other (specify):___________________________

4.3 Biological

( ) N/A
( ) Bacteria (specify type):_______________
( ) Fungi (specify type):_________________
( ) Viruses (specify type):________________

(x) Insects (specify type): ticks, bees, mosquitoes, black flies
( ) Wildlife (specify type):________________
( ) Flora (specify type):___________
( ) Other (specify):_____________________

4.4 Ergonomic

(x) Position
( ) Lighting
( ) Heavy Lifting
( ) Repetitive motion
( ) Other (specify):____________________________
( ) N/A

4.5 Environmental

<u>Weather conditions, geographic location</u>
(x) Heat Stress (see attached guidelines)
(x) Cold Stress (see attached guidelines)
( ) Oxygen Deficient Atmosphere
( ) Hazardous Atmosphere
( ) Radiological

TABLE OF CHEMICALS AND SAFETY DATA

Chemical	PEL/REL/STEL	HEALTH HAZARDS
Tetrachloroethylene	PEL = 100 ppm REL = carcinogenic	Irritates eyes, skin, upper respiratory system; causes dizziness, drowsiness, and liver damage; carcinorgenic
Trichloroethylene	PEL = 100 ppm REL = carcinogenic	Irritates eyes and skin; causes headaches, dizziness, nausea and vomiting; carcinogenic
Vinyl Chloride	PEL = 1ppm REL = carcinogenic	Causes abdominal pain, gastrointestinal bleeding, and enlarged liver; carcinogenic
Polynuclear Aromatic Hydrocarbons (naphthalene, anthracene, pyrene, chrysene, etc.)	PEL = 0.2 mg/m^3	Dermatitis, bronchitis, carcinogenic
Hydrochloric Acid	PEL = 5 ppm (ceiling) REL = 5 ppm (ceiling)	Irritates nose, throat; causes coughing, choking, eye and skin burns
Methanol	PEL = 200 ppm REL = 200 ppm	Irritates eyes, skin, upper respiratory system; causes dizziness, nausea, headaches, and visual disturbance
Isobutylene	PEL = None established	Inhalation causes rapid breathing, dizziness, fatigue, nausea, and asphyxiation
Standard Action Level will be 10% of PEL (*e.g.*, AL for xylenes is 10 ppm).		
PEL = OSHA Permissible Exposure Limit REL = NIOSH Recommended Exposure Limit STEL = OSHA Short Term Exposure Limit		

5.0 OVERALL HAZARD RATING

Task	Description	Ranking*
1	Soil Boring Drilling and Monitoring Well/Soil Vapor Point Installation	( ) Extreme ( ) High ( ) Moderate (x) Low ( ) Unknown
2	Soil Sampling	( ) Extreme ( ) High ( ) Moderate (x) Low ( ) Unknown
3	Groundwater Sampling	( ) Extreme ( ) High ( ) Moderate (x) Low ( ) Unknown
4	Soil Vapor/Ambient Air Sampling	( ) Extreme ( ) High ( ) Moderate (x) Low ( ) Unknown

Protection Level Determination:

Ranking	Protection Level
Extreme or High	Exposure hazard justifies level A or B PPE
Moderate	Exposure hazard justifies Level C PPE
Low	Exposure hazard justifies Level D PPE
Unknown	Knowledge of existing hazards insufficient to determine proper level of protection. Use most conservative PPE (A or B) until more thorough site reconnaissance completed

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Task 1: ***Soil Boring Drilling and Monitoring Well/Soil Vapor Point Installation***

Protection Level: ( ) A ( ) B ( ) C (x) D ( ) Modified

Check required elements:

Required?	Respiratory: (x) Not Required*		Required?	Protective Clothing: ( ) Not Required		Required?	Boots:	
	Type	Specify make/model		Type	Specify make/model		Type	Specify make/model
	SCBA, Airline			Encapsulated Suit		X	Steel Toed	
	APR*			Splash Suit			Sole puncture protection	
	Cartridge			Apron			Electrical Resist.	
	Escape Mask			Tyvek Coverall			Static Dissipative	
	Other			Saranex Coverall			Chainsaw prot.	
				Cold weather gear			Other	
			X	Safety Vest				
				Other				

Check required elements:

Required?	Head, Eye & Ear:		Required?	Hands:	
	Type	Specify make/model		Type	Specify make/model
X	Hard Hat			Undergloves	
X	Safety Glasses		X	Gloves	nitrile
	Face Shield			Overgloves	
	Goggles			Other	
X	Ear Plugs				
	Ear Muffs				
	Other				

* If excessive dust is observed during excavation in the breathing zone, then PPE shall be upgraded to*: purifying respirators with combination organic vapor/P100 particulate cartridges*. If persistent PID readings in the breathing zone exceed 1 ppm above background for 5 minutes, the workers will remove themselves from the source area or orient their position to upwind of the source area. After 2 minutes they may reenter the work area checking the PID for background levels. If workers cannot find a location where background levels can be attained, they will stop work and contact PM/ H&S advisor.

The Personal Protective Equipment indicated above will conform to 29 CFR 1910 requirements.

Task 2: ***Soil Sampling***

Protection Level: ( ) A ( ) B ( ) C (x) D ( ) Modified

Check required elements:

Require d?	Respiratory: (x) Not Required*		Require d?	Protective Clothing: ( ) Not Required		Require d?	Boots:	
	Type	Specify make/model		Type	Specify make/model		Type	Specify make/model
	SCBA, Airline			Encapsulated Suit		X	Steel Toed	
	APR*			Splash Suit			Sole puncture protection	
	Cartridge			Apron			Electrical Resist.	
	Escape Mask			Tyvek Coverall			Static Dissipative	
	Other			Saranex Coverall			Chainsaw prot.	
				Cold weather gear			Other	
			X	Safety Vest				
				Other				

Check required elements:

Required?	Head, Eye & Ear:		Required?	Hands:	
	Type	Specify make/model		Type	Specify make/model
	Hard Hat			Undergloves	
X	Safety Glasses		X	Gloves	nitrile
	Face Shield			Overgloves	
	Goggles			Other	
	Ear Plugs				
	Ear Muffs				
	Other				

* If excessive dust is observed during excavation in the breathing zone, then PPE shall be upgraded to*: purifying respirators with combination organic vapor/P100 particulate cartridges*. If persistent PID readings in the breathing zone exceed 1 ppm above background for 5 minutes, the workers will remove themselves from the source area or orient their position to upwind of the source area. After 2 minutes they may reenter the work area checking the PID for background levels. If workers cannot find a location where background levels can be attained, they will stop work and contact PM/ H&S advisor.

The Personal Protective Equipment indicated above will conform to 29 CFR 1910 requirements.

Task 3: ***Groundwater Sampling***

Protection Level: ( ) A ( ) B ( ) C (x) D ( ) Modified

Check required elements:

Required?	Respiratory: (x) Not Required*		Required?	Protective Clothing: ( ) Not Required		Required?	Boots:	
	Type	Specify make/model		Type	Specify make/model		Type	Specify make/model
	SCBA, Airline			Encapsulated Suit		X	Steel Toed	
	APR*			Splash Suit			Sole puncture protection	
	Cartridge			Apron			Electrical Resist.	
	Escape Mask			Tyvek Coverall			Static Dissipative	
	Other			Saranex Coverall			Chainsaw prot.	
				Cold weather gear			Other	
			X	Safety Vest				
				Other				

Check required elements:

Required?	Head, Eye & Ear:		Required?	Hands:	
	Type	Specify make/model		Type	Specify make/model
	Hard Hat			Undergloves	
X	Safety Glasses		X	Gloves	nitrile
	Face Shield			Overgloves	
	Goggles			Other	
	Ear Plugs				
	Ear Muffs				
	Other				

* If excessive dust is observed during excavation in the breathing zone, then PPE shall be upgraded to*: purifying respirators with combination organic vapor/P100 particulate cartridges*. If persistent PID readings in the breathing zone exceed 1 ppm above background for 5 minutes, the workers will remove themselves from the source area or orient their position to upwind of the source area. After 2 minutes they may reenter the work area checking the PID for background levels. If workers cannot find a location where background levels can be attained, they will stop work and contact PM/ H&S advisor.

The Personal Protective Equipment indicated above will conform to 29 CFR 1910 requirements.

Task 4: ***Soil Vapor/Ambient Air Sampling***

Protection Level: ( ) A ( ) B ( ) C (x) D ( ) Modified

Check required elements:

Required?	Respiratory: (x) Not Required*		Required?	Protective Clothing: ( ) Not Required		Required?	Boots:	
	Type	Specify make/model		Type	Specify make/model		Type	Specify make/model
	SCBA, Airline			Encapsulated Suit		X	Steel Toed	
	APR*			Splash Suit			Sole puncture protection	
	Cartridge			Apron			Electrical Resist.	
	Escape Mask			Tyvek Coverall			Static Dissipative	
	Other			Saranex Coverall			Chainsaw prot.	
				Cold weather gear			Other	
			X	Safety Vest				
				Other				

Check required elements:

Require	Head, Eye & Ear:		Require	Hands:	
	Type	Specify make/model		Type	Specify make/model
X	Hard Hat			Undergloves	
X	Safety Glasses		X	Gloves	nitrile
	Face Shield			Overgloves	
	Goggles			Other	
	Ear Plugs				
	Ear Muffs				
	Other				

* If excessive dust is observed during excavation in the breathing zone, then PPE shall be upgraded to*: purifying respirators with combination organic vapor/P100 particulate cartridges*. If persistent PID readings in the breathing zone exceed 1 ppm above background for 5 minutes, the workers will remove themselves from the source area or orient their position to upwind of the source area. After 2 minutes they may reenter the work area checking the PID for background levels. If workers cannot find a location where background levels can be attained, they will stop work and contact PM/ H&S advisor.

The Personal Protective Equipment indicated above will conform to 29 CFR 1910 requirements.

7.0 MONITORING EQUIPMENT

Specify monitoring equipment required by task. Indicate type as necessary. Attach additional sheets, if necessary.

7.1 Photoionization Detector (PID)

INSTRUMENT	TASK	ACTION LEVELS	
Photoionization Detector	(x) 1 (x) 2 (x) 3 (x) 4 ( ) 5	Parameter: *Total Volatile Organics*	
Type: *Thermo 580B*	( ) Not needed	PPE Level	At Concentration
( ) 11.7 eV lamp		D	Background - 5.0 ppm
(x) 10.6 eV lamp		C	5.0 ppm to 50 ppm above background
( ) 10.2 eV lamp		B	50 - 500 ppm above background

COMMENTS:

All Stantec field personnel are trained and experienced in the calibration and proper use of the PID that will be used at the site. The PID will be calibrated at the start of each work day on-site using 100 ppm isobutylene standard gas. Calibration results will be recorded in the field book. The PID is factory calibrated on an annual basis.

The SSO or other site personnel will notify the Project Manager when concentrations approach action levels. Action levels must be sustained for 15 minutes at the breathing zone to justify implementing specific PPE. The Project Manager will evaluate and implement engineering controls, administrative controls, or changes in PPE to mitigate respiratory hazards.

7.2 Flame-Ionization Detector (FID)

INSTRUMENT	TASK	ACTION LEVELS	
Flame Ionization Detector	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5	Parameter: Total Volatile Organics	
Type: *Make/Model*	(X) Not needed	PPE Level	At Concentration
		D	Background - 5.0 ppm
		C	5.0 ppm to 50 ppm above background
		B	50 - 500 ppm above background

COMMENTS:

7.3 Detector Tubes

INSTRUMENT	TASK	ACTION LEVELS			
Detector Tubes	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5	Contaminant	TLV	STEL	Tube Type
Type: *Draeger*	(X) Not needed				

COMMENTS:

7.4 Combustible Gas Meter

INSTRUMENT	TASK	ACTION LEVELS	
Combustible Gas Indicator	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 (X) Not needed	0-10% LEL	No explosion hazard.
		10-25% LEL	Potential explosion hazard; notify SSO.
Type: LEL/O2		>25% LEL	Explosion hazard; interrupt task/evacuate.
		21.0% O_2	Oxygen normal.
		<21.0% O_2	Oxygen deficient; notify SSO.
		<19.5% O_2	Interrupt task/evacuate.

COMMENTS:

7.5 4 Gas Landfill Gas Meter

INSTRUMENT	TASK	ACTION LEVELS
4 Gas Landfill Gas Meter	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5	
Type: *Make/Model* Gem 2000	(X) Not needed	

COMMENTS:

8.0 DECONTAMINATION PROCEDURES

8.1 Personnel Decontamination Procedures

( ) Not applicable

Level C

* Wash overboots and overgloves with detergent (i.e., Alconox) solution.
* Rinse with potable water.
* Remove tape from overboots and wrists.
* Remove overboots, overgloves, and coverall.
* Discard all into secure drum; label and place drum in the on-site cargo container.
* Remove respirator.
* Remove undergloves and discard into secure drum; label and place drum in the on-site cargo container.
* Wash face and hands with soap and water.

Non-expendable reusable equipment (i.e., outer gloves, boots, and hard-hats) will be thoroughly washed at the decontamination location. Decontamination will consist of: scrubbing contaminated gloves and boots with an Alconox (or equivalent) detergent followed by a water rinse. Equipment will either be allowed to drip dry or be wiped off with paper towels, which will be collected, in secure drums. The drums will be labeled and staged in an area designated by Client pending characterization.

Level D

- Wash face and hands with soap and water.

Respirator Decontamination and Cleaning : Please refer to Stantec Respiratory Protection Program

8.2 Equipment Decontamination

Sampling Equipment

Required for: (x) Task 1 (x) Task 2 (x) Task 3 ( ) Task 4 *(If none checked, this subsection is not applicable)*

All sampling equipment will be decontaminated between each sampling location using the following procedures:

* Wear clean nitrile gloves (and outer gloves if task-required).
* Dissemble equipment and place component parts on polyethylene sheeting.
* Clean all component parts with detergent solution (i.e., Alconox or equivalent) using a brush to clean inside and outside surfaces.
* Rinse surfaces with potable water.
* Rinse surfaces with PFAS-free water
* Allow all components to air dry.
* Reassemble equipment.

Containment and Disposal Method (Sampling Equipment)

Required for: (x) Task 1 (x) Task 2 (x) Task 3 ( ) Task *(If none checked, this subsection is not applicable)*

Materials will be containerized (solids & water separately) and marked with a permanent marker indicating the site, date, and medium (solid or water). Containerized materials will be stored until characterized by Stantec and disposed of by the Client. The decontamination area will be lined with polyethylene sheeting to capture any and all steam-cleaning fluids.

Drilling & Augering Equipment

Required for: (x) Task 1 ( ) Task 2 ( ) Task 3 ( ) Task 4 *(If none checked, this subsection is not applicable)*

Drilling equipment (i.e. augers, cutting shoe, AW rods, etc.) will be steam cleaned to remove gross contamination. Drilling rig equipment (split-spoons) will be decontaminated with detergent and potable water solution and rinsed with potable water.

Containment and Disposal Method (Drilling Equipment)

Required for: ( ) Task 1 ( ) Task 2 ( ) Task 3 ( ) Task 4 *(If none checked, this subsection is not applicable)*

Drilling tools will be decontaminated in a 55-gallon DOT-approved steel drum that is placed within a sheet plastic lined containment area. The rear of the drilling rig will be steam cleaned by parking the drill rig over the containment area. Any fluids that are retained by the plastic lined containment area will be pumped into a 55-gallon drum.

9.0 SITE CONTROL

Site workers should minimize contact of personnel, visitors, general public, and equipment with contaminated or potentially contaminated materials. Selected controls indicated in subsequent subsections are indicated on Figure 1 in Appendix A. The SSO will ensure that these precautions are in-place before work begins each day.

9.1 Engineering Controls

( ) None Required

Indicate all that apply:

Engineering Controls	Description
(x)	Potable water spray to reduce asphalt dust from drilling.
( )	
( )	

9.2 Administrative Controls

(x) None Required

Check all that apply:

Administrative Controls	Description
( ) Exclusion zone	
( ) Decontamination zone	
( ) Support zone	
( ) Other: Reposition / Excavation	
( ) Other:	
( ) Other:	

9.3 Physical Controls

( ) None Required

Check all that apply:

Physical Controls	Description
( ) Barriers/fencing	
( ) Caution tape	
( ) Signs	
(x) Cones	**Around drilling/sampling locations**
( ) Other:	
( ) Other:	

10.0 EMERGENCY PROCEDURES

All Stantec personnel are considered by the local office Medical Monitoring Program. Please contact the H&S Officer for a copy of the Program (see contact list in Section 10.7).

10.1 Personnel Exposure

In the event of chemical exposure to known site contaminants, the MSDS or chemical data sheet, if available, should be consulted first. General practice exposure emergency actions include:

Inhalation Exposure - The following actions should be taken based on the condition of the effected employee.

* If symptoms are present (dizziness, nausea, headache, shortness of breath, burning sensation in mouth, throat, or lungs), the victim should be escorted from the work zone immediately.

* If unconscious, the victim should be removed from the work zone immediately. Rescuers must be wearing proper respiratory and protective equipment before attempting the rescue.

* If the victim is no longer breathing, cardiopulmonary resuscitation (CPR) or some other form of artificial respiration should begin immediately and medical support personnel notified.

Skin Exposure - The skin should be thoroughly washed with copious amounts of soap and water. If clothing is contaminated, it should be removed immediately and the skin washed thoroughly with running water. All contaminated parts of the body, including the hair, should be thoroughly decontaminated. It may be necessary to wash repeatedly.

Ingestion Exposure - Medical support should be obtained immediately.

Eye Exposure- If a toxicant should get into the eyes, flush with generous amounts of water. Washing should be continued for at least fifteen minutes and medical attention should be obtained if deemed necessary by the SSO or Alternate.

10.2 Personnel Injury or Medical Emergency

The following contingency plan will be enacted in the event of personnel injuries.

1. **Initial alarm and first aid**. Upon observation of an injury, quickly get attention of other nearby workers. Immediately act to protect the injured person from a life-threatening situation. Render appropriate first aid. Warn unsuspecting persons of the potential hazard.
2. Notify SSO of the situation. Identify the injured person, the type of injury and the project site location.
3. Ambulance and hospital services. The SSO or other appropriate personnel will immediately assess the situation and, if necessary, notify the designated ambulance service and hospital of the emergency situation.
4. Begin incident notification and reporting procedures.

10.3 Fire or Explosion

Upon notification of a fire or explosion on site, the designated emergency signal shall be sounded and all site personnel assembled at the designated access points. The Fire Department shall be alerted and all personnel moved to a safe distance from the involved area. Personnel in the immediate vicinity of a fire shall use fire extinguishers or other immediately available means if this can be done safely and the fire can be immediately controlled or stopped from spreading, but should not attempt to fight major fires or fires involving potential explosives.

The potential for chemical or fuel ignition, fire or explosion shall be assessed and precautions will be developed prior to initiation of the work in the hazard area. The local fire department must be notified for these hazards

10.4 Spills

In the event of a liquid/solid spill:

1. **First aid will be administered to injured/contaminated persons.** Any person observing a spill will act immediately to safely remove and protect injured/contaminated persons from any life-threatening situation. First aid and decontamination procedures will be implemented as appropriate by the SSO or approved on-site personnel.

2. **Warn unsuspecting persons/vehicles of the hazard.** All personnel will act to prevent any unsuspecting persons from coming in contact with spilled materials by alerting other nearby persons and by obtaining assistance of other personnel who are familiar with spill control and clean-up techniques.

3. **Stop the spill at the source, if possible.** Without taking unnecessary risks, personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum, closing a valve or temporarily sealing a hole with a plug.

4. **Notify the Program Manager/Project Manager.** Utilizing available personal radio communications or other rapid communication procedures, the Stantec Project Manager will be notified of the spill, including information on material spilled, quantity, personnel injuries and immediate life-threatening hazards.
5. **Notify Client**. The on-site Stantec representative will immediately notify the client on-site representative, if any, of any spill or release that occurs during the site investigation. The client will be responsible for reporting of spills to appropriate State or Federal agencies.

6. Begin notification and reporting procedures.

10.5 Evacuation Procedures

If at any time, the entire project site needs to be evacuated, the following procedures are to be carried out immediately:

1. The SSO will initiate the site evacuation.

2. The SSO will instruct that the evacuation signal be given. This signal will consist of verbal command or two (or more) sets of three air horn or car horn blasts.

3. All personnel will immediately halt work and proceed off-site to an adequate meeting area.

4. Unless otherwise directed, all site personnel will report to this location or other staging area.

Following an emergency situation, the SSO will begin notification and reporting procedures.

10.6 Emergency Equipment

Emergency equipment (**other than PPE already indicated previously**) that will be available at the Site includes:

Check all that apply:

Level D Equipment		Level C Equipment (in addition to Level D)	
	Hard Hat		Full face APR
	Nitrile gloves		Appropriate cartridges
	Standard tyvek suit		Respirator disinfectant
	Safety glasses or goggles		Other:
	Ear plugs/muffs		
x	First aid kit		
x	Eyewash kit		
	Fire extinguisher – Type:		
	Air horn		
	Other:		

10.7 Emergency Contacts

CONTACT	NAME	PHONE NUMBER	LOCATION
Stantec Project Manager	Don Moore	Cell: 603-498-3244	Auburn, NH
Stantec PC Management Lead	Craig Gendron	Cell: 603-498-0226	Auburn, NH
Stantec H&S Officer	Don Moore	Cell: 603-498-3244	Auburn, NH
Client Contact	Stop & Shop Contact: Ron Ruth	Phone: (617) 646-2165	Boston, MA
Client H&S Officer/Contact	NA		
Fire Department	New York City Fire Department	911	Far Rockaway, NY
Police or Sheriff's Department	New York City Police Department	911	Far Rockaway, NY
Poison Control Center		(800) 682-9211	
State Hazmat Emergency Agency	New York City Fire Department	911	Far Rockaway, NY
State Environmental Agency	NYDEC	(718) 482-7366	Long Island City, NY
National Response Center		800-424-8802	Washington, D.C.
USEPA Environmental Response Team		201-321-6660	
Association of American Railroads Response Team		202-293-4048	
US Coast Guard Environmental Response Team		800-424-8802	
CHEMTREC		800-424-9300	

10.8 Medical Emergency

Hospital Name: Peninsula Hospital Center

Hospital Address: 51-15 Beach Channel Drive, Far Rockaway, New York 11691

Hospital Telephone #: 718-734-2000

Name of Contact at Hospital: Emergency Room

Telephone of 24-hr Ambulance: 911

Distance to Hospital: Approximately 3.3 miles

Route to Hospital: Directions and figure are provided in APPENDIX D

11.0 OTHER CONSIDERATIONS

11.1 Heat & Cold Stress Monitoring

The SSO or Alternate shall monitor ambient temperature and implement the following work/rest regimes accordingly:

* For ambient temperatures between 15° and 70°F, standard rest breaks (i.e., fifteen minutes every four hours should be used).
  (Rest breaks will be taken inside the heated cab of the work and transport vehicles at the discretion of the workers)

* For temperatures below 15°F, work will be done at the discretion of the SSO or Alternate.

* For temperatures above 70°F, the following regime shall be followed for workers wearing permeable coveralls:

Adjusted Temperature (a)	Normal Work Ensemble (b)	Impermeable Ensemble
90°F or above	after 45 min. of work	after 15 min. of work
87.5°F to 90°F	after 60 min. of work	after 30 min. of work
82.5°F to 87.5°F	after 90 min. of work	after 60 min. of work
77.5°F to 82.5°F	after 120 min. of work	after 120 min. of work
77.2°F to 77.5°F	after 150 min. of work	after 120 min. of work

a) Calculate the adjusted air temperature (ta adj) by using this equation: ta adj degrees F = ta °F + 13° x sunshine). Measure air temperature (ta) with a standard mercury-in glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun causes shadows. (100 percent sunshine -no cloud cover and a sharp, distinct shadow; 0-percent sunshine - cloudy, no shadows).

b) A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Workers wearing semi-permeable or impermeable encapsulating protective clothing should be monitored when the temperature in the work area is above 70°F. To monitor the worker, measure:

1. **Heart Rate** - Count the radial pulse during a 30-second period as early as possible in the rest period. <u>If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third.</u> If the heart rate exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third. An alternate test is if the heart rate exceeds 140 beats per minute at the end of the work period, and 100 beats per minute at the end of the rest period, shorten the work cycle by one-third or lengthen the rest period by one-third.

2. **Oral Temperature** - Use a clinical thermometer (3 minutes under the tongue or similar device to measure the oral temperature at the end of the work period (before drinking). <u>If oral temperature exceeds 99.6° F, shorten the next work cycle by one-third.</u> If oral temperature still exceeds 99.6° F at the beginning of the next rest period, shorten the following work cycle by one-third.

Do not permit a worker to wear a semi-permeable or impermeable garment when their temperature exceeds 100.6° F. Workers shall not be required to continue working if they feel any of the symptoms of heart stress. Rest periods should be a minimum of 15 minutes. Length of rest periods should be extended as appropriate or as recommended by the SSO or Alternate.

11.2 Bloodborne Pathogens

FOR ANY SERIOUS INURY OR ACCIDENT CALL 911 IMMEDIATELY.

Risks and Exposures:
Anytime there is a potential for contact with blood, body fluids, or infectious materials such as broken glass, sharp objects, needles, etc., precautions must be taken.

Protection:
Treat all potentially infectious material as if it were infected

- Proper PPE must be used at all times when there is a chance for exposure to infectious materials.
- Hand-washing facilities or products (antiseptic hand cleaner, etc.) must be readily available to all employees.
- All infectious material must be placed in appropriate, labeled containers (sharps containers, biohazard bags, etc.) and disposed of properly.
- All infected equipment and surfaces must be decontaminated with an appropriate disinfecting solution prior to re-use.

11.3 Near Miss and Hazard Reporting

A Near Miss is an act or condition where no physical injury or property damage has occurred, but had the potential to result in injury or property damage. If a Near Miss incident occurs, the Stantec representative will initiate notification and reporting procedures. EMPLOYEES WHO REPORT CLOSE CALLS WILL NOT BE DISCIPLINED.

11.4 Fire Protection and Prevention

The fire department should be notified immediately once a fire is detected. Trained personnel using an appropriate fire extinguisher can extinguish incipient-stage fires. Larger fires will require the assistance of the fire department. The fire department must be informed of the nature of any combustible materials at the job site.

11.5 Hearing Conservation

Noise can cause sudden traumatic temporary hearing loss, long-term slowly occurring hearing loss that is irreversible.

- When noise levels exceed the permissible limits, worker exposure must be controlled through engineering controls, administrative controls, personal protective equipment (PPE), or a combination of these.
- Engineering controls consist of isolating, enclosing, or insulating equipment or operations or substituting quieter equipment or operations.
- Administrative controls involve rotating workers to jobs having lower noise exposures and reducing the time that each worker is exposed.
- PPE, for example earplugs and earmuffs, must be rated to reduce the noise exposure to within acceptable limits.

11.6 Time Out Program

When a safety, health, or environmental concern arises on a job, an employee has the right to call a “Time Out” or “Stop Work.” Upon calling a “Time Out”, the employee must immediately notify his/her supervisor and provide him/her with information regarding the nature of the safety, health, or environmental concern and state that a “Time Out” is being called.

The supervisor must contact the employee with the intent of resolving the employee’s concerns. When the concerns are resolved,work may resume. Please refer to Stantec Health and Safety Manual for additional procedures.

12.0 HEALTH AND SAFETY PLAN APPROVALS

Signature:____ Date:_____________

Stantec Health & Safety Advisor

Signature:__________________________ Date:_______

Stantec Project Manager

HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT

I (signatory below), have received a copy of the Health and Safety Plan for the Site. I have read the plan, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

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Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

Signature/Firm____ Date:_____________

13.0 HEALTH AND SAFETY PLAN REVISIONS

Date:________________

SSO Approval:____

Health and Safety Advisor Approval:____

Revision (describe below)

____

____

____

____

____

Date:________________

SSO Approval:____

Health and Safety Advisor Approval:____

Revision (describe below)

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Date:________________

SSO Approval:____

Health and Safety Officer Approval:____

Revision (describe below)

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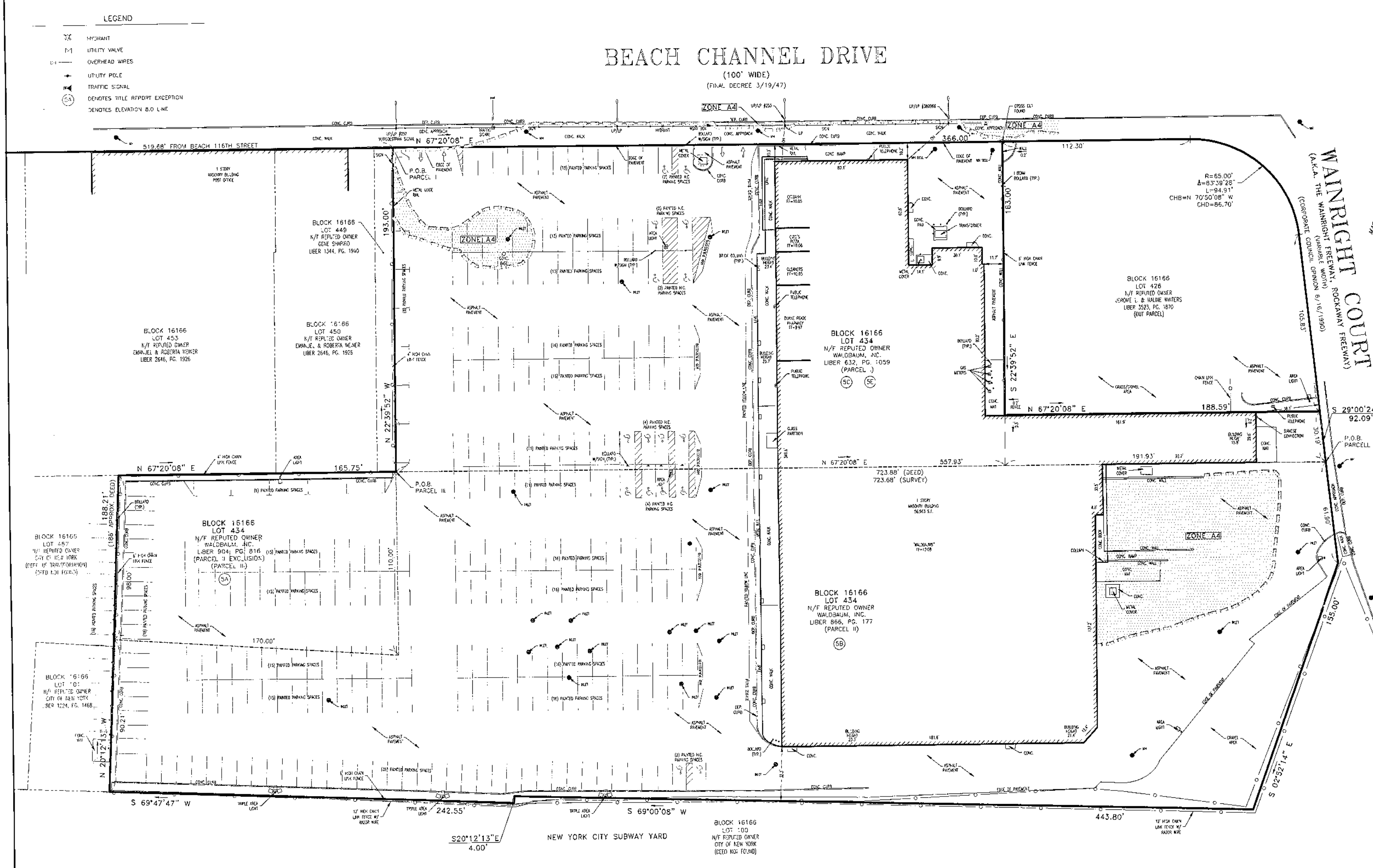
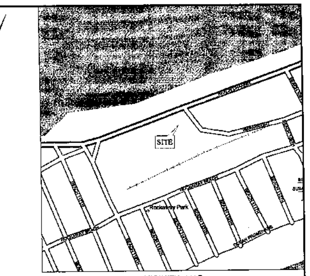
APPENDIX A

Figures





VICINITY MAP
© 1997 Delorme, Street Atlas U.S.A.

NOTES:

1. PROPERTY KNOWN AS LOT 434, BLOCK 16166, SECTION 62, AS SHOWN ON THE OFFICIAL TAX MAP OF THE BOROUGH OF QUEENS, QUEENS COUNTY, CITY AND STATE OF NEW YORK.
2. AREA = 218,422 S.F. OR 5.014 AC.
3. LOCATION OF ALL UNDERGROUND UTILITIES ARE APPROXIMATE. ALL LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS, ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF THE SURVEY. AVAILABLE ASBUILT PLANS AND UTILITY MARKOUT DOES NOT ENSURE MAPPING OF ALL UNDERGROUND UTILITIES AND STRUCTURES. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES
4. THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
5. THIS SURVEY IS PREPARED WITH REFERENCE TO A TITLE REPORT PREPARED BY LAWYERS TITLE INSURANCE CORPORATION, COMMITMENT NO. LT2K0156, WITH AN EFFECTIVE DATE OF APRIL 20, 2000, WHERE THE FOLLOWING SURVEY RELATED EXCEPTIONS APPEAR IN SCHEDULE B:
   - 5A $1.00 AWARD CLAUSE SET FORTH IN REEL 904, PAGE 816. AFFECTS PARCEL III. BLANKET-NOT SHOWN.
   - 5B $1.00 AWARD CLAUSE SET FORTH IN REEL 848, PAGE 287. AFFECTS PARCEL II. BLANKET-NOT SHOWN.
   - 5C PERMIT (CESSPOOL) RECORDED IN LIBER 6851, CP. 465. AFFECTS PARCEL I. BLANKET-NOT SHOWN.
   - 5D REMOVED PER CLIENTS COMMENTS OF 1-30-01.
   - 5E RESTRICTION SET FORTH IN LIBER 6845, CP. 437 AND LIBER 7393, CP. 292. AFFECTS PARCEL I. BLANKET-NOT SHOWN.
6. PROPERTY IS LOCATED PREDOMINATELY IN FLOOD HAZARD ZONE B (AREAS BETWEEN LIMITS OF THE 100-YEAR FLOOD AND 500-YEAR FLOOD; OR CERTAIN AREAS SUBJECT TO 100-YEAR FLOODING WITH AVERAGE DEPTHS LESS THAN ONE (1) FOOT OR WHERE THE CONTRIBUTING DRAINAGE AREA IS LESS THAN ONE SQUARE MILE; OR AREAS PROTECTED BY LEVEES FROM THE BASE FLOOD.) WITH A PORTION OF THE PROPERTY LOCATED IN FLOOD HAZARD ZONE A4 (ELEVATION 8) (AREAS OF 100-YEAR FLOOD; BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS DETERMINED.)
7. PROPERTY IS LOCATED IN ZONE M1-1 AND C8-1 PER REF. NO. 6
8. ELEVATIONS ARE BASED UPON NGVD 1929 DATUM.

REFERENCES:

1. THE OFFICIAL TAX MAP OF THE BOROUGH OF QUEENS, QUEENS COUNTY, NEW YORK, SHEET #9.
2. MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, CITY OF NEW YORK, NEW YORK, BRONX, RICHMOND, NEW YORK, QUEENS, AND KINGS COUNTIES, PANEL 110 & 121 OF 131, COMMUNITY-PANEL NUMBER 360497 0121 C & 360497 0110 C, MAP REVISED: MAY 18, 1992.
3. MAP ENTITLED "SITE PLAN, WALDBAUMS SUPERMARKET, SOUTHSIDE OF BEACH CHANNEL DRIVE, WEST OF ROCKAWAY FREEWAY", PREPARED BY R.A.L. ASSOCIATES, SUPERMARKET SPECIALISTS, INC., DATED 4-9-66.
4. MAP ENTITLED "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, TOPOGRAPHICAL BUREAU, MAP SHOWING STREET SYSTEM FOR THE TERRITORY DESIGNATED AS SECTION 202 OF THE FINAL MAPS OF THE BOROUGH OF QUEENS", DATED MARCH 17, 1916.
5. MAP #2741 DATED DECEMBER 13, 1939 SHOWING A CHANGE IN THE STREET SYSTEM OF THE BOROUGH OF QUEENS.
6. ZONING MAPS 30A & 30B PREPARED BY THE NEW YORK CITY PLANNING COMMISSION.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

METES AND BOUNDS DESCRIPTION
LOT 434, BLOCK 16166, SECTION 62
BOROUGH OF QUEENS
QUEENS COUNTY, CITY & STATE OF NEW YORK

BEGINNING AT A POINT ON THE SOUTHERLY LINE OF BEACH CHANNEL DRIVE (100' WIDE R.O.W.), SAID POINT BEING DISTANT 519.68 FEET EASTERLY AS MEASURED ALONG THE SAME FROM THE CORNER FORMED BY THE INTERSECTION OF THE SAID SOUTHERLY LINE OF BEACH CHANNEL DRIVE AND THE EASTERLY OF BEACH 116TH STREET AND RUNNING FROM SAID POINT OF BEGINNING, THENCE;

1. ALONG THE SOUTHERLY LINE OF BEACH CHANNEL DRIVE, NORTH 67 DEGREES - 20 MINUTES - 08 SECONDS EAST, A DISTANCE OF 366.00 FEET TO A CROSS CUT FOUND, THENCE; THE FOLLOWING TWO (2) COURSES ALONG THE DIVIDING LINE BETWEEN 434 AND LOT 426, BLOCK 16166:
2. SOUTH 22 DEGREES - 39 MINUTES - 52 SECONDS EAST, A DISTANCE OF 163.00 FEET TO A POINT, THENCE;
3. NORTH 67 DEGREES - 20 MINUTES - 08 SECONDS EAST, A DISTANCE OF 188.59 FEET TO A POINT ON THE WESTERLY LINE OF WAINRIGHT COURT (A.K.A. ROCKAWAY FREEWAY, THE FREEWAY, VARIABLE WIDTH), THENCE;
4. ALONG THE WESTERLY LINE OF WAINRIGHT COURT, SOUTH 29 DEGREES - 00 MINUTES - 24 SECONDS EAST, A DISTANCE OF 92.09 FEET TO A POINT, THENCE; THE FOLLOWING FOUR (4) COURSES ALONG THE DIVIDING LINE BETWEEN LOT 3, 4 & LOT 100, BLOCK 16166:
5. SOUTH 02 DEGREES - 52 MINUTES - 14 SECONDS EAST, A DISTANCE OF 155.00 FEET TO A POINT, THENCE;
6. SOUTH 69 DEGREES - 00 MINUTES - 08 SECONDS WEST, A DISTANCE OF 443.80 FEET TO A POINT, THENCE;
7. SOUTH 20 DEGREES - 12 MINUTES - 13 SECONDS EAST, A DISTANCE OF 4.00 FEET TO A POINT, THENCE;
8. SOUTH 69 DEGREES - 47 MINUTES - 47 SECONDS WEST, A DISTANCE OF 242.55 FEET TO A POINT, THENCE;
9. ALONG THE DIVIDING LINE BETWEEN LOT 434 AND LOTS 100, 487, BLOCK 16166, NORTH 20 DEGREES - 12 MINUTES - 13 SECONDS WEST, A DISTANCE OF 188.21 FEET TO A POINT, THENCE;
10. ALONG THE DIVIDING LINE BETWEEN LOT 434 AND LOTS 453, 450 & 449, BLOCK 16166, NORTH 67 DEGREES - 20 MINUTES - 08 SECONDS EAST, A DISTANCE OF 165.75 FEET TO A POINT, THENCE;
11. ALONG THE DIVIDING LINE BETWEEN LOT 434 AND LOT 449, BLOCK 16166, NORTH 22 DEGREES - 39 MINUTES - 52 SECONDS WEST, A DISTANCE OF 193.00 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 218,422 SQUARE FEET OR 5.014 ACRES.

THE ABOVE DESCRIPTION IS WRITTEN WITH REFERENCE TO A TITLE REPORT PREPARED BY LAWYERS TITLE INSURANCE CORPORATION, TITLE NO. LT2K0156, WITH AN EFFECTIVE DATE OF APRIL 20, 2000.

TO:
- THE GREAT ATLANTIC & PACIFIC TEA COMPANY, INC., A MARYLAND CORPORATION
- SECORE FINANCIAL CORPORATION
- MORGAN STANLEY DEAN WITTER MORTGAGE CAPITAL, INC. AND ITS SUCCESSORS AND/OR ASSIGNS
- LAWYERS TITLE INSURANCE CORPORATION
- BENENSON BELLE HARBOR, LLC, A DELAWARE, LIMITED LIABILITY COMPANY

THIS IS TO CERTIFY THAT (A) THIS MAP OF SURVEY AND THE PROPERTY DESCRIPTION WITH RESPECT THERETO ARE TRUE AND CORRECT AND REPRESENT AN ACTUAL FIELD SURVEY OF THE REAL PROPERTY SHOWN HEREON; (B) SUCH SURVEY WAS CONDUCTED UNDER THE DIRECT SUPERVISION OF THE UNDERSIGNED PROFESSIONAL LAND SURVEYOR; (C)SUCH MAP OF SURVEY SHOWS THE PREMISES SPECIFICALLY DESCRIBED IN COMMITMENT # LT2K0156, DATED APRIL 20, 2000; AND (D) SUCH MAP OF SURVEY WAS MADE (I) IN ACCORDANCE WITH "MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS", JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND ACSM IN 1999 AND INCLUDES ITEMS 2-4, 6, 7A, 7B(1), 7B(2), 8-10, 11A AND 13-15 OF TABLE A THEREOF, "OPTIONAL SURVEY RESPONSIBILITIES AND SPECIFICATIONS", SPECIALLY DEFINED THEREIN, AND (II) PURSUANT TO THE ACCURACY STANDARDS (AS ADOPTED BY ALTA AND ACSM AND IN EFFECT ON THE DATE OF THIS CERTIFICATION). THE UNDERSIGNED FURTHER CERTIFIES THAT POSITIONAL UNCERTAINTIES RESULTING FROM THE SURVEY MEASUREMENTS MADE ON THE SURVEY DO NOT EXCEED THE ALLOWABLE POSITIONAL TOLERANCE.

1-31-2001
DATE

GREGORY S. GALLAS
NEW YORK PROFESSIONAL
LAND SURVEYOR NO. #50124

PARKING SUMMARY

REGULAR PARKING SPACES	= 283
HANDICAPPED PARKING SPACES	= 16
TOTAL PARKING SPACES	= 299

No.	DESCRIPTION OF REVISION	BY:	DATE
3	ADD CERTIFICATION, DIMENSIONS & REMOVE TITLE EXCEPTION	M.L.O.	1-31-2001
2	REVISE TO SHOW PARKING LOT SUMMARY	D.W.	11-15-00
1	ADD ZONE A4 FLOOD LINES	T.J.D.	10-11-00

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S EMBOSSED SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES. CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYORS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS. SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS

NOT VALID UNLESS SEALED

1-31-2001
DATE

GREGORY S. GALLAS
NEW YORK PROFESSIONAL LAND SURVEYOR #50124

FIELD DATE	7-28-00 10-5-00
F/B NO.	00-14
F/B PG.	152-154
DRAWN	T.J.D.
CHECKED	T.F.M.
REV. NO.	3

ALTA/ACSM LAND TITLE SURVEY
WALDBAUM, INC.
112-115 BEACH CHANNEL DRIVE
LOT 434, BLOCK 16166, SECTION 62
BOROUGH OF QUEENS
QUEENS COUNTY, CITY AND STATE OF NEW YORK

CONTROL POINT ASSOCIATES, INC.
776 MOUNTAIN BOULEVARD
WATCHUNG, NJ 07060
908.668.0099 - 908.668.9595 FAX
GWYNEDD CORPORATE CENTER
1120 WELSH ROAD, SUITE 200
NORTH WALES, PA 19454
215.412.9055 - 215.412-0861 FAX

DATE	SCALE	FILE NO.	DWG. NO.
8-17-2000	1"=30'	C00250	1 OF 1

#616

APPENDIX B

Training Certificates for Site Personnel

Certificate of Completion

This certifies that

Donald Moore

has successfully completed

8 Hour HAZWOPER Refresher Training

Refresher certification does NOT necessarily indicate initial 24 or 40 Hour HAZWOPER certification

In Accordance w/Federal OSHA Regulation 29 CFR 1910.120(e) & (p)

And all State OSHA/EPA Regulations as well including 29 CFR 1926.65 for Construction.

This course (Version 2) is approved for 8 Contact Hours (0.8 CEUs) of continuing education per the California Department of Public Health for Registered Environmental Health Specialist (REHS) (Accreditation # 044).

Safety Unlimited, Inc., Provider #5660170-2, is accredited by the International Association for Continuing Education and Training (IACET) and is accredited to issue the IACET CEU. As an IACET Accredited Provider, Safety Unlimited, Inc. offers CEUs for its programs that qualify under the ANSI/IACET Standard. Safety Unlimited, Inc. is authorized by IACET to offer 0.8 CEUs for this program.

Julius P. Griggs

Julius P. Griggs
Instructor #892

240123537698
Certificate Number

1/23/2024
Issue Date

ACCREDITED IACET PROVIDER

Scan this code or visit safetyunlimited.com/v to verify certificate.

SAFETY UNLIMITED, Inc.
OSHA Compliant Safety Training Since 1993

2139 Tapo St., Suite 228 Simi Valley,CA 93063
(855) 784-2677 or 805 306-8027
https://www.safetyunlimited.com

Proof of initial certification and subsequent refresher training is NOT required to take refresher training

Certificate of Completion

This certifies that

Jason Ward

has successfully completed

8 Hour HAZWOPER Refresher Training

Refresher certification does NOT necessarily indicate initial 24 or 40 Hour HAZWOPER certification

In Accordance w/Federal OSHA Regulation 29 CFR 1910.120(e) & (p)

And all State OSHA/EPA Regulations as well including 29 CFR 1926.65 for Construction.

This course (Version 4) is approved for 8 Contact Hours (0.8 CEUs) of continuing education per the California Department of Public Health for Registered Environmental Health Specialist (REHS) (Accreditation # 044)

Safety Unlimited, Inc., Provider #5660170-2, is accredited by the International Association for Continuing Education and Training (IACET) and is accredited to issue the IACET CEU. As an IACET Accredited Provider, Safety Unlimited, Inc. offers CEUs for its programs that qualify under the ANSI/IACET Standard. Safety Unlimited, Inc. is authorized by IACET to offer 0.8 CEUs for this program.

Julius P. Griggs

Julius P. Griggs
Instructor #892

230112537700

Certificate Number

1/12/2023

Issue Date

ACCREDITED IACET PROVIDER

Scan this code or visit safetyunlimited.com/v to verify certificate.

SAFETY UNLIMITED, Inc.
OSHA Compliant Safety Training Since 1993

2139 Tapo St., Suite 228 Simi Valley,CA 93063
(855) 784-2677 or 805 306-8027
https://www.safetyunlimited.com

Proof of initial certification and subsequent refresher training is NOT required to take refresher training

Certificate of Completion

This certifies that

Jennifer Nair

has successfully completed

8 Hour HAZWOPER Refresher Training

Refresher certification does NOT necessarily indicate initial 24 or 40 Hour HAZWOPER certification

In Accordance w/Federal OSHA Regulation 29 CFR 1910.120(e) & (p)

And all State OSHA/EPA Regulations as well including 29 CFR 1926.65 for Construction.

This course (Version 2) is approved for 8 Contact Hours (0.8 CEUs) of continuing education per the California Department of Public Health for Registered Environmental Health Specialist (REHS) (Accreditation # 044).

Safety Unlimited, Inc., Provider #5660170-2, is accredited by the International Association for Continuing Education and Training (IACET) and is accredited to issue the IACET CEU. As an IACET Accredited Provider, Safety Unlimited, Inc. offers CEUs for its programs that qualify under the ANSI/IACET Standard. Safety Unlimited, Inc. is authorized by IACET to offer 0.8 CEUs for this program.

Julius P. Griggs
Julius P. Griggs
Instructor #892

2406075278220
Certificate Number

6/7/2024
Issue Date

ACCREDITED IACET PROVIDER

Scan this code or visit safetyunlimited.com/v to verify certificate.

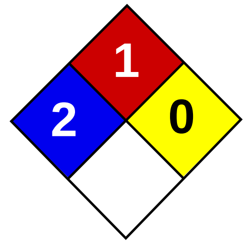
SAFETY UNLIMITED, Inc.
OSHA Compliant Safety Training Since 1993

2139 Tapo St., Suite 228 Simi Valley,CA 93063
(855) 784-2677 or 805 306-8027
https://www.safetyunlimited.com

Proof of initial certification and subsequent refresher training is NOT required to take refresher training

APPENDIX C

Material Safety Data Sheets (MSDSs)



Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Trichloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Trichloroethylene

Catalog Codes: SLT3310, SLT2590

CAS#: 79-01-6

RTECS: KX4560000

TSCA: TSCA 8(b) inventory: Trichloroethylene

CI#: Not available.

Synonym:

Chemical Formula: C2HCl3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Trichloroethylene	79-01-6	100

Toxicological Data on Ingredients: Trichloroethylene: ORAL (LD50): Acute: 5650 mg/kg [Rat]. 2402 mg/kg [Mouse]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 420°C (788°F)

Flash Points: Not available.

Flammable Limits: LOWER: 8% UPPER: 10.5%

Products of Combustion: These products are carbon oxides (CO, CO_2), halogenated compounds.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/

spray. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 50 STEL: 200 (ppm) from ACGIH (TLV) TWA: 269 STEL: 1070 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 131.39 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 86.7°C (188.1°F)

Melting Point: -87.1°C (-124.8°F)

Critical Temperature: Not available.

Specific Gravity: 1.4649 (Water = 1)

Vapor Pressure: 58 mm of Hg (@ 20°C)

Vapor Density: 4.53 (Air = 1)

Volatility: Not available.

Odor Threshold: 20 ppm

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in methanol, diethyl ether, acetone. Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity:
Extremely corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 2402 mg/kg [Mouse]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in human. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Trichloroethylene : UN1710 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Trichloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Trichloroethylene Pennsylvania RTK: Trichloroethylene Florida: Trichloroethylene Minnesota: Trichloroethylene Massachusetts RTK: Trichloroethylene New Jersey: Trichloroethylene TSCA 8(b) inventory: Trichloroethylene CERCLA: Hazardous substances.: Trichloroethylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36/38- Irritating to eyes and skin. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:54 PM

Last Updated: 11/06/2008 12:00 PM

SAFETY-KLEEN REFINED PERCHLOROETHYLENE
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **SAFETY-KLEEN REFINED PERCHLOROETHYLENE**

SYNONYMS: Tetrachloroethylene; Tetrachloroethene; Perchloroethene; 1,1,2,2-Tetrachloroethylene

PRODUCT CODE: 1021737, 1024737

PRODUCT USE: Cleaning agent.
If this product is used in combination with other products, refer to the Material Safety Data Sheet for those products.

This number is for emergency use only. If you desire non-emergency product information, please call a phone number listed below.

24-HOUR EMERGENCY PHONE NUMBER
MEDICAL AND TRANSPORTATION (SPILL):

1-800-468-1760

SUPPLIER: Safety-Kleen Systems, Inc.
5400 Legacy Drive
Cluster II, Building 3
Plano, Texas 75024
USA
1-800-669-5740
www.Safety-Kleen.com

TECHNICAL INFORMATION: 1-800-669-5740 Press 1 then 1, then Extension 7500

MSDS FORM NUMBER: 82335 **ISSUE:** November 1, 2005

ORIGINAL ISSUE: August 1982 **SUPERSEDES:** November 26, 2002

PREPARED BY: Product MSDS Coordinator **APPROVED BY:** MSDS Task Force

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

				OSHA PEL**		ACGIH TLV®			
WT%	NAME	SYNONYM	CAS NO.	TWA ppm	STEL	TWA ppm	STEL ppm	LD[a]	LC[b]
97-100	Ethene,tetrachloro-	Perchloroethylene; Tetrachloroethylene	127-18-4	100	N.Av.	25	100	2629 (150) [c]	6200

N. Av. = Not Available
[a]Oral-Rat LD_{50} (mg/kg)
[b]Inhalation-Mouse LC_{50}(mg/kg/4H)
[c]NIOSH ILDH ppm

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE
Clear, colorless liquid, slight sweet odor.

WARNING!

HEALTH HAZARDS
May be harmful if inhaled.
May be harmful if swallowed.
May irritate the respiratory tract (nose, throat, and lungs), eyes, and skin.
Suspect cancer hazard. Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure.
Contains material which may cause liver, kidney, and central nervous system damage.

ENVIRONMENTAL HAZARDS
Toxic to fish.

POTENTIAL HEALTH EFFECTS

INHALATION (BREATHING): High concentrations of vapor or mist may be harmful if inhaled. High concentrations of vapor or mist may irritate the respiratory tract (nose, throat, and lungs). High concentrations of vapor or mist may cause nausea, vomiting, headaches, dizziness, loss of coordination, numbness, and other central nervous system effects. High concentrations of vapor or mist may cause liver and kidney damage.

EYES: May cause irritation. Symptoms include itching, burning, redness and tearing.

SKIN: May cause irritation. Not likely to be absorbed through the skin in harmful amounts.

INGESTION (SWALLOWING): This product may be harmful if swallowed. May cause throat irritation, nausea, vomiting, central nervous system effects as noted under **INHALATION (BREATHING)**, unconsciousness, coma, and death.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing cardiovascular, liver, kidney, respiratory tract (nose, throat, and lungs), central nervous system, eye, and/or skin disorders may have increased susceptibility to the effects of exposure.

CHRONIC: Prolonged or repeated inhalation may cause toxic effects as noted under **INHALATION (BREATHING)**. Prolonged or repeated eye contact may cause inflammation of the membrane lining the eyelids and covering the eyeball (conjunctivitis). Prolonged or repeated skin contact may cause drying, cracking, redness, itching, and/or swelling (dermatitis).

CANCER INFORMATION: This product contains perchloroethylene CAS 127-18-4 which may cause cancer if inhaled. Risk of cancer depends on duration and level of exposure. For more information, see **SECTION 11: CARCINOGENICITY.**

Also see **SECTION 15: CALIFORNIA**.

POTENTIAL ENVIRONMENTAL EFFECTS : Toxic to fish. Also see **SECTION 12: ECOLOGICAL INFORMATION**.

SECTION 4: FIRST AID MEASURES

INHALATION (BREATHING): Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Oxygen should only be administered by qualified personnel. Someone should stay with victim. Get medical attention if breathing difficulty persists.

EYES: If irritation or redness from exposure to vapor develops, move away from exposure into fresh air. Upon contact, immediately flush eyes with plenty of lukewarm water, holding eyelids apart, for 15 minutes. Get medical attention.

SKIN: Remove affected clothing and shoes. Wash skin thoroughly with soap and water. Get medical attention if irritation or pain develops or persists. Wash contaminated clothing before reuse. Discard any shoes or clothing items that cannot be decontaminated.

INGESTION (SWALLOWING): Do NOT induce vomiting. Immediately get medical attention. Call 1-800-468-1760 for additional information. If spontaneous vomiting occurs, keep head below hips to avoid breathing the product into the lungs. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Treat symptomatically and supportively. Do not administer Adrenaline (epinephrine) or similar drugs following product overexposure. Increased sensitivity of the heart to such drugs may be caused by overexposure to product. Administration of gastric lavage and/or activated charcoal slurry, if warranted, should be performed by qualified medical personnel. Treatment may vary with condition of victim and specifics of incident. Call 1-800-468-1760 for additional information.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: Not applicable

FLAMMABLE LIMITS IN AIR: **LOWER:** Not applicable **UPPER:** Not applicable

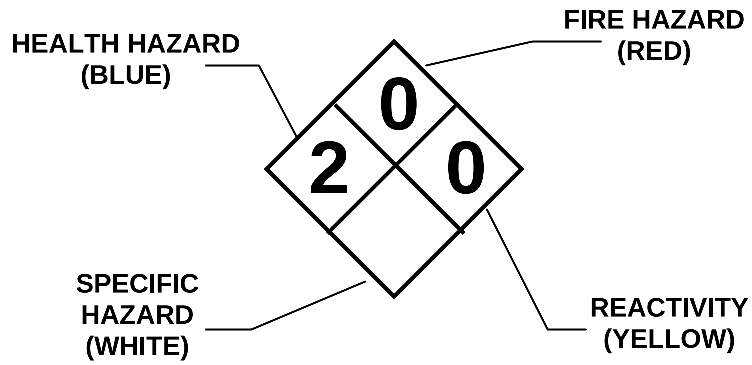
AUTOIGNITION TEMPERATURE: Not applicable

HAZARDOUS COMBUSTION PRODUCTS: Product itself does not burn, but may decompose upon heating to produce phosgene, halogenated compounds, hydrogen chloride gas, carbon monoxide, and unidentified organic compounds.

CONDITIONS OF FLAMMABILITY: Product will not burn.

EXTINGUISHING MEDIA: Carbon dioxide, regular foam, dry chemical, water spray, or water fog.

NFPA 704 HAZARD IDENTIFICATION: This information is intended solely for the use by individuals trained in this system.



FIRE FIGHTING INSTRUCTIONS: Keep storage containers cool with water spray. A positive-pressure, self-contained breathing apparatus (SCBA) and full-body protective equipment are required for fire emergencies.

FIRE AND EXPLOSION HAZARDS: Heated containers may rupture. "Empty" containers may retain residue and can be dangerous. Product is not sensitive to mechanical impact or static discharge.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Do not touch or walk through spilled product. Stop leak if you can do it without risk. Wear protective equipment and provide engineering controls as specified in **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Ventilate area and avoid breathing vapor or mist. Contain spill away from surface water and sewers. Contain spill as a liquid for possible recovery, or sorb with compatible sorbent material and shovel with a clean, spark proof tool into a sealable container for disposal.

Additionally, for large spills: Dike far ahead of liquid spill for collection and later disposal.

There may be specific federal regulatory reporting requirements associated with spills, leaks, or releases of this product. Also see **SECTION 15: REGULATORY INFORMATION.**

SECTION 7: HANDLING AND STORAGE

HANDLING: Keep away from sparks or flame. Use clean tools. Do not breathe vapor or mist. Use in a well ventilated area. Avoid contact with eyes, skin, clothing, and shoes.

SHIPPING AND STORING: Keep container tightly closed when not in use and during transport. Store containers in a cool, dry place. Do not pressurize, cut, weld, braze, solder, drill, or grind containers. Empty product containers may retain product residue and can be dangerous.

See **SECTION 14: TRANSPORTATION INFORMATION** for Packing Group information.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide general ventilation needed to maintain concentration of vapor or mist below applicable exposure limits. Where adequate general ventilation is unavailable, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Use NIOSH-certified, air-supplied respirators (self-contained breathing apparatus or air-line) respiratory protective equipment when concentration of vapor or mist exceeds applicable exposure limits. Selection and use of respiratory protective equipment should be in accordance in the USA with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4. Consult a qualified Industrial Hygienist or Safety Professional for respirator selection guidance.

EYE PROTECTION: Where eye contact is likely, wear chemical goggles; contact lens use is not recommended.

SKIN PROTECTION: Where skin contact is likely, wear laminate or equivalent protective gloves; use of natural rubber (latex) or equivalent gloves is not recommended.

To avoid prolonged or repeated contact where spills and splashes are likely, wear appropriate chemical-resistant face shield, boots, apron, whole body suits, or other protective clothing.

PERSONAL HYGIENE: Use good personal hygiene. Wash thoroughly with soap and water after handling product and before eating, drinking, or using tobacco products. Clean affected clothing, shoes, and protective equipment before reuse. Discard leather articles, such as shoes, saturated with this product.

OTHER PROTECTIVE EQUIPMENT: Where spills and splashes are likely, facilities storing or using this product should be equipped with an emergency eyewash and shower, both equipped with clean water, in the immediate work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE, APPEARANCE, AND ODOR:	Clear, colorless liquid, slight sweet odor.
ODOR THRESHOLD:	50 ppm
MOLECULAR WEIGHT:	165.8
SPECIFIC GRAVITY:	1.62 (water = 1)
DENSITY:	13.5 LB/US gal (1620 g/l)
VAPOR DENSITY:	5.2 (air = 1)
VAPOR PRESSURE:	14 mm Hg at 68ºF (20ºC)
BOILING POINT:	250ºF (121ºC)
FREEZING/MELTING POINT:	-2ºF (-19ºC)
pH:	Not applicable
EVAPORATION RATE:	2.8 (butyl acetate = 1)
SOLUBILITY IN WATER:	Insoluble
FLASH POINT:	Not applicable
FLAMMABLE LIMITS IN AIR:	**LOWER:** Not applicable **UPPER:** Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable under normal temperatures and pressures. Avoid heat, sparks or flame when not in use.
INCOMPATIBILITY:	Avoid acids, alkalies, oxidizing agents, or reactive metals.
REACTIVITY:	Polymerization is not known to occur under normal temperature and pressures. Not reactive with water.

HAZARDOUS DECOMPOSITION PRODUCTS:	None under normal temperatures and pressures. See also **SECTION 5: HAZARDOUS COMBUSTION PRODUCTS**.

SECTION 11: TOXICOLOGICAL INFORMATION

SENSITIZATION:	Based on best current information, there is no known human sensitization associated with this product.
MUTAGENICITY:	Perchloroethylene has demonstrated experimental effects of mutagenicity.
CARCINOGENICITY:	Perchloroethylene is categorized by IARC as probably carcinogenic to humans (Group 2A). Perchloroethylene is listed by NTP as reasonably anticipated to be a carcinogen. As per ACGIH, perchloroethylene is categorized as a confirmed animal carcinogen with unknown relevance to humans (A3). This agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at sites(s), of histologic type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure. Also see **SECTION 3: CANCER INFORMATION** and **SECTION 15: CALIFORNIA**.
REPRODUCTIVE TOXICITY:	Perchloroethylene has demonstrated animal effects of reproductive toxicity.
TERATOGENICITY:	Perchloroethylene has demonstrated experimental effects of teratogenicity.
TOXICOLOGICALLY SYNERGISTIC PRODUCT(S):	Based on best current information, there are no known toxicologically synergistic products associated with this product.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY:

Toxic to fish.
Component Analysis - Ecotoxicity - Aquatic Toxicity

Ethene,tetrachloro- (127-18-4)

Test & Species		Conditions
96 Hr LC50 rainbow trout	5.28 mg/L	static, 12 ºC
96 Hr LC50 fathead minnow	13.4 mg/L	flow-through
96 Hr LC50 bluegill	12.9 mg/L	static

OCTANOL/WATER PARTITION COEFFICIENT: 2.53-2.88 @ 68ºF (20ºC)

VOLATILE ORGANIC COMPOUNDS: 0 WT%; 0 LB/US gal: 0 g/l
As per 40 CFR Part 51.100(s)

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL: Dispose in accordance with federal, state, provincial, and local regulations. Regulations may also apply to empty containers. The responsibility for proper waste disposal lies with the owner of the waste. Contact Safety-Kleen regarding proper recycling or disposal.

USEPA WASTE CODE(S): U210
Based on available data, this information applies to the product as supplied to the user. Processing, use, or contamination by the user may change the waste code applicable to the disposal of this product.

SECTION 14: TRANSPORT INFORMATION

DOT:
Shipping Name: Tetrachloroethylene
UN/NA #: UN1897 **Hazard Class:** 6.1 **Packing Group:** III

TDG:
Shipping Name: Tetrachloroethylene
UN/NA #: UN1897 **Hazard Class:** 6.1 **Packing Group:** III

EMERGENCY RESPONSE GUIDE NUMBER: 160
Reference *North American Emergency Response Guidebook*

SECTION 15: REGULATORY INFORMATION

USA REGULATIONS

OSHA

OSHA Regulated Chemicals
Ethene,tetrachloro- (127-18-4)
Present (Select Carcinogen)

SARA SECTIONS 302 AND 304:

Based on the ingredient(s) listed in **SECTION 2**, this product does not contain any "extremely hazardous substances" listed pursuant to Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Section 302 or Section 304 as identified in 40 CFR Part 355, Appendix A and B.

SARA SECTIONS 311 AND 312:

This product poses the following health hazard(s) as defined in 40 CFR Part 370 and is subject to the requirements of sections 311 and 312 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA):

Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard

SARA SECTION 313:

The following component is subject to the requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

Material	CAS	De Minimis Concentration
Perchloroethylene	127-18-4	0.1 %

CERCLA:

Based on the ingredient(s) listed in SECTION 2, this product contains the following "hazardous substance(s)" listed under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) in 40 CFR Part 302, Table 302.4 with the following reportable quantities (RQ):

Material	CAS	RQ (final)
Perchloroethylene	127-18-4	100 LB (45.4 KG)

TSCA:

All the components of this product are listed on, or are automatically included as "naturally occurring chemical substances" on, or are exempted from the requirement to be listed on, the TSCA Inventory.

CALIFORNIA: This product does contain a detectable amount of perchloroethylene CAS 127-18-4. WARNING: This chemical is known to the State of California to cause cancer.

This product does not contain detectable amounts of any chemical known to the State of California to cause birth defects or other reproductive harm.

CANADIAN REGULATIONS
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all information required by the CPR.

WHMIS: D1B, D2A, D2B

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All the components of this product are listed on, or are automatically included as "substance occurring in nature" on, or are exempted from the requirements to be listed on, the Canadian Domestic Substances List (DSL).

SECTION 16. OTHER INFORMATION

REVISION INFORMATION: This MSDS has been revised in the following sections: 1, 2, 3, 4, 11, 12, 13, 15, and 16.

LABEL/OTHER INFORMATION: No additional information available.

GAS INNOVATIONS

MATERIAL SAFETY DATA SHEET (MSDS) ISOBUTYLENE

PRODUCT IDENTIFICATION	▪D.O.T. SHIPPING NAME	Isobutylene
	▪SYNONYM (S)	Liquefied Petroleum Gas, Isobutene, 2 Methylpropene
	▪D.O.T. I.D. NUMBER	UN-1055
	▪D.O.T. HAZZARD CLASS	2.1 Flammable Gas
	▪D.O.T. LABEL (S)	Flammable Gas
	▪C.A.S. NUMBER	115-11-7
	▪CHEMICAL FORMULA	C_4H_8 or $(CH_3)_2C{:}CH_2$

PHYSICAL DATA	▪MOLECULAR WEIGHT	56.108
	▪FREEZING POINT	-140.4°C, -220.6°F
	▪BOILING POINT	-6.9°C, 19.6°F
	▪VAPOR PRESSURE	168 kPa (gauge), 24.3 psig @21.1°C
	▪SPECIFIC VOLUME	$0.418m_3$/kg, 6.7 ft_3/lb @ 1 atm, 21.1°C
	▪RELATIVE DENSITY, (air=1)	1.947 @ 1 atm, 25°C
	▪SOLUBILITY IN WATER	Negligible
	▪DESCRIPTION	At room temperature and atmospheric pressure isobutene is a colorless, flammable gas, with an unpleasant odor. It is shipped as a liquefied gas under its own vapor pressure.

FIRE AND EXPLOSION HAZARD DATA	▪FLAMMABLE LIMITS IN AIR	1.8 – 9.6 % by volume
	▪AUTO-IGNITION TEMPERATURE	465°C, 869°F
	▪ FIRE FIGHTING PROCEDURES	The only safe way to extinguish an isobutylene fire is to stop the flow of gas. If the flow cannot be stopped, let the fire burn out while cooling the cylinder and the surroundings using a water spray. Personnel may have to wear approach type protective suits and positive pressure self-contained breathing apparatus. Firefighters' turnout gear may be inadequate. Small secondary fires may be brought under control by using carbon dioxide or a dry chemical fire extinguisher and stopping the flow.

Date prepared: September 7, 2007

18005 E. Hwy 225 La Porte, TX 77571 www.gasinnovations.com Ph: 281-471-2200 Fax: 281-471-2201

	▪UNUSUAL HAZARDS	1. Cylinders exposed to fire may rupture with violent force. Extinguish surrounding fire and keep cylinders cool by applying water from a maximum possible distance with a water spray. 2. Flammable gases may spread from a spill after the fire is extinguished and be subject to re-ignition.
HEALTH HAZARD DATA	▪ PERMISSIBLE EXPOSURE LIMITS	OSHA TWA None established. ASGIH TWA None established.
	▪ ACCUTE EFFECTS OVEREXPOSURE	Isobutylene is a simple asphyxiant. Inhalation of high concentrations may cause rapid respiration, dizziness, fatigue, and nausea. Massive exposure may cause unconsciousness and death. Contact with the liquid phase or with the cold has escaping from a cylinder may cause frostbite.
	▪ CHRONIC EFFECTS OF OVEREXPOSURE	None known.
FIRST AID INFORMATION	▪ INHALATION	Move victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
	▪ CONTACT	Treat for frostbite.
REACTIVITY DATE	▪ STABILITY	(X) Stable. ( ) Unstable.
	▪ INCOMPATIBILITY	Oxidizing materials and compounds that can add across double bonds.
	▪ HAZARDOUS DECOMPOSITION/ OXIDATION PRODUCTS	Carbon monoxide, carbon dioxide.
	▪ POLYMERIZATION	(X) Will not occur ( ) May occur
SPILL OR LEAKAGE PROCEDURE	Shut off all ignition sources and ventilate the area. For controlling large flow, personnel may have to wear approach-type protective suits and positive pressure self-contained breathing apparatus.	

Date prepared: September 7, 2007

PRECAUTIONS	▪ STORAGE RECOMMENDATIONS	Cylinders should be stored and used in dry, cool, well-ventilated areas away from sources of heat or ignition. Do not store with oxidizers
	▪ PERSONAL PROTECTIVE EQUIPMENT	1. Eye protection – Safety glasses should be worn. 2. Respiratory protection – Approved respiratory equipment must be worn when airborne concentrations exceed safe levels. 2. Skin protection – No specific equipment is required. Gloves are recommended for cylinder handling.
	▪ BEFORE USING THE GAS	1. Secure the cylinder to prevent it from failing or being Knocked over. 2. Leak check the lines and equipment. 3. Have an emergency plan covering steps to be taken in the event of an accidental release.

DISCLAIMER

Date prepared: September 7, 2007

MSDS Code: PTI001
Date Prepared: 02/11/2004

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name:	Methanol
General or Generic ID:	Alcohol
CAS Number:	67-56-1
Manufacturer/Supplier:	Purification Technologies, Inc. (PTI)
Address:	67 Winthrop Rd., Chester, CT 06412
General Assistance:	860-526-7801 (Mon-Fri, 8:30 am to 5:00 pm)
Emergency Number:	860-526-7801 (Calls during hours other than "General Assistance" will be forwarded to key personnel)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	% Weight
Methanol	67-56-1	100.0%

3. HAZARDS IDENTIFICATION

Potential Health Effects:

Eye: May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

Skin: May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, drying and cracking of skin, and skin burns. Passage of this material into the body through the skin is possible, and may add to toxic effects from breathing or swallowing.

Swallowing: Swallowing this material may be harmful.

Inhalation: Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Symptoms of Exposure: Signs and symptoms of exposure to this material through breathing, swallowing and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), leg cramps, pain in the abdomen and lower back, blurred vision, shortness of breath, cyanosis (causes blue coloring of the skin and nails from lack of oxygen), visual impairment (including blindness), coma and death.

Target Organ Effects: Exposure to lethal concentrations of methanol has been shown to cause damage to organs including liver, kidneys, pancreas, heart, lungs and brain. Although this rarely occurs, survivors of sever intoxication may suffer from permanent neurological damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: liver abnormalities, central nervous system damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: visual impairment.

Developmental Information: Methanol has caused birth defects in laboratory animals, but only when inhaled at extremely high vapor concentrations. The relevance of this finding to humans is uncertain.

Cancer Information: Based on the available information, this material cannot be classified with regard to carcinogenicity. This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

Other Health Effects: No data.

Primary Route(s) of Entry: Inhalation, skin absorption, skin contact, eye contact, ingestion.

4. FIRST AID MEASURES

Eyes: If symptoms develop, move individuals away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin: Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion: Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation: If symptoms develop, remove individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen if available. Keep person warm and quiet; seek immediate medical attention.

Notes to Physicians: This product contains methanol which can cause intoxication and central nervous system depression. Methanol is metabolized to formic acid and formaldehyde. These metabolites can cause metabolic acidosis, visual disturbances and blindness. Since metabolism is required for these toxic symptoms, their onset may be delayed from 6 to 30 hours following ingestion. Ethanol competes for the same metabolic pathway and has been used to prevent methanol metabolism. Ethanol administration is indicated in symptomatic patients or at blood methanol concentrations above 20 ug/dl. Methanol is effectively removed by hemodialysis. Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin, lung (for example, asthma-like conditions), liver, kidney, central nervous system, pancreas, heart. Exposure to this material may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias.

5. FIREFIGHTING MEASURES

Flashpoint: 54.0°F (12.2°C) TCC
Lower Explosive Limit: (for product) 6.0%
Upper Explosive Limit: (for product) 36.0%

Autoignition Temperature: 725.00°F (385.00°C)

Hazardous Products of Combustion: May form carbon dioxide and carbon monoxide.

Fire and Explosion Hazards: Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point. Never use w elding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. During a fire, irritating or toxic decomposition products may be generated.

Extinguishing Media: Alcohol foam, carbon dioxide, dry chemical.

Firefighting Instructions: Water may be ineffective. Water may be used to keep fire-exposed containers cool until fire is out. Wear a self-contained breathing apparatus w ith a full facepiece operated in the positive pressure demand mode w ith appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating:

Health: 1	Flammability: 3	Reactivity: 0

6. ACCIDENTAL RELEASES MEASURES

Small Spill: Absorb liquid on vermiculite, floor absorbent or other absorbent material.

Large Spill: Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not w earing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sew ers, streams or other bodies of w ater. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal. Prevent run-off to sew ers, streams or other bodies of w ater. If run-off occurs, notify proper authorities as required, that a spill has occurred.

7. HANDLING AND STORAGE

Handling: Containers of this material may be hazardous w hen emptied. Since emptied container retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five-gallon pails and larger metal containers, including tank cars and tank trucks, should be grounded and/or bonded w hen material is transferred. **WARNING**: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions w ithout the presence of obvious ignition sources Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes w ithout analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Eye Protection: Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection: Wear resistant gloves (consult your safety equipment supplier). To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

Respiratory Protection: If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH/MSHA approved air-supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Engineering Controls: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines

Ingredient	**OSHA PEL**	**OSHA VPEL**		**ACGIH TLV**	
Methanol 67-56-1	**TWA**	**TWA** (skin)	**STEL** (skin)	**TWA** (skin)	**STEL** (skin)
	200 ppm	200 ppm	250 ppm	200 ppm	250 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 147.0°F(63.8°C) @ 760 mmHg
Vapor Pressure: 97.680 mmHg @ 68.00°F
Specific Vapor Density: 1.110 @ AIR=1
Specific Gravity: .792 @ 68.00°F
Liquid Density: 6.600 lbs/gal @ 68.00°F
0.792 kg/l @ 20°C
% Volatile: 100.0%
Volatile Organic Compounds:
100.00%
795.00 g/l
6.630 lbs/gal
Bulk Density: 0.890 lbs/ft^3

Evaporation Rate: 2.10 (N-Butyl Acetate)
Appearance: Clear, mobile
State: Liquid
Physical Form: Neat
Color: Colorless
Odor: Mild Alcohol
pH: No Data
Viscosity: 0.6 cps
Freezing Point: -144.00 ° F (-97.7 °C)
Molecular Weight: 32.00
% Solubility in Water: Complete

10. STABILITY AND REACTIVITY

Hazardous Polymerization: Product will not undergo hazardous polymerization.

Hazardous Decomposition: May form: carbon dioxide and carbon monoxide.

Chemical Stability: Stable.

Incompatibility: Avoid contact with: calcium hypochlorite, hypochlorites, peroxides, sodium, strong acids, strong bases, strong oxidizing agents, zinc.

11. TOXICOLOGICAL DATA

No data.

12. ECOLOGICAL DATA

No data.

13. DISPOSAL CONSIDERATIONS

Waste Management Information Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT) 49 CFR 172.101
Proper Shipping Name: Methanol
Hazard Class: 3
UN/NA Code: UN1230
Packing Group: PG II
Bill of Lading Description: Methanol, 3, UN 1230, PGII
Labels Required: Flammable Liquid
Placards Required: Flammable Liquid

NOS Component: None

RQ (Reportable Quantity), 49 CFR 172.101
Product Quantity (lbs): 5000
Component: Methanol

Other Transportation Information: The DOT Transport Information may vary with the container and mode of shipment.

15. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA (Toxic Substance Control Act) Status
TSCA (United States) The intentional ingredients of this product are listed.

CERCLA RQ (Comprehensive Environmental Response Compensation and Liability Act of 1980), 40 CFR 302.4(a):
Component: Methyl Alcohol
RQ (lbs): 5000

SARA (Superfund Amendment and Reauthorization Act) 302 Components – 40 CFR 370.2
None

Section 311/312 Hazard Class - 40 CFR 370.2:

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X
Reactivity Hazard: Sudden Release of Pressure Hazard:

SARA Section 313 Components - 40 CFR 372.65:
Component: Methanol
CAS Number:67-56-1
%: 100

OSHA Process Safety Management – 29 CFR 1910: None listed.

EPA Accidental Release Prevention – 40 CFR 68: None listed.

International Regulations

Inventory Status

AICS (Australia) The international ingredients of this product are listed.
DSL (Canada) The international ingredients of this product are listed.
ECL (South Korea) The international ingredients of this product are listed.
EINECS (Europe) The international ingredients of this product are listed.
ENCS (Japan) The international ingredients of this product are listed.
IECSC (China) The international ingredients of this product are listed.
PICCS (Philippines) The international ingredients of this product are listed.

State and Local Regulations

California Proposition 65: None.
New Jersey RTK Label Information: Methyl Alcohol 67-56-1
Pennsylvania RTK Label Information: Methanol 67-56-1

16. OTHER INFORMATION

Disclaimer

Information contained in this publication, while accurate to the best of the knowledge and belief of Purification Technologies, Inc., is not intended and should not be construed as a warranty or representation for which Purification Technologies, Inc. assumes legal responsibility.

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Material Safety Data Sheet
(MSDS-HCL)

PRODUCT IDENTIFICATION	
Product Name	Hydrochloric Acid Solution 20 Deg. Be – 31.5% 22 Deg. Be – 35.2%
Trade Names and Synonyms	Hydrogen Chloride (Aqueous) Muriatic Acid
Manufacturer/Distributor	Trans Chem, Inc. 1259 Safe Energy Dr. Port Allen, Louisiana 70767 (225) 389-9133 Various others
Transportation Emergency	**800-255-3924 (24 hrs -- *CHEM • TEL*)**

HAZARDOUS COMPONENTS			
Material or Component	**CAS No.**	**TLV**	**PEL**
Hydrochloric Acid	7647-01-0	7mg/m^3	5PPM
N/A = Not assigned NE = Not established			

PHYSICAL DATA	
Boiling Point	127° F
Vapor Pressure	24mm Hg – 20 Deg. Be 100mm Hg – 22 Deg. Be
Solubility in Water	Complete
Specific Gravity	1.16 @ 15.5° C 20 Deg. Be 1.1789 @ 15.5° C 22 Deg. Be
Melting Point	N/A
Vapor Density	Similar to Water
Evaporation Rate	Not Applicable
Appearance and Odor	Clear Colorless to Yellowish Fuming Liquid, Pungent and Irritating

HAZARDOUS REACTIVITY

Stable under ordinary conditions of use and storage. Does not polymerize. Incompatible with aluminum and aluminum alloys, carbon steel, copper and copper alloys, and nylon. Hydrogen gas will be formed if acid contacts metal.

FIRE AND EXPLOSION DATA	
Flashpoint	Not Flammable
Extinguishing Media	Use any means suitable for extinguishing surrounding fire.
Decomposition Products	Contact with most metals may produce Hydrogen gas to potentially explosive limits.
Unusnal Explosion	Containers may explode when heated. Consult the 2000 Emergency Response Guidebook, Guide 157 for further details.

HEALTH HAZARDS / FIRST AID	
Inhalation	Inhalation causes severe irritation of upper respiratory tract. FA: Remove person to to fresh air. If not breathing, give artificial respiration. Call physician.
Ingestion	CORROSIVE ! Ingestion of Hydrochloric Acid can cause burns of the mouth, throat, esophagus and gastrointestinal tract. FA: DO NOT INDUCE VOMITING. Give large quantities of water or milk of magnesia. Never give anything by mouth to an unconscious person. Get immediate medical attention.
Skin Contact	CORROSIVE ! Can cause redness, pain and skin burns. Can cause some tissue destruction. FA: Immediately flush with water.
Eye Contact	CORROSIVE ! FA: Continuously flush eyes with large amounts of water for at least 20 minutes. If irritation continues, seek medical attention.

SPILL OR LEAK PROCEDURES	
Spill/leak	In the event of a spill or leak, keep upwind. Ventilate enclosed areas until spill or leak is contained, neutralized and prepared for removal.
Waste disposal	Disposal of waste material or residue may be subject to federal, state, or local regulation. Before transporting waste material see 49 CFR 172.

SPECIAL PROTECTION INFORMATION	
Ventilation	Use only in areas with adequate ventilation.
Eye Protection	Use chemical safety goggles, plus a safety shield is recommended. Contact lenses should not be worn when working with this material.
Skin Protection	Wear impervious protective clothing; i.e., Boots, Gloves, Lab Coat, Apron or Coveralls to prevent skin contact.
Other	If working in an area of potential exposure, use an NIOSH approved respirator when material is fuming and exceeds the TLV.

STORAGE CONDITIONS
Store and handle only in containers suitably lined with or constructed of materials specified, by the manufacturer, for the product. Protect against physical damage. Keep separated from incompatible materials.

REGULATORY INFORMATION	
Proper shipping name	Hydrochloric acid
Hazard class	8
UN Number	UN1789
DOT Label & Placard	Corrosive
NFPA / HMIS Ratings	Health – 3; Flammability – 0; Reactivity – 0
SARA Title III	Reporting Sections 302, 311 & 313

The information contained in this Material Safety Data Sheet is based upon available data and believed to be correct; however, as such has been obtained from various sources, including the manufacturer and independent laboratories, it is given without warranty or representation that it is complete, accurate, and can be relied upon. *OWEN COMPLIANCE SERVICES, INC.* has not attempted to conceal in any manner the deleterious aspects of the product listed herein, but makes no warranty as to such. Further, *OWEN COMPLIANCE SERVICES, INC.* cannot anticipate nor control the many situations in which the product or this information may be used; there is no guarantee that the health and safety precautions suggested will be proper under all conditions. It is the sole responsibility of each user of the product to determine and comply with the requirements of all applicable laws and regulations regarding its use. This information is given solely for the purposes of safety to persons and property. Any other use of this information is expressly prohibited.

For further information contact:	David W. Boston, President	
	OWEN COMPLIANCE SERVICES, INC.	
	12001 County Road 1000	
	P.O. Box 765	
	Godley, TX 76044	
	Telephone number:	817-551-0660
	FAX number:	817-396-4584
MSDS prepared by:	Allen M. Sweeney	
	Original publication date:	8/5/1999
	Revision date	10/27/06

APG

Analytical Products Group, Inc.

2730 Washington Blvd., Belpre, OH 45714
740-423-4200 800-272-4442 Fax 740-423-5588

Material Safety Data Sheet

Date prepared on: 6/14/01

Last revised on: 1/20/08

Page 1

Section I: Product Identification

CATALOG NUMBER: 5380, 5382	PRODUCT NAME: Benzo(a)pyrene

Section II - Hazardous Ingredients/Identity Information

Chemical Name	CAS Reg. No.	OSHA PEL (TWA)	% Composition*
Acetone	67-64-1	750ppm	>99%
Benzo(A) Pyrene	50-32-8	0.2Mg/M3	<0.1%
A table of the compound possible in this polynuclear aromatic hydrocarbon analytical standard is attached. Data included in the table are formulas, CAS numbers, oral ld50 values for rats and PEL/TWA values if available. .			

Section III - Physical/Chemical Characteristics of Hazardous Ingredients

BOILING POINT: 56 C (132 F) @ 760 mm Hg	SPECIFIC GRAVITY: 0.79 (water=1)	
VAPOR PRESSURE: 181 (20 C)	SOLUBILITY IN WATER: Complete	APPEARANCE/ODOR: Clear, colorless liquid, sweet odor (acetone).

Section IV - Fire and Explosion Hazard Data

FLASH POINT (Method used): -18 C (-2 F)	AUTO IGNITION TEMPERATURE: 464 C (869 F)	FLAMMABLE LIMITS	LEL 2.5%	UEL 13%
EXTINGUISHING MEDIA: Use alcohol foam, dry chemical or carbon dioxide (water may be ineffective). Use extinguisher media appropriate for surrounding fire.				
SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire exposed containers cool.				
UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause a fire.				

Section V - Reactivity Data

STABILITY:	Unstable ☐	Stable ☒	Conditions to Avoid: Heat, flame, other sources of ignition.
INCOMPATIBILITY (Materials to avoid): Strong oxidizing agents, strong bases, halogen acids and halogen compounds, caustics, amines and ammonia, chlorine and chlorine compounds, strong acids esp. sulfuric and nitric.			
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, toxic fumes of chlorine.			
HAZARDOUS POLYMERIZATION:	May Occur ☐	Will Not Occur ☒	Conditions to Avoid: None Known

Section VI - Health Hazard Data

ROUTES OF ENTRY	Inhalation? YES	Skin? YES	Ingestion? YES
HEALTH HAZARDS (Acute and Chronic): ACUTE: Irritation of the nose and throat. CHRONIC: Kidney and liver damage.			
COMPONENTS LISTED AS CARCINOGENS OR POTENTIAL CARCINOGENS: Total of PAH is less than 1%. Some are on the IARC list.			
SIGNS AND SYMPTOMS OF EXPOSURE: Irritation of skin, eyes, nose and throat. Headache, dizziness, vomiting, nausea, central nervous system depression, low			

blood pressure and respiratory failure. Prolonged contact may cause dermatitis.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Skin and eye disorders, chronic respiratory disease.
EMERGENCY AND FIRST AID PROCEDURES: Seek medical assistance for treatment, observation and support if necessary. EYE CONTACT: Flush with water, seek medical attention.   SKIN CONTACT: Wash with soap and water, use protective creams.   INHALATION: Remove to fresh air, if not breathing give artificial respiration. If breathing is difficult give oxygen and obtain medical assistance.   INGESTION: Obtain medical assistance if swallowed. If conscious give large amounts of water and induce vomiting.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Diluted standard can be absorbed with sand or other non-combustible absorbent material and placed into a container for later disposal. Sample solutions should be absorbed with charcoal or other organic absorbent and incinerated. Flush area with water.
WASTE DISPOSAL METHOD: Dispose in accordance with all applicable federal, state and local regulations.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep container tightly closed. Store in a cool, dry, well ventilated flammable liquid storage area. Isolate from incompatible materials.
OTHER PRECAUTIONS* Do not heat or evaporate analytical standards to dryness.

Section VIII - Control Measures

RESPIRATORY PROTECTION (Please specify): Respiratory protection required if airborne concentrations exceeds PEL (750 ppm). At concentrations up to 5000 ppm a chemical cartridge respirator with organic vapor cartridge is recommended. Above this level, a self-contained breathing apparatus is recommended. (20,000 is immediately dangerous to life or health).	
VENTILATION: Local exhaust	
PROTECTIVE GLOVES: Butyl, neoprene, latex, or rubber gloves.	EYE PROTECTION: Safety glasses or goggles.
OTHER PROTECTIVE EQUIPMENT: Impervious Clothing.	
EMERGENCY WASH FACILITIES: Maintain eye wash and quick drench showers in work area.	

The information stated in this Material Safety Data Sheet (MSDS) is believed to be correct on the date of publication and must not be considered all conclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. Persons not specifically and properly trained should not handle this chemical or its container. This MSDS is provided without any warranty expressed or implied, including merchantability or fitness for any particular purpose.

This product is furnished for laboratory use ONLY! Our standards may not be used as drugs, cosmetics, agricultural or pesticidal products, food additives or as house hold chemicals.

* Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Environmental Protection Agency, and others) may have specific regulations concerning the transportation, handling, storage or use of this product which may not be contained herein. The customer or user of this product should be familiar with these regulations.

Chemical Name	Common Name	Percentage	CAS#	Formula	PEL(Units)	ILV(Units)	LD50 Value	Conditions	Footnote
Acetone	Acetone	>98.0	67.-64-1	CH3COC	750ppm	750ppm	5800	Mg/Kg Oral Rat	2
Benzo (A) Pyrene	Benzo (A) Pyrene	<0.1	50-32-8	C20H12	0.2 Mg/M3	ALARA	Not Available		1

HAZARDOUS COMPONENTS OF POLYNUCLEAR AROMATIC HYDROCARBONS S

1. Classified by IARC as a Class 2A Carcinogen
2. Subject to the reporting requirements of SARA Title III, Section 313

SAFETY DATA SHEET

VINYL CHLORIDE (MONOMER)

MSDS No.: M9192 **Rev. Date:** 2009-Oct-07 **Rev. Num.:** 02

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 5005 LBJ Freeway P.O. Box 809050 Dallas, Tx 75380-9050
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (U.S.); 32.3.575.55.55 (Europe); 1800-033-111 (Australia)
To Request an MSDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Synonyms:	VCM, Monochloroethylene, Chloroethene, Ethylene, chloro-, Vinyl chloride monomer
Product Use:	PVC Manufacturing

2. HAZARDS IDENTIFICATION

****

EMERGENCY OVERVIEW:

Color:	Colorless
Physical State:	Compressed, liquefied gas
Odor:	Sweet
Signal Word:	DANGER

MAJOR HEALTH HAZARDS: LIQUID MAY CAUSE FROSTBITE TO EYES AND SKIN. MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS. CONTAINS VINYL CHLORIDE, A KNOWN HUMAN CANCER AGENT. CAUSES DAMAGE TO LIVER AND PERIPHERAL NERVOUS SYSTEM THROUGH PROLONGED OR REPEATED EXPOSURE. CAUSES DAMAGE TO LUNGS THROUGH PROLONGED OR REPEATED EXPOSURE BY INHALATION. SUSPECTED OF CAUSING GENETIC DEFECTS. REPRODUCTIVE HAZARD.
PHYSICAL HAZARDS: Extremely flammable gas under pressure.
PRECAUTIONARY STATEMENTS: Keep away from heat, sparks and flame. Wash thoroughly after handling. Avoid contact with eyes, skin and clothing. Do not breathe vapors or spray mist. Do not eat, drink or smoke in areas where this material is used. Use only outdoors or in a well-ventilated area. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Store in well-ventilated place. Keep container tightly closed.

****

POTENTIAL HEALTH EFFECTS:

Inhalation: Several minutes of exposure to high, but attainable concentrations (over 1000 ppm) may cause central nervous system depression with effects such as dizziness, drowsiness, disorientation, tingling, numbness or burning sensation of the hands and feet, impaired vision, nausea, headache, difficulty breathing, cardiac arrhythmias, unconsciousness, or even death.

Skin contact: May cause irritation. Rapid evaporation of the material may cause frostbite.

Eye contact: May cause irritation. Rapid evaporation of the material may cause frostbite.

Ingestion: Not a likely route of exposure.

Chronic Effects: Causes damage to the liver, musculoskeletal system, and peripheral nervous system through prolonged or repeated exposure.

Interaction with Other Chemicals Which Enhance Toxicity: Alcohol may enhance toxic effects

Medical Conditions Aggravated by Exposure: Hepatitis B infection

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percentage	CAS Number
Vinyl chloride	99 - 100	75-01-4

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, have a trained person administer basic life support (Cardio-Pulmonary Resuscitation and/or Automatic External Defibrillator) and CALL FOR EMERGENCY SERVICES IMMEDIATELY.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (100-105 F, 38-41 C). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT: Immediately flush eyes with a directed stream of water for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissues. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION: Not a likely route of exposure.

Notes to Physician: Cardiac stimulants such as epinephrine should not be given to persons overexposed to chlorinated hydrocarbons.

5. FIRE-FIGHTING MEASURES

Fire Hazard: Severe fire hazard. Vapor/air mixtures are explosive. Vapors or gases may ignite at distant sources and flash back. Containers may rupture or explode if exposed to heat.

Extinguishing Media: Stop flow of gas before extinguishing fire. Use carbon dioxide, regular dry chemical, foam or water. Use water spray to keep containers cool.

Fire Fighting: Move container from fire area if it can be done without risk. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this can't be done, then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode.

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Electrostatic charges may build up during handling and may form ignitable vapor-air mixtures in storage containers. Ground equipment in accordance with industry standards and best practices such as NFPA 77 [Recommended Practices on Static Electricity (2007)] and American Petroleum Institute (API) RP Recommended Practice 2003 [Protection Against Ignitions Arising our of Static, Lightning, and Stray Currents (2008)].

Lower Flammability Level (air):	3.6 %
Upper Flammability Level (air):	33.0 %
Flash point:	-108 F (-78 C)
Autoignition Temperature:	882 F (472 C)

Hazardous Combustion Products: Oxides of carbon, Hydrogen chloride, Phosgene

6. ACCIDENTAL RELEASE MEASURES

Occupational Release:
Remove sources of ignition. Ventilate closed spaces before entering. Stop leak if possible without personal risk. Vapors or gases may ignite at distant ignition sources and flash back. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Keep out of water supplies and sewers. Wear appropriate personal protective equipment recommended in Section 8 of the SDS. Releases should be reported, if required, to appropriate agencies.

7. HANDLING AND STORAGE

Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Store in a cool, dry area. Store in a well-ventilated area. Do not enter confined spaces unless adequately ventilated. Avoid heat, flames, sparks and other sources of ignition. May be subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Keep separated from incompatible substances (see Section 10 of SDS).

7. HANDLING AND STORAGE

Handling Procedures: Avoid breathing vapor or mist. Avoid contact with skin, eyes and clothing. Keep away from heat, sparks and flame. Ground any equipment used in handling. Use non-sparking tools and equipment. All energized electrical equipment must be designed in accordance with the electrical classification of the area.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Regulatory Exposure limit(s):

Component	CAS Number	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Vinyl chloride	75-01-4	1 ppm	5 ppm	-----

OEL: Occupational Exposure Level; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

Non-Regulatory Exposure Limit(s):

- **The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits shown in the table are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).**
- **The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.**

Component	CAS Number	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Vinyl chloride	75-01-4	1 ppm	-----	-----	-----	-----	-----

ENGINEERING CONTROLS: Use closed systems when possible. Provide local exhaust ventilation where vapor may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear safety glasses with side-shields. If eye contact is likely, wear chemical resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear appropriate chemical resistant clothing.

Hand Protection: Wear appropriate chemical resistant gloves

Protective Material Types: Butyl rubber, Nitrile, Silver Shield®, Viton®

Respiratory Protection: Refer to 29 CFR 1910.1017 for selection of respirators for vinyl chloride. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Compressed, liquefied gas

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	Colorless
Odor:	Sweet
Odor Threshold:	Not reliable to prevent excessive exposure
Molecular Weight:	62.5
Molecular Formula:	C2ClH3
Flash point:	-108 F (-78 C)
Lower Flammability Level (air):	3.6 %
Upper Flammability Level (air):	33.0 %
Boiling Point/Range:	7 F (-14 C)
Freezing Point/Range:	No data available
Vapor Pressure:	2660 mmHg @ 25 C
Vapor Density (air=1):	2.15
Specific Gravity (water=1):	0.91 @ 25/25 C
Water Solubility:	2.7 g/L
pH:	Not applicable
Volatility:	100%
VOC Content(%):	100%
Evaporation Rate (ether=1):	>15
Partition Coefficient (n-octanol/water):	Log Kow = 1.36

10. STABILITY AND REACTIVITY

Reactivity/ Stability:	Stable at normal temperatures and pressures.
Conditions to Avoid:	Avoid air and sunlight. Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.
Incompatibilities/ Materials to Avoid:	Oxidizing agents, Oxides of nitrogen, Metals, Aluminum, Aluminum alloys, Copper, Metal alkyl complexes and alkali metals such as sodium, potassium and their alloys
Hazardous Decomposition Products:	Oxides of carbon, Chlorine, Hydrogen chloride, Phosgene
Hazardous Polymerization:	Polymerization can occur. Avoid elevated temperatures, oxidizing agents, oxides of nitrogen, oxygen, peroxides, other polymerization catalysts/initiators, air and sunlight.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA:

Component	LD50 Oral	LC50 Inhalation	LD50 Dermal
Vinyl chloride	500 mg/kg (Rat)	-----	-----

CHRONIC TOXICITY: Occupational overexposure has produced a specific cancer (angiosarcoma of the liver) and is associated with hepatocellular cancer. Occupational exposure has also resulted in changes in bones and skin, especially in the extremities such as the fingers (acroosteolysis). Additionally, repeated exposure may result in dose-related sensory disorders, peripheral nervous system effects, blood system damage, lymphatic system changes, liver malfunction, and pulmonary insufficiency.

CARCINOGENICITY: This material is classified as follows:

Component	NTP:	IARC (GROUP 1):	IARC (GROUP 2):	OSHA:
Vinyl chloride	Known Carcinogen	Group 1	Not listed	Listed

MUTAGENIC DATA: Mutagenic in bacteria studies. Genetic studies in animals were negative in some cases and positive in others.

REPRODUCTIVE TOXICITY: Reproductive effects and testes damage occurred in rats exposed to vinyl chloride. These endpoints, however, were generally noted at concentrations greater than those necessary to cause liver damage.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity:
This material is believed to be practically non-toxic to fish on an acute basis (LC50>100 mg/L)

FATE AND TRANSPORT:

BIODEGRADATION: Vinyl chloride may degrade under anaerobic conditions.

PERSISTENCE: Tropospheric half-life is estimated to be 23 hours. If released to air, this material will remain in the gas phase. If released to soil, volatilization will occur, but material that does not volatilize may be highly mobile. If released to water, evaporation will occur.

BIOCONCENTRATION: Bioconcentration potential is low (BCF <100 or log Kow <3).

13. DISPOSAL CONSIDERATIONS

Reuse or reprocess, if possible. Dispose in accordance with all applicable regulations. May be subject to disposal regulations: U.S. EPA 40 CFR 261. Hazardous Waste Number(s): D001, U043.

14. TRANSPORT INFORMATION

U.S.DOT 49 CFR 172.101:

PROPER SHIPPING NAME:	Vinyl chloride, stabilized
UN NUMBER:	UN1086
HAZARD CLASS/ DIVISION:	2.1
LABELING REQUIREMENTS:	2.1
DOT RQ (lbs):	RQ 1 Lbs. (Vinyl chloride)

14. TRANSPORT INFORMATION

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Vinyl chloride, stabilized
UN NUMBER: UN1086
CLASS OR DIVISION: 2.1

15. REGULATORY INFORMATION

U.S. REGULATIONS

- **OSHA REGULATORY STATUS:** This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) (US)

- **CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):** If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	CERCLA Reportable Quantities:
Vinyl chloride	1 lb (final RQ)

- **EPCRA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):** Not regulated

- **EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.21):** Fire Hazard, Reactive Hazard, Sudden Release of Pressure, Acute Health Hazard, Chronic Health Hazard

- **EPCRA SECTION 313 (40 CFR 372.65):** The following chemicals are listed in 40 CFR 372.65 and may be subject to Community Right-to Know Reporting requirements

Component	Status:
Vinyl chloride	Listed

- **OSHA SPECIFICALLY REGULATED SUBSTANCES:** OSHA 29 CFR 1910.1017 (Vinyl chloride); The U.S. Department of Labor, Occupational Safety and Health Administration specifically regulates manufacturing, handling and processing of vinyl chloride. Such regulations have been published at 29 CFR 1910.1017.

- **OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):** The PSM standard may apply to processes which involve a flammable liquid or gas in a quantity of 10,000 pounds (4535.9 kg) or more.

NATIONAL INVENTORY STATUS

- **U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):** All components are listed or exempt

- **TSCA 12(b):** This product is not subject to export notification

- **Canadian Chemical Inventory:** All components are listed

STATE REGULATIONS

Component	Vinyl chloride
California Proposition 65 Cancer WARNING:	Listed
Massachusetts Right to Know Hazardous Substance List	Listed

	New Jersey Right to Know Hazardous Substance List	Listed	
	New Jersey Special Health Hazards Substance List	Listed	a
	New Jersey - Environmental Hazardous Substance List	Listed	
	Pennsylvania Right to Know Hazardous Substance List	Listed	
	Pennsylvania Right to Know Special Hazardous Substances	Listed	
	Pennsylvania Right to Know Environmental Hazard List	Listed	
	Rhode Island Right to Know Hazardous Substance List	Listed	

CANADIAN REGULATIONS
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: A, B1, D2A, D2B, F

16. OTHER INFORMATION

Prepared by: OxyChem Corporate HESS - Health Risk Management

HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS: Rating Instructions, 2nd Edition)
Health: 2* **Flammability:** 4 **Reactivity:** 2
NFPA 704 - Hazard Identification Ratings (SCALE 0-4)
Health: 2 **Flammability:** 4 **Reactivity:** 2

IMPORTANT:
The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and OxyChem assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws.

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

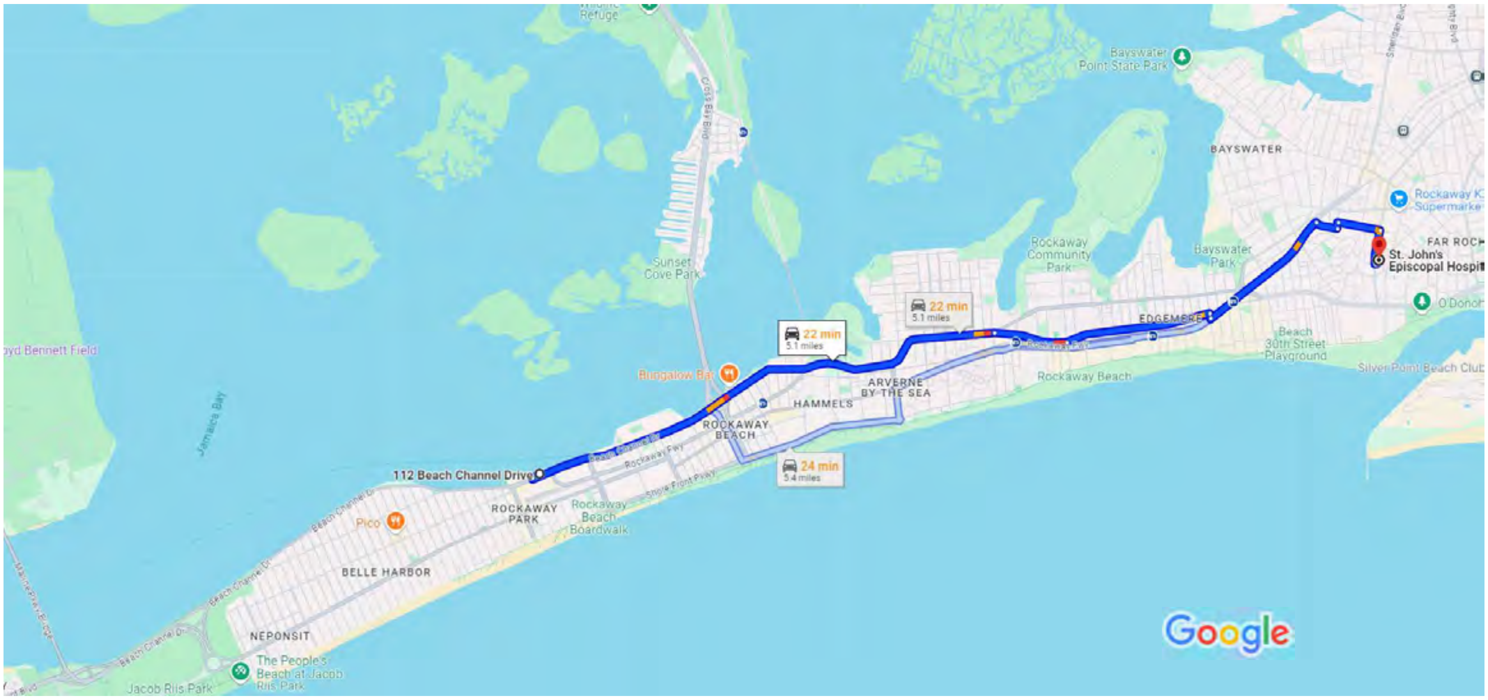
APPENDIX D

Directions and Map to Emergency Medical Facility

Google Maps

112 Beach Channel Dr, Rockaway Park, NY 11694 to St John's Episcopal Hospital Emergency Room, 327 Beach 19th St, Far Rockaway, NY 11691

Drive 5.1 miles, 22 min



Map data ©2024 Google 2000 ft

112 Beach Channel Dr
Rockaway Park, NY 11694

Follow Beach Channel Dr to Arverne Blvd

10 min (2.6 mi)

1. Head southwest on Beach Channel Dr

226 ft

2. Make a U-turn

   Pass by Citi (on the right)

2.6 mi

Take Rockaway Beach Blvd to Rockaway Fwy

4 min (1.2 mi)

3. Turn right onto Arverne Blvd

0.4 mi

4. Continue onto Rockaway Beach Blvd

0.7 mi

5. Turn right onto Beach 38th St

128 ft

6. Turn left at the 1st cross street onto Rockaway Fwy

3 min (0.7 mi)

Take New Haven Ave to Beach 20th St

2 min (0.4 mi)

7. Turn right onto Ocean Crest Blvd

0.1 mi

8. Turn left onto Grassmere Terrace

174 ft

9. Turn right onto New Haven Ave

0.2 mi

10. Turn right onto Beach 20th St

1 min (0.2 mi)

11. Turn left onto Elk Dr

26 sec (128 ft)

St John's Episcopal Hospital Emergency Room
327 Beach 19th St, Far Rockaway, NY 11691

APPENDIX E

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN
for

Belle Harbor Shopping Center
112-15 Beach Channel Drive, Queens (Far Rockaway), NY
NYSDEC Site No. #241048

Prepared for:

Ahold U.S.A., Inc.
1385 Hancock Street
Quincy, MA

Prepared by:

Stantec Consulting Services, INC.

February 2025

QUALITY ASSURANCE PROJECT PLAN
for
Belle Harbor Shopping Center
112-15 Beach Channel Drive, Queens (Far Rockaway), NY
NYSDEC Site No. #C241048

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FOR THE
Belle Harbor Shopping Center
112-15 Beach Channel Drive, Queens (Far Rockaway), NY
NYSDEC Site No. #241048

1.0 INTRODUCTION

From December 2011 to March 2024, Stantec Consulting Services Inc. (Stantec) conducted subsurface field investigation work at the Belle Harbor Shopping Center, located at 112-15 Beach Channel Drive in Queens (Far Rockaway), New York (the “Site” or “property”). The investigation work was conducted in general accordance with Stantec’s Supplemental Remedial Investigation Work Plan (SRIWP), dated May 26, 2011, that was approved by the New York State Department of Environmental Conservation (NYSDEC) on July 15, 2011.

The supplemental investigation work consisted of soils borings, soil sampling, monitoring well installation, groundwater sampling, and sub-slab soil gas and indoor air sampling. The work was conducted in accordance with the SRIWP, and the Quality Assurance Project Plan (QAPP) that was presented in the SRIWP as Chapter 3, for sampling at both interior lease units and exterior locations at the shopping center. In December 2011, Stantec also conducted interim remedial measures within one of the lease units known as the former Bell Boy Cleaners. These remedial measures consisted of excavating impacted soils underlying the concrete slab, installing a sub-slab depressurization system (SSDS), and performing post-installation monitoring and testing. The remedial measures were implemented, and this particular lease unit was subsequently renovated into the current retail business of Sofia’s Nail Salon.

The supplement remedial investigation work was conducted in two general areas of the Site. In the western portion of the Site, Stantec oversaw the work to evaluate the nature and the extent of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in soils, groundwater, and soil vapor. The primary contaminants of concern (COCs) in this area of the site are chlorinated VOCs (cVOCs) apparently related to dry cleaning operations that were formerly conducted at the Site.

In the southeastern portion of the Site, GEI Consultants, P.C. (GEI working for National Grid) oversaw work to evaluate the nature and the extent of impacts to soils, groundwater, and soil vapor related to Manufactured Gas Plant (MGP) waste material that is apparently from a former MGP site under remediation located just east of the property. The primary COCs in this area of the Site are polycyclic aromatic hydrocarbons (PAHs) and complexed cyanide related to the MGP waste material.

In February 2018, Stantec, on behalf of Ahold U.S.A., Inc, (Ahold) submitted a Remedial Investigation Report (RIR) for the entire Site for NYSDEC review and comment. On July 12, 2018, Stantec and Ahold received a letter from NYSDEC related to collecting groundwater samples and submitting a revised QAPP for 1,4-dioxane (1,4-D) and per- and poly-fluoroalkyl substances (PFAS). These chemicals are identified as emerging contaminants. This revised QAPP, submitted by Stantec in August 2018, was subsequently reviewed by NYSDEC with minor comments in July 2019. A revised QAPP was subsequently submitted by Stantec in August 2019. Results of the groundwater sampling, which was conducted in August 2020, were submitted in a draft Remedial Investigation Report (draft RIR) in August 2021. NYSDECs review of this draft RIR included requests for additional data tables and additional soil and groundwater samples for TAL Metals including Mercury, TCL SVOCs, PCBs, Pesticides, Herbicides, and emerging contaminants (i.e., PFAS and 1,4-dioxane). The latter request was related to the Site's approval into the Brownfields Cleanup Program (BCP) and required submittal of a draft Supplemental Remedial Investigation Workplan (SRIWP). Stantec submitted the SRIWP, which contained Quality Assurance Project Plan descriptions of sampling activities and various quality methods and assurance tables, in December 2022. Based on NYSDEC comments the SRIWP was subsequently revised in November 2023. Based on their review, NYSDEC required, in an email dated September 19, 2024, that a detailed QAPP including QAPP for the emerging contaminants be developed, or provided, as an appendix to the SRIWP.

Stantec has therefore modified the QAPPs referenced above to create this standalone document. This QAPP was developed by Stantec on behalf of Ahold and has been revised to include the protocols and procedures that will be implemented during soil and groundwater quality sampling for TAL Metals including Mercury, TCL SVOCs, PCBs, Pesticides, Herbicides, PFAS and 1,4-D, and soil gas sampling for VOCs.

2.0 PROJECT SCOPE AND GOALS

The scope of work outlined in the 2025 SRIWP includes the sampling of soil, groundwater, indoor air, and soil vapor at the subject Site. The goals of this work are listed below.

1. Completing the investigation of the extent of contaminants in soils and groundwater;
2. Confirm that no other significant source of chlorinated hydrocarbon contamination exists on site;
3. Understanding contaminant mitigation pathways and groundwater flow dynamics;
4. Evaluating the potential for significant vapor intrusion into existing buildings;
5. Understanding the relationship or separation between detected releases from the identified Areas of Concern;
6. Utilizing data to develop a RAWP
7. Move toward closure of environmental issues under the Brownfield Cleanup Program; and

2.1 Project Organization

Stantec has assembled a project team for this investigation that includes engineers, hydrogeologists, scientists, and subcontractors to include a contaminant transport modeling specialist, data quality reviewer, and geologist. The project organization involves the following Stantec staff and subcontractors:

- Project Manager: Don Moore, Qualified Environmental Professional
- Senior Review: Alex DeNadai, P.E., PMP, LEED AP
- Senior Technical Reviewer: Craig Gendron, P.E., P.G. LSRP
- Quality Assurance Officer – (DUSR): Beth Crowley (Chemist)
- Health & Safety Officer: Don Moore
- Task Manager: Don Moore, P.G. (Hydrogeologist)
- Remedial Technology Specialist: Angus McGrath, Ph.D.

  (Resumes are provided in Appendix C of the 2025 SRIWP)
- Laboratory Services: Eurofins/Test America Services, Inc. (soil and groundwater) and Pace analytical Services (soil gas) – New York State Accredited [National Environmental Laboratory Accreditation Conference (NELAC)].
- Drilling Subcontractor: To be determined and as needed.
- NY Licensed Surveyor: To be determined and as needed.

3.0 SAMPLING PROCEDURES

The sampling procedures for the media of concern (soil, groundwater, and vapor) for the contaminants of concern (VOCS, TAL Metals, SVOCs, PCBs, PCBs, Pesticides, Herbicides, PFAS and 1,4-D) are outlined below.

Based on previous site investigations, there are no anticipated light non-aqueous-phase liquid (LNAPL) conditions on, or off, the property associated with the release area. Previous investigations, however, have indicated dense non-aqueous phase liquid (DNAPL) conditions in a well identified as MW-1 located in the southeastern portion of the property. Field procedures for the collection of groundwater samples collected from the area of investigation will note observations of LNAPL and/or DNAPL if encountered.

3.1 Soil Borings

Stantec will oversee soil borings that will be advanced at nine locations These are identified as B-201 to B-209 on Figure 3A. Five borings (B-201 to B-205) well be located in close proximity to historical borings that had concentrations of COCs above Soil Cleanup Objectives. These historical borings are listed below.

- MW-102 (6.6 – 7.2'),
- MW-103 (5.2 – 6.2'),
- MW-104 (6.3 – 6.9'),
- MW-105 (5.0 – 5.8').
- MW-109 (7 – 9'), and
- MW-1/B-104 (9 – 10').

These depth intervals will be the target depths for the proposed soil sampling at B-201 to B-205 described below.

Prior to drilling at each planned location, the asphalt surface will be cored with an anchored concrete coring unit, hand-held hammer drill, saw, or equivalent. Each boring will be hand cleared to five feet to further assess underground utility conflicts. Each boring will then be advanced with a Geoprobe® rig to five feet below the field-encountered water table. Soil samples will be collected continuously using acetate sleeves and screened for visual/olfactory/photoionization detector (PID) evidence of impacts and characterized for soil classification.

Each sleeve will be placed on and flat surface and carefully cut open and measured. The exposed soils will be screened with the PID and the selected interval will be collected for VOC analysis using Encore samplers. The remaining soils from the selected interval will be placed in Ziploc bags and mixed and then placed in the laboratory provided sample jars.

Based on visual, olfactory, and PID observations, two soil samples (one shallow and one deep) will be collected at each boring for the laboratory analyses listed below. Although the target depths (based on, and consistent with, previous work) are shown below, the collected soil samples will be based on visual/olfactory/PID readings.

- B 201 5.0 – 6.0 ft bls
- B-202 6.5 – 7.5 ft bls
- B-203 6.0 – 7.0 ft bls
- B-204 7.0 – 9.0 ft bls
- B-205 9.0 – 10.0 ft bls

To evaluate soil quality conditions in the uninvestigated far western area of the Site, Stantec will oversee four additional borings at locations identified as B-206 to B-209 on Figure 3A. These borings will also be advanced with a Geoprobe® rig to five feet below the field-encountered water table. Soil samples will be collected continuously and screened for visual/olfactory/PID evidence of impacts and characterized for soil classification as described above. Based on the visual, olfactory, and PID observations, two soil samples (one shallow and one deep) will be collected at each boring for the laboratory analyses listed below. At the current time, shallow and deep target depths are unknown for B-206 to B-209.

The two samples from the B-201 to B-209 borings will be sent to a state-certified laboratory for the analyses listed below. Additional details are presented in Tables 1-3.

- TCL VOCs by USEPA SW-846 Method 8260D;
- TCL SVOCs by USEPA SW-846 Method 8270E;
- TAL metals by USEPA SW-846 Method 6010 and mercury by Method 7471;
- PCBs by USEPA SW-846 Method 8082 following Soxhlet Extraction procedure;
- Pesticides and Herbicides by USEPA SW-846 Method 8081B;
- per- and poly-fluoroalkyl substances (PFAS) by USEPA method 1633 (list of 40 compounds); and
- 1,4-dioxane by USEPA Method 8270.

After the Geoprobe borings for B-206 to B-209 are completed, the boreholes will be re-drilled with hollow stem augers in order to construct 2-inch diameter PVC monitoring wells.

To confirm the levels of VOCs detected in the 2015 Geoprobe® borings, advanced in the vicinity of the 2008 HRC© injection area, Stantec will oversee two additional borings at two locations identified as GP-6 and GP-8. These two borings had concentrations of CVOCs reported above SCOs at the following locations/depths:

- GP-6 (2.5 – 2.7’), and
- GP-8 (2.1 – 2.3’).

These depth intervals will be the target depths for the proposed soil sampling. Due to the shallow sampling intervals, hand clearing will be conducted to only two feet. Each boring will then be advanced with a Geoprobe® rig. Soil samples will be collected continuously to five feet below the water table and screened for visual/olfactory/PID evidence of impacts and characterized for soil classification. One soil sample will be collected at each boring for laboratory analysis of TCL VOCs from the target depth listed above. Soil samples will also be collected at deeper intervals (based on visual, olfactory, and PID observations) for TCL VOCs as a means to delineate vertical impacts.

Soil samples from the GP-6 and GP-8 locations will be analyzed for

- TCL VOCs by USEPA SW-846 Method 8260D;

The laboratory results will be presented in NYS Category B data deliverable format and subsequently submitted to a third party for data validation and preparation of a Data Usability Summary Report (see Section 4.0).

The list of 40 PFAS compounds are listed on the following pages.

Parameter	Acronym	CAS
PERFLUOROALKYLCARBOXILIC ACIDS (PFCAs)		
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorononanoic acid	PFNA	375-95-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluorotetradecanoic acid	PFTeDA	376-06-7
PERFLUOROALKYLSULFONIC Acids (PFASs)		
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluoropentanesulfonic acid	PFPeS	2706-91-4
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5
FLUOROTELOMER SULFONIC ACIDS		
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	4:2FTS	757124-72-4
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	6:2FTS	27619-97-2
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	8:2FTS	39108-34-4
PERFLUOROOCTANE SULFONAMIDES (FOSAs)		
Perfluorooctanesulfonamide	PFOSA	754-91-6
N-methylperfluoro-1-octanesulfonamide	NMeFOSA	31506-32-8
N-ethylperfluoro-1-octanesulfonamide	NEtFOSA	4151-50-2
PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS		
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
PERFLUOROOCTANE SULFONAMIDE ETHANOLS		
N-methyl perfluorooctanesulfonamidoethanol	NMeFOSE	24448-09-7
N-ethyl perfluorooctanesulfonamidoethanol	NEtFOSE	1691-99-2

Parameter	Acronym	CAS
PER- and POLYFLUOROETHER CARBOXYLIC ACIDS		
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	
ETHER SULFONIC ACIDS		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA	113507-82-7
FLUOROTELOMER CARBOXYLIC ACIDS		
3-Perfluoropyopyl propanoic acid	3:3FTCA	356-02-5
2H,2H,3H,3H-Perfluorooctanoic acid	5:3FTCA	914637-49-3
3-Perfluoroheptlyl propanoic acid	7:3FTCA	812-70-4

Additional details are presented in Tables 1-3. The laboratory results will be presented in NYS Category B data deliverable format and subsequently submitted to a third party for data validation and preparation of a Data Usability Summary Report (see Section 4.6 of the SRIWP).

3.2 Groundwater Sampling

All twenty-eight (28) site wells will be gauged prior to sampling. Depth to water measurements will be taken from the top of PVC risers and recorded in the field book. The field measurements will be converted into elevations to develop a groundwater flow map.

Each well will be purged and sampled using low-flow sampling techniques in accordance with USEPA Region II guidance document entitled “Groundwater Sampling Procedure, Low Stress (Low Flow) Purging and Sampling.” Purging will be conducted using a peristaltic pump that will be connected to dedicated HDPE tubing within each well. Dedicated silicone tubing for each well will also be used in the peristaltic pump. The monitoring wells will be low-flow purged prior to sampling by evacuating groundwater at a rate between 100 and 250 milliliters per minute until stabilization of the field parameters are measured. Field parameters will include pH, oxidation/reduction potential, dissolved oxygen, specific conductance, temperature, and turbidity. Parameter stabilization is considered to be achieved when three consecutive readings collected at each well volume, are within the following limits:

+/- 0.1 for pH;

+/- 3% for specific conductivity; and

+/- 10% for dissolved oxygen and turbidity.

After purging is complete, groundwater samples will be collected through the dedicated tubing and pump into laboratory-prepared glassware containing appropriate amount of preservative. Samples will be labeled, packaged in ice packs, and delivered to Eurofins under standard chain of custody protocol. For QA/QC purposes appropriate trip blanks, field blanks, and duplicate samples will also be collected to evaluate the reproducibility of the laboratory analytical results. Samples for PFAS will be collected first. An equipment blank will not be necessary due to utilizing dedicated sampling equipment.

Groundwater from all twenty-four existing on-Site wells (MW-1, MW-2, MW-2D, MW-3, MW-4, MW-4D, MW-5, MW-6, MW-8S, MW-8D, MW-101S to MW-110S) and from the four new wells (B-206 to B-209) will be analyzed for the following:

- TCL VOCs by USEPA SW-846 Method 8260; and

Groundwater from six existing select wells (MW-2, MW-3, MW-4, MW-108S, MW-109S, and MW-110S) and the four new wells (B-206 to B-209) will be analyzed for the following:

- TAL metals by USEPA SW-846 Method 6010 and mercury by Method 7471;
- TCL SVOCs by USEPA SW-846 Method 8270D;
- PCBs by USEPA SW-846 Method 8082;
- Pesticides and Herbicides by USEPA SW-846 Method 8081;
- PFAS by USEPA method 1633 (full list of 40 compounds); and
- 1,4-dioxane by USEPA Method 8270 SIM.

Groundwater from six existing wells located in the eastern portion of the Site (MW-1, MW-8S, MW-8D, MW-108S, MW-109S, and MW-110S) will be analyzed for the following.

- Total Cyanide by USEPA Method 9012A.

The 8270D SIM method will achieve a method detection limit (MDL) for 1,4-dioxane of 0.0160 micrograms per liter (µg/l) and a reporting limit of 0.200 µg/l.

The full list of 40 PFAS compounds are listed in Section 3.1 above. EPA Method 1633 is the preferred method to use for groundwater samples due to the ability to achieve 2 ng/L (ppt) reporting limits. The laboratories Standard Operating Procedures and reporting limits for the 40 listed PFAS compounds are presented in Appendix A.

Additional details are presented in Tables 1-3. The laboratory results will be presented in NYS Category B data deliverable format and subsequently submitted to a third party for data validation and preparation of a Data Usability Summary Report (see Section 4.6 of the SRIWP).

3.3 Soil Vapor Probe Sampling

Soil vapor samples will be collected from three newly installed probes SVP-301 to SVP-303 (see Figure 3A) utilizing 2.7-liter summa canisters certified clean by the laboratory. The 2.7-liter canisters will limit the need for the laboratory to dilute the samples and will allow for lower reporting limits. Disposable polyethylene tubing will be attached from the probes to the summa canisters and the samples will be collected over a two-hour sampling interval into pre-evacuated canisters. Before and after each soil vapor sample is collected, differential pressure readings will be recorded at each probe using a micro-manometer to measure/evaluate cross-slab/asphalt pressures. Over the course of the two-hour sampling period, periodic canister vacuum readings will be recorded on Sub-Slab Soil Vapor Sample Collection Logs

The samples will be shipped to the laboratory and analyzed for VOCs by method TO-15.

3.4 Personal Protective Equipment

Disposable nitrile gloves must be worn at all times during sampling setup and sampling activities. Further, a new pair of nitrile gloves shall be donned prior to the following activities at each sample location:

- Handling soil samples.
- Decontamination of re-usable equipment (i.e., water level meter).
- Contact with sample bottles or water containers.
- Insertion of anything into the well (e.g., HDPE tubing, pump, bailer).
- Insertion of silicon tubing into the peristaltic pump.
- Sample collection, at completion of monitoring well purging.
- Insertion of polyethylene tubing from soil vapor probes to summa canisters.
- Handling of any quality assurance/quality control samples including field blanks and equipment blanks.

New gloves shall also be donned after the handling of non-dedicated sampling equipment, contact with non-decontaminated surfaces, or when judged necessary by field personnel.

3.5 Sample Collection Method/Sequence

a. For soils collect the sample for VOCs using an Encore sampler, then the remaining parameters. For groundwater, collect the sample for PFAS first, prior to collecting samples for any other parameters into any other containers; this avoids contact with any other type of sample container, bottles or package materials that may have PFAS related content.

b. Do not place the sample bottle cap on any surface when collecting the sample and avoid all contact with the inside of the sample bottle or its cap.

c. Once the sample is collected, capped and labeled, place the sample bottle(s) in an individual re-sealable plastic bag (e.g., Ziploc®) and place in an appropriate cooler packed only with loose ice (preferably from a verifiable PFAS-free source).

d. PFAS samples will be placed in separate coolers.

3.6 For Samples Collected from Monitoring Wells

a. When feasible, use dedicated HDPE and silicone materials (tubing, bailers, etc.) for monitoring well purging and sampling equipment such as peristaltic pumps.

b. When reuse of materials or sampling equipment across multiple sampling locations is necessary, follow project decontamination protocols with allowed materials in the table below and incorporate collection of equipment blanks (one equipment blank per day) into sampling program, as appropriate.

c. When using positive displacement/submersible pump or bladder pump sampling equipment, familiarize yourself with the sampling pump/accessory equipment specifications to confirm that device components are not made of nor contain polytetrafluoroethylene (PTFE, a.k.a. Teflon®) or other PFAS-containing components.

3.7 Equipment and Materials

The following table provides a summary of items that are likely to contain PFAS (i.e., prohibited items) and that are not to be used by the sampling team at the site, along with acceptable alternatives. This list may change as new information becomes available.

Category	Prohibited Items	Allowable Items
Field Equipment Including: • Pumps • Tubing • Bailers	Teflon and other fluoropolymer containing materials. (e.g., Teflon tubing, bailers, tape, Teflon-containing plumbing paste, or other Teflon materials) **Note**: The Grundfos Redi-Flow Submersible Pump is a submersible pump which, as of this revision, has a Teflon impeller and is not recommended for collecting PFAS samples.	High-density polyethylene (HDPE), or silicone tubing HDPE or stainless-steel bailers Peristaltic pumps Stainless steel submersible pumps (e.g., ProActive stainless-steel pumps with PVC (Polyvinyl chloride) leads and Geotech Stainless Steel Geosub pumps) Bladder pumps with polyethylene bladders and tubing need to be evaluated on a case-by-case basis because the gaskets and O-rings may contain PFAS. Equipment with Viton components needs to be evaluated on a case-by-case basis. Viton contains PTFE but may be acceptable if used in gaskets or O-rings that are sealed away and will not come into contact with sample or sampling equipment.)
Decontamination	Decon 90	Alconox® or Liquinox®[1], potable water followed by laboratory "PFAS-free" deionized water rinse.
Sample Storage and Preservation	glass bottles, PTFE-or Teflon®-lined caps, chemical ice packs	Laboratory-provided sample container - *preferred*; or, HDPE or polypropylene bottles, regular loose ice (preferably from a known PFAS-free source).

Category	Prohibited Items	Allowable Items
Field Documentation	Waterproof/treated paper or field books, plastic clipboards, non-Sharpie® markers, Post-It® and other adhesive paper products.	Plain Paper, metal clipboard, Sharpies® [2], Pens
Clothing/ laundering	Clothing or boots made of or with Gore-Tex™ or other synthetic water proof/ resistant and/or stain resistant materials, coated Tyvek® material that may contain PFAS; fabric softener	Synthetic or cotton material, previously laundered clothing (preferably previously washed greater than six times) without the use of fabric softeners. Polyurethane and wax coated materials. Boots made with polyurethane and PVC, well-worn or untreated leather boots. Tyvek material that is PFAS free
Personal Care Products (for day of sample collection)	Cosmetics, moisturizers, hand cream and other related products	**Suncreens:** Alba Organics Natural Yes to Cucumbers Aubrey Organics Jason Natural Sun Block Kiss My Face Baby-safe sunscreens ('free' or 'natural) **Insect Repellents**: Jason Natural Quit Bugging Me Repel Lemon Eucalyptus Herbal Armor California Baby Natural Bug Spray BabyGanics **Sunscreen and Insect Repellents:** Avon Skin So Soft Bug Guard-SPF 30
Food and Beverage	Pre-packaged food, fast food wrappers or containers	Bottled water or hydration drinks (i.e., Gatorade® and Powerade®)
Shelter	The use of a canopy/gazebo/tent, which can be erected over the sample location to provide shelter, may be considered. Note that the canopy is likely to have a treated surface and must be handled with care due to the potential for cross-contamination. Gloves must be worn when setting up and moving the tent and then changed immediately afterwards. Further contact with the tent must be avoided until all PFAS samples have been collected and properly stored.	

1. While Alconox and Liquinox soap is acceptable for use for PFAS decontamination, they may contain 1,4-dioxane. If Alconox® and Liquinox® soap is used at sites where 1,4-dioxane is a contaminant of concern/interest, then equipment blanks analyzed for 1,4-dioxane will be required. A linear decontamination line will be prepared for the initial PFAS equipment cleaning followed by the 1-4 D equipment cleaning.

2. Sharpies may be used if necessary; however, they are not recommended since they can bleed through pages and smudge, making the documentation hard to read.

4.0 ANALYTICAL PROCEDURES

4.1 Analytical Methods

Soil, groundwater, and vapor will be analyzed using Level III Analytical Support. The selected laboratories shall be a NYS DOH ELAP laboratory. The methodologies for the analyses are summarized in Table 2. The analyses for PFAS will be performed in accordance with Modified EPA Method 1633 as this is the preferred method to use for groundwater samples due to the ability to achieve 2 ng/L (ppt) detection limits and in accordance with New York State ASP protocols. Samples for 1,4-D analysis will be analyzed by EPA Method 8270D SIM (selective ion monitoring).

4.2 Sample Containers, Preservatives and Holding Times

The types of containers used for specified analyses as well as the required preservation and applicable holding times are detailed in Table 3 of this QAPP. All sample containers will be obtained from the subcontracted analytical laboratory. Sample containers will be prepared by the contract lab following the laboratory's quality control procedures in accordance with OSWER Directive No. 9240.0-50A "Specifications and Guidance for Obtaining Contaminant Free Sample Containers ".

4.3 Decontamination

Non-dedicated sampling equipment for soils (knife, trowel, etc.) and groundwater gauging (water level meter) will be used, so decontamination of that equipment will be necessary and therefore an equipment blank will be necessary. Dedicated sampling equipment for groundwater sampling will be used at each well, so decontamination of that equipment will not be necessary and, therefore, an equipment blank for the purge and sampling equipment will not be necessary.

Decontamination using certified PFAS/PFOS free (P-Free) water acquired from the Laboratory will be incorporated into the decontamination procedure. This, or some product similar, will be used in the field along with Alconox. Decontamination will be performed as follows:

- Rinse with potable water;
- Use a bristle brush and potable-water/Alconox® (or an equivalent non-phosphate soap) solution to clean meter;
- Rinse with potable water; and
- Perform a final rinse with P-Free water.

An equipment blank(s) will be collected and analyzed for the parameters listed in Section 3.1 and 3.2. The equipment blank will be collected by pouring laboratory provided water over the reusable equipment and capturing the rinse water into the appropriate containers. One equipment blank will be collected each sampling day.

4.4 Quality Assurance Samples

For quality assurance/quality control purposes (QA/QC), duplicates, field blanks, equipment blanks, and trip blanks will be included in the sampling events. Should non-dedicated (i.e., disposable) sampling equipment be required, one (1) equipment blank will be collected per twenty samples/media.

For the QA/QC samples, the following standalone notation will be used when labeling sample containers and Chain of Custody(s):

- Trip Blank – TB;
- Field Blank – FB;
- Field Duplicates – Instead of using the actual well identifiers, duplicates will be designated by the notation “Dup” followed by a letter starting with A (for the first duplicate). For these duplicate samples the time of collection will be purposely left blank. This method has been established to ensure that the duplicates are submitted as blind samples to the analytical laboratory; and
- Equipment Blank – EB or Equip Blank – one per day.

Table 1 provides a summary of the proposed field and quality assurance samples for the contaminants of concern described in this revised QAPP.

5.0 SAMPLING METHODS AND FIELD MEASUREMENTS

This section of the QAPP outlines the procedures and requirements for sampling of groundwater and for field measurements. A summary of the scope of work for sample collection is included in Section 3.2 of this QAPP. A detailed description of each task procedure is provided in the following Sections of the QAPP.

5.1 Groundwater Monitoring for Field Parameters

Field parameters, including pH, Specific Conductance, Temperature, Oxidation/Reduction Potential, Dissolved Oxygen, and Turbidity will be measured during low flow purging. Two groundwater parameter measurement devices will be used to complete the groundwater sampling task. A YSI 556 or YSI 600 will be used in conjunction with a flow-through cell to measure pH, specific conductance (Sc), temperature, dissolved oxygen (DO), and oxidation/reduction potential (ORP). The instrument will be calibrated at the start of each day to pH (3-point calibration, pH 4.00, pH 7.00, and pH 10.00), Sc (1413 umhos/cm), DO (% saturation with a zero DO check), and ORP (240 mv) as per manufacturer's instructions. Calibration solution lot numbers and expiration dates will be noted in the field book. Turbidity will be measured using a Hach 2100Q turbidity meter. This instrument will be calibrated with different solutions, 20 nephelometric units (NTUs), 100NTUs and 800 NTUs. Once calibration is complete, a calibration check is performed using a 10 NTU solution. The value must be within 95% of the 10 NTU value. Calibration is performed in accordance with the manufacturer's instructions.

5.2 Groundwater Sampling

Sampling will be conducted utilizing low-flow purge and sampling techniques using a peristaltic pump. Dedicated HDPE tubing will set and utilized in each monitoring well. Dedicated silicone tubing for each well will be placed in the peristaltic pump. Low flow purging and sampling will utilize a peristaltic pump. Field parameters, described above, will be measured every five minutes until these parameters have stabilized indicating groundwater and subsequent samples are being collected from the formation and not from the water column. Parameter stabilization is considered to be achieved when three consecutive readings collected at each well volume, are within the following limits:

+/- 0.1 for pH;

+/- 3% for specific conductivity; and

+/- 10% for dissolved oxygen and turbidity.

After stabilization has been achieved, groundwater samples will be collected through the dedicated tubing at a flow rate of approximately 100-250 ml/M into appropriate containers provided by the laboratory. As described previously, samples for PFAS will be collected first followed by samples for VOCs, 1,4-D and the remaining parameters.

5.3 Sample Handling

Samples will be stored in on-site coolers packed with loose ice until they are delivered to the laboratory for analysis. PFAS samples will be placed in separate coolers. Bottles will be packed tightly with Styrofoam, bubble wrap, or similar soft packing materials to protect the containers from breakage. Ice will be added to the cooler along with the chain-of-custody (COC). Coolers will be stored in protected, cool areas to ensure that the samples stay as cool as possible (without freezing). Samples will be placed in coolers directly following sampling to prevent overexposure to sunlight. Field personnel will be responsible for the security of the samples prior to shipment. Coolers will be stored in a secure or monitored area prior to shipment to the laboratory.

Field and quality assurance samples selected for laboratory analysis will be handled and maintained following chain-of-custody protocol. A chain-of-custody will be completed and maintained with the samples, prior to delivery to the laboratory. The samples will then be transported by vehicle to the laboratory for analysis.

6.0 DATA REDUCTION, VERIFICATION, USABILITY AND REPORTING

This section of the QAPP describes the process that will be followed to verify and validate the project data and field activities. Data verification activities will be performed to ensure that data collected as part of this work are consistent with project quality objectives and measurement performance criteria.

6.1 Data Reduction

All data transformation and data reduction procedures will be clearly documented and placed in the project files. All data transformation and data reduction activities performed on the project data will be carefully monitored by both the Project Manager and the Quality Assurance Officer (QA Officer) to ensure that data integrity is maintained.

6.2 Data Verification

Data verification and validation activities will be performed to ensure that data collected as part of the investigation work consistent with project quality objectives and measurement performance criteria.

Upon receipt of both electronic and hard copy analytical data, internal checks will be performed to detect possible errors. The data check will be performed by the QA Officer

6.3 Data Evaluation and Usability

The laboratory will submit the results in full category B deliverable report format and in proper electronic data deliverable (EDD) format. Stantec will then conduct the NYSDEC required data validation review and Data Usability Summary Reports (DUSRs) for the collected soil and groundwater samples. As has been done on previous sampling events, this is a set procedure established by the State to qualify the data received from the laboratory under independent review by Stantec, for use in the BCP.

TABLES

Table 1 - QAPP Sampling Matrix
Analytical Methods and Quality Assurance Summary
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), New York

Proposed Field and Quality Assurance Samples

Matrix	Soil [1]	Water [2]	Soil Vapor [3]
No. of Samples	2/9 and 2/2	28/10/6	3
No. of Equipment Blanks	1	0	0
No. of Field Blanks	1	1	0
No. of Trip Blanks	3	4	0
No. of Duplicate Samples	1	2	0
Matrix Spike (Lab)	1	2 (per analysis)	0
Matrix Spike Duplicate (Lab)	1	2 (per analysis)	0
Samples Stored in the Field (One Day or less)	8	8	0

[1] Two (2) soil samples from nine (9) locations will be analyzed for TCL VOCs, TCL SVOCs, TAL Metals, PCBs, Pesticides, Herbicides, PFAS, and 1,4-dioxane. Two (2) soil samples from two (2) loctions will be analyzed for TCL VOCs only.

[2] Groundwater samples will be collected from all twenty-eigit (28) site wells for VOCs: from ten (10) wells for TAL Metals, TCL SVOCs, PCBs, Pesticides/Herbicides, PFAS, and 1,4-Dioxane: and from six (6) wells for Total Cyanide.

[3] Soil Vapor samples will be collected from three (3) soil gas probes for TO-15. One ambient air sample will also be collected.

Table 2 - QAPP Sampling Matrix
Analytical Methods and Quality Assurance Summary
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), New York

Proposed Analytical Parameters and Methods

Analytical Parameters	Soil Method	Laboratory Reporting Limit	Method Detection Limit
Volatile Organic Compounds (VOCs)	EPA Method 8260D	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)
Semi Volatile Organic Compounds (SVOCs)	EPA Method 8270E	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)
TAL Metals w/mercury	EPA Method 6020B/7470A	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)
Polychlorinated Biphenyls (PCBs)	EPA Method 8082A	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)
Pesticides/Herbicides	EPA Method 8081B	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)	Varies (to meet 6 NYCRR Part 375 Table 6.8(b)
1,4-Dioxane	EPA Method 8270E	0.100 mg/kg	0.0289 mg/kg
PFAS	EPA Method 537.1 Modified	0.5 ug/kg	Varies (to meet Sampling, Analysis and Assessment of PFAS, under NYSDEC's Part 375 Remedial Programs

Table 2 - QAPP Sampling Matrix
Analytical Methods and Quality Assurance Summary
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), New York

Proposed Analytical Parameters and Methods

Analytical Parameters	Water Method	Laboratory Reporting Limit	Method Detection Limit
Volatile Organic Compounds (VOCs)	EPA Method 8260D	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)
Semi Volatile Organic Compounds (SVOCs)	EPA Method 8270E	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)
TAL Metals w/mercury	EPA Method 6020B/7470A	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)
Polychlorinated Biphenyls (PCBs)	EPA Method 8082A	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)
Pesticides/Herbicides	EPA Method 8081B/8151A	0.400 ug/L	Varies (to meet 6 NYCRR Part 703 Groundwater Quality Standards)
1,4-Dioxane	EPA Method 8270E Selective Ion Monitoring (SIM)	0.200 ug/L	0.0160 ug/L
PFAS	EPA Method 537 Modified	2.0 ng/L	Varies (0.240 - 1.00 ng/L)
Total Cyanide	EPA Method 9012A	0.020 mg/L	0.0080 mg/L

Table 2 - QAPP Sampling Matrix
Analytical Methods and Quality Assurance Summary
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), New York

Proposed Analytical Parameters and Methods

Analytical Parameters	Soil Vapor Method	Laboratory Reporting Limit	Method Detection Limit
Volatile Organic Compounds	TO-15 General Level.	Varies (to meet NYS Vapor Intrusion Guidance screening criteria)	Varies (to meet NYS Vapor Intrusion Guidance screening criteria)

mg/kg - milligrams per kilogram (or part per million)
ug/kg - microgram per kilogram (or part per billion)

mg/L - milligram per liter (or part per million)
ug/L - microgram per liter (or part per billion)
ng/L = nanogram per liter (or part per trillion)

Table 3 - QAPP Sampling Matrix
Analytical Methods and Quality Assurance Summary
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), New York

Proposed Sample Preservation, Containers, and Holding Times

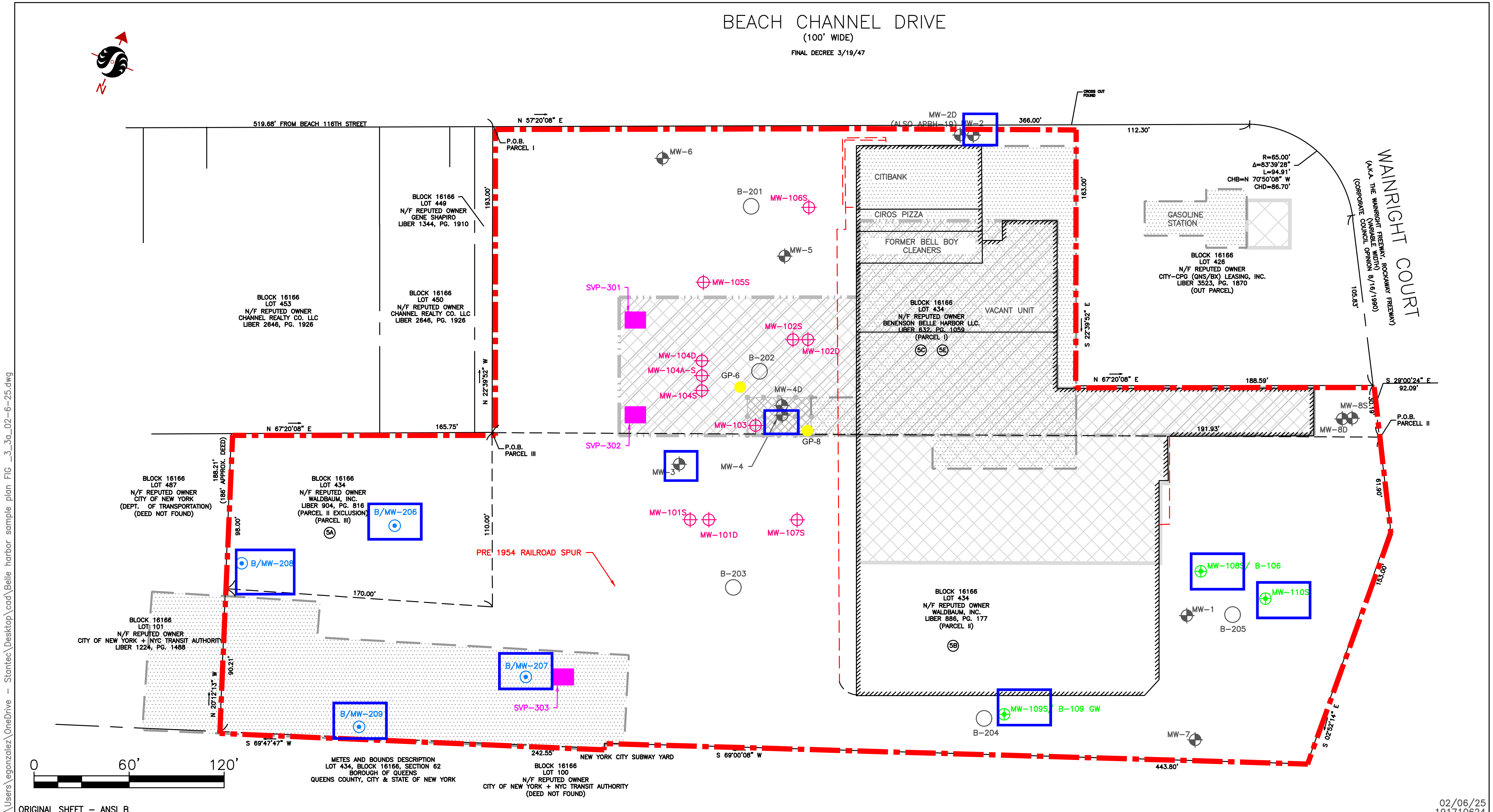
Analytical Parameters	Sample Preservation	Sample Container / Volume	Sample Holding Time
SOIL			
Volatile Organic Compounds (VOCs)	4°C	Encore Sampler	48 hours
Semi Volatile Organic Compounds (SVOCs)	4°C	(1) 4-oz Amber Glass	14 days
TAL Metals	4°C	(1) 4-oz Amber Glass	180 days
Polychlorinated Biphenyls (PCBs)	4°C	(1) 4-oz Amber Glass	14 days
Pesticides/Hervicides	4°C	(1) 4-oz Amber Glass	14 days
1,4-Dioxane	4°C	(1) 4-oz Amber Glass	14 days
PFAS	4°C	(1) 4-oz HDPE	14 Days

Table 3 - QAPP Sampling Matrix
Analytical Methods and Quality Assurance Summary
Belle Harbor Shopping Center
112-15 Beach Channel Drive
Queens (Far Rockaway), New York

Proposed Sample Preservation, Containers, and Holding Times

Analytical Parameters	Sample Preservation	Sample Container / Volume	Sample Holding Time
WATER			
Volatile Organic Compounds	HCL, pH < 2, 4°C	(3) Amber Glass Teflon Lined - 40 ml VOA Vials	14 Days
Semi Volatile Organic Compounds	4°C	(1) 500-ml Amber Glass	7 Days
TAL Metals	HNO3, pH < 2, 4°C	(1) 250-ml HDPE	180 days
Polychlorinated Biphenyls (PCBs)	4°C	(1) 250-ml Amber Glass	7 Days
Pesticides/Hervicides	4°C	(1) 250-ml Amber Glass	7 Days
1,4-Dioxane	4°C	(1) 500-ml Amber Glass	7 Days
PFAS	4°C	(2) 250-ml HDPE	14 Days
Cyanide	NaOH, 4°C	(1) 1-L HDPE	14 Days
SOIL VAPOR			
VOCs (TO-15)	NA	2.7 L Summa Canister, Batch cleaned & certified	28 days

FIGURES



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Legend

MW-3	MONITOR WELL (INSTALLED BY WHITESTONE)	SVP-301	PROPOSED SOIL VAPOR PROBE LOCATION
MW-101	MONITORING WELL (INSTALLED BY STANTEC)	B/MW-206	PROPOSED SOIL BORING, CONVERTED TO MONITOR WELL LOCATION
MW-108S	MONITORING WELL (INSTALLED BY GEI)	MW-4	WELL SAMPLED FOR FULL SUITE OF WQ PARAMETERS
B-204	PROPOSED SOIL BORING LOCATION		

PRE CIRCA 1954

PRE CIRCA 1966

PRE CIRCA 1980

SITE/BCP BOUNDARY

HYDROGEN RELEASE COMPOUND (HRC) INJECTION AREA/POINT – 2008

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC. SEPTEMBER 2012

Client/Project

BELLE HARBOR SHOPPING CENTER
112–15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No.

3A

Title

SITE MAP WITH PROPOSED SAMPLE LOCATIONS

APPENDIX A

eurofins	Always check on-line for validity.	Level:
Document number: **PFAS-SOP63699**	**Analysis of Per and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid , Biosolid, and Tissue Samples by LC-MS/MS Using Final Method 1633**	**Standard Operating Procedure**
Old Reference:		
Version: **7**		Organisation level: **5-Sub-BU**
Approved by: **HWD4** Effective Date: **22-NOV-2024**	Document users: **CLE PFAS All**	Responsible: **CLE PFAS All**

Revision Log

Revision: 4	**Effective date:**	This version
Section	**Justification**	**Changes**
		Update to EPA Method 1633 January 2024

Reference

1. US EPA Method 1633, *Analysis of Per and Polyfluoroalkyl Substances(PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS*, January 2024.

Cross Reference

Document	Document Title
NC-WC-092	Determination of Solids in Waters and Wastes (Total Suspended Solids)
NDSC-QA-SOP42091	Detection and Quantitation Limits

Document	Document Title
NDSC-QA-SOP43862	Manual Integrations
NC-QA-015	Support Equipment Calibration and Verification
NC-QA-018	Statistical Evaluation of Data and Development of Control Charts
QA-003	Quality Control Program
NC-QA-017	Standards and Reagents
NDSC-QA-QP44940	Calibration Curves and the Selection of Calibration Points
NDSC-US-EHS QP46060	NDSC EH&S Manual
NC-QAM-001	QA Manual

Scope

This method is applicable for the determination of selected per- and polyfluorinated alkyl substances (PFAS) in aqueous samples to include non-potable waters and non-regulatory potable water, solids, biosolids and tissue samples when directed by the client. The compounds analyzed in this method are listed in the table below. The most current MDLs and LOQs are listed in the LIMS. Compounds other than those listed may be analyzed by client request.

Analyte	Acronym	CAS#
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorotetradecanoic acid	PFTeDA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluoro-n-butanoic acid	PFBA	375-22-4
Perfluoro-n-pentanoic acid	PFPeA	2706-90-3
8:2 - Fluorotelomersulfonic acid	8:2FTS	39108-34-4
N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
N-ethylperfluoro-1-octanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
4:2-Fluorotelomersulfonic acid	4:2-FTS	757124-72-4
Perfluoropentanesulfonic acid	PFPeS	2706-91-4
6:2-Fluorotelomersulfonic acid	6:2-FTS	27619-97-2
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Perfluorooctanesulfonamide	PFOSA	754-91-6

Analyte	Acronym	CAS#
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	NMeFOSE	24448-09-7
N-methylperfluoro-1-octanesulfonamide	NMeFOSA	31506-32-8
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	NEtFOSE	1691-99-2
N-ethylperfluoro-1-octanesulfonamide	NEtFOSA	4151-50-2
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid; (Hexafluoropropylene oxide dimer acid)	HFPODA	13252-13-6
Ammonium 4,8-dioxa-3H-perfluorononanoic acid	ADONA **	919005-14-4 *
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS, F53B major	756426-58-1 *
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS, F53B minor	763051-92-9 *
3-Perfluoropropylpropanoic acid	3:3 FTCA	356-02-5
3-Perfluoropentylpropanoic acid	5:3 FTCA	914637-49-3
3-Perfluoroheptylpropanoic acid	7:3 FTCA	812-70-4
Perfluoro-3-methoxypropanoic acid	PFMPA, PFECA F	377-73-1
Perfluoro-4-methoxybutanoic acid	PFMBA, PFECA A	863090-89-5
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA, PFECA B	151772-58-6
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA, PES	113507-82-7

Additional compounds available upon client request

Analyte	Acronym	CAS#
Perfluoro-1-butanesulfonamide	FBSA	30334-69-1
Perfluoro-1-hexanesulfonamide	FHxSA	41997-13-1
Perfluoro-4-ethylcyclohexanesulfonate	PFECHS	133201-07-7
10:2-Fluorotelomersulfonic acid	10:2-FTS	108026-35-3
Perfluoropropanoic acid	PFPrA	422-64-0
Perfluoro-n-octadecanoic acid	PFODA	16517-11-6
Perfluoro-n-hexadecanoic acid	PFHxDA	67905-19-5
Bis(trifluoromethane)sulfonimide	TFSI	82113-65-3
Perfluoropropanesulfonic acid	PFPRS	423-41-6
Bis[2-(perfluorohexyl)ethyl] phosphate	6:2 diPAP	57677-95-9
Bis[2-(perfluorooctyl)ethyl] phosphate	8:2 diPAP	678-41-1
(Perfluorohexyl)ethyl (perfluorooctyl)ethyl hydrogen phosphate	6:2/8:2 diPAP	943913-15-3

*CAS# for the free acid form of the analyte

**Acronym for the free acid form of the analyte

Basic Principles

A solid or tissue sample is fortified with isotopically-labeled extraction standards. The sample extract is shaken, centrifuged, and the supernatant decanted. Sample extract is diluted to volume and then concentrated and follows procedure of aqueous samples. An aqueous sample is fortified with isotopically-labeled extraction standards and is passed through a solid phase extraction (SPE) cartridge to extract the analytes. The compounds are eluted from the solid phase with a combination of solvents. Carbon cleanup is performed on each sample extract. The extract is filtered and fortified with Isotopically-labeled injection internal standards. It is then analyzed by LC/MS/MS operated in negative electrospray ionization (ESI) mode for detection and quantification of the analytes. Quantitative analysis is performed using isotope dilution.

Interferences

Compounds which have similar structures to the compounds of interest and similar molecular weights would potentially interfere. Method interferences may be caused by contaminants in solvents, reagents (including reagent water), sample bottles and caps, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. The analytes in this method can also be found in many common laboratory supplies and equipment, such as PTFE (polytetrafluoroethylene) products, LC solvent lines, methanol, aluminum foil, etc. A laboratory blank is performed with each batch of samples to demonstrate that the extraction system is free of contaminants.

Precaution to Minimize Method Interference

1. LC system components contain many of the target analytes. To minimize the background PFAS peaks, PTFE solvent frits and tubing are replaced by PEEK™ solvent frits and tubing where possible.

2. A precolumn, Phenomenex Luna, 30 x 2 mm, 5 µm C18 column (or equivalent), is installed before the injection valve to separate PFAS in standards/samples from those from the LC system and mobile phases.

3. Promochrom systems must be cleaned before and after each use. Cleaning of Promochrom systems with 1% methanolic ammonium hydroxide must be done at least once a week or more depending on usage.

Safety Precautions and Waste Handling

See NDSC EH&S Manual, the Facility Addendum to the NDSC EH&S Manual, and this document for general information regarding employee safety, waste management, and pollution prevention.

The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined. PFOA has been described as “likely to be carcinogenic to humans”. Each chemical should be treated as a potential health hazard and exposure to these chemicals should be minimized.

Exposure to these chemicals must be reduced to the lowest possible level by whatever means available, such as fume hoods, lab coats, safety glasses, and gloves. Gloves, lab coats, and safety glasses should be worn when preparing standards and handling samples. Avoid inhaling solvents and chemicals and getting them on the skin. Wear gloves when handling neat materials. When working with acids and bases, take care not to come in contact and to wipe any spills. Always add acid to water when preparing reagents containing concentrated acids.

All laboratory waste is accumulated, managed, and disposed of in accordance with all Federal, State, and local laws and regulations. All solvent waste and extracts are collected in approved solvent waste containers in the laboratory and subsequently emptied by personnel trained in hazardous waste disposal into the lab-wide disposal facility. HPLC vials are disposed of in the lab container for waste vials, and subsequently lab packed. Any solid waste material (disposable pipettes and broken glassware, etc.) may be disposed of in the normal solid waste collection containers.

Personnel Training and Qualifications

All personnel performing this procedure must have documentation of reading, understanding, and agreeing to follow the current version of this SOP and an annual documented Demonstration of Capability (DOC).

Each chemist performing the extraction must work with an experienced employee for a period of time until they can independently perform the extraction. Also, several batches of sample extractions must be performed under the direct observation of another experienced chemist to assure the trainee is capable of independent preparation. Proficiency is measured through a documented Initial Demonstration of Capability (IDOC).

Each LC/MS/MS analyst must work with an experienced employee for a period of time until they can independently calibrate the LC/MS/MS, review and process data, and perform maintenance procedures. Proficiency is measured through a documented Initial Demonstration of Capability (IDOC).

The IDOC and DOC consist of four laboratory control samples (or alternatively, one blind sample for the DOC) that is carried through all steps of the extraction and meets the defined acceptance criteria. The criteria include the calculation of mean accuracy and relative standard deviation. IDOC trials are spiked at the OPR Level. IDOC must meet the requirements for the IPR for target, EIS and NIS compounds as listed in Tables 5 and 6 of method 1633 for aqueous matrices and Tables 7 and 8 for non-aqueous matrices. See *Attachment 19*.

Sample Collection, Preservation, and Handling

A. Sample Collection

Aqueous samples are collected in 125-mL HDPE containers. Solid samples are collected in 4oz PP specimen containers, with polyethylene screw caps. All sample containers must have linerless HDPE or polypropylene caps. Keep the sample sealed from time of collection until extraction.

Fish samples may be received as a whole fish, fish fillets, or other tissues for analysis. For client homogenized tissues, the samples are collected in 4oz PP specimen containers, with polyethylene screw caps. If whole fish are collected it will be wrapped in aluminum foil or food-grade polyethylene tubing. Keep the sample sealed from time of collection until extraction.

NOTE: PFAS contamination during sampling can occur from a number of common sources, such as food packaging and certain foods and beverages. Proper hand washing and wearing nitrile gloves will aid in minimizing this type of accidental contamination of the samples.

B. Aqueous Sample Storage and Shipment

1. Samples must be chilled during shipment and must not exceed 6°C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 6°C when the samples are received at the laboratory.

2. Samples stored in the lab must be held at a temperature of 0° to 6°C, not frozen, and protected from light until extraction. Alternatively, to meet project requirements, samples may be stored at or below ≤ -20°C and protected from light until extraction.

3. Water samples must be extracted within 28 days when stored at a temperature of 0° to 6°C, not frozen, and protected from light. Water samples must be extracted within 90 days when stored at a temperature ≤ -20°C and protected from light. Extracts must be analyzed within 28 days after extraction. Extracts are stored at a temperature of 0° to 6°C and protected from light.

C. Solid Sample Storage and Shipment

1. Solid and Biosolid samples must be chilled during shipment and must not exceed 6°C during the first 48 hours after collection. Sample temperature must be confirmed to be at 0° to 6°C when the samples are received at the laboratory.

2. Solid and Biosolid samples stored in the lab must be protected from light and held at a temperature of 0° to 6°C, or ≤ -20°C, until extraction.

3. Solid and Biosolid samples must be extracted within 90 days. Extracts must be analyzed within 28 days after extraction. Extracts are stored at a temperature of 0° to 6°C and protected from light.

NOTE: Biosolid samples stored under refrigeration may produce gases that may cause sample to be expelled from the container when opened. This may produce noxious odors. It is recommended to store frozen if extraction will not occur for a few days.

D. Tissue Sample Storage and Shipment

1. Tissue samples are maintained at 0 to 6°C for a maximum of 24 hours. Sample temperature must be confirmed to be at or below 6°C when the samples are received at the laboratory.

2. Samples stored in the lab must be protected from light and held at a temperature of ≤-20°C until extraction.

3. Tissue samples must be extracted within 90 days, or as soon as possible if NFDHA is an analyte of interest. Extracts must be analyzed within 28 days after extraction. Extracts are stored in the refrigerator and protected from light.

Apparatus and Equipment

A. Apparatus

1. 125 mL HDPE bottles: Environmental Sampling Supply; #0125-1902-QC, or equivalent.

2. Centrifuge tubes – 15-mL conical polypropylene with polypropylene screw caps; Fisher Scientific, Cat. No. 14955237 or equivalent

3. 10-mL polypropylene volumetric flask, Class A – Fisher Scientific, Cat. No. S02288 or equivalent.
4. HDPE bottles for extraction fluid storage: L; Environmental Sampling Supply, Cat. No. 1000-1902-PC, or equivalent.
5. Analytical Balance – Capable of weighing to 0.0001 g
6. Top-Loading Balance – Capable of weighing to 0.01 g
7. Phenomenex Strata-X-AW 33um Polymeric Weak Anion 200mg/6mL (Part# 8B-S541-FCH) or equivalent.
8. Large-volume SPE Reservoir (25-mL) - Millipore-Sigma; Product # 54258-U.
9. SPE Tube Adapter - Millipore-Sigma; Product # 57020-U.
10. SPE vacuum extraction manifold –"Resprep" 24-port manifold; Restek Corp catalog # 26080, or equivalent.
11. Polypropylene SPE delivery needles – Agilent; Cat. No. 12234511.
12. Vacuum manifold for Solid Phase Extraction (SPE).
13. Centrifuge – "Thermo Sorvall ST4" with TX-750 rotor or equivalent, capable of a maximum rotational force of 3800 rcf.
14. Auto Pipettes – Eppendorf; capable of accurately dispensing 10- to 1000-µL. FisherScientific cat # 14-287-150, or equivalent.
15. Polypropylene pipette tips: 0-200µl. Fisher; Cat. No. 22491539
16. Polypropylene pipette tips: 101-1000µl. Fisher, Cat. No. 5414006
17. Pipettes – Disposable transfer. Fisher Scientific, Cat. No. 13-711-7M
18. Vortex mixer, variable speed, Fisher Scientific or equivalent.
19. N-Evap sample extract concentrator with N_2 supply and water bath for temperature control. Organomation, Inc. Cat. #11250-NT, or equivalent.
20. Thermo Target PP Polyspring inserts, catalog number C4010-630P, or equivalent
21. Thermo Target 9mm PP vials, catalog number C4000-14, or equivalent
22. Agilent 9mm vial caps, polypropylene/silicone septa, catalog 5191-8151, or equivalent
23. Centrifuge tubes – 50-mL conical polypropylene with polypropylene screw caps; Fisher Scientific, Cat. No. 06-443-21 or equivalent
24. Polypropylene bottles for standard storage - 4 mL; Fisher Scientific, Cat. No. 2006-9125
25. Stainless steel spatula/scoop set. Bel-Art SP Scienceware; Product # 11-865-130, or equivalent
26. pH paper, range 4.5-10, VWR BDH Chemicals, Cat. #BDH 35311.604 or equivalent
27. Syringe filter - Acrodisc, Syringe Filter, 25 mm, 0.2 µm, 50/pkg, Fisher part # 50786068.
28. Silanized glass wool, Supelco # 20411 or equivalent
29. Wheaton Bottle, 15ml, narrow mouth, HDPE, Leak resistant; DWK Life Sciences, Cat. No. 209044SP, or equivalent
30. Phenomenex Strata GCB, 25mg/1mL IC Cartridge (Part# 8B-S528-CAJ) or equivalent
31. Sonicator - Branson Ultrasonics M Series Ultrasonic Cleaning Bath, Model M88000, Fisher, or equivalent
32. Stainless steel bowl, 4 quart or equivalent
33. Stainless steel cutting board or equivalent
34. Stainless steel knife
35. Food Processor- "Robot Coupe Bliver 3" or equivalent, Stainless steel
36. Blender - Waring Commercial BB3005, 1 HP bar Blender, Part Number B071SF8419 or equivalent, stainless steel.

37. Wooden Tongue Depressors - Fisher; Cat. # 11-700-555, or equivalent.

B. Equipment

1. AB Sciex Triple Quad 4500/5500/5500 Plus Turbo V Ion Source

   ExionLC Controller
   ExionLC AC Pump
   ExionLC AC Autosampler
   Exion AC Column Oven
   Data system –Analyst 1.6.3

2. PromoChrom automated extractor, model, SPE-03, or equivalent
   a. Promochrom Filters, Catalog Number F-HC-30

3. HPLC columns

   a. Analytical column: Gemini 3μm C18, 50 x 3 mm, Phenomenex Cat# 00B-4439-Y0 or equivalent

   b. Pre-column: Luna, 5μm C18, 50 x 3 mm, Phenomenex Cat# 00B-4252-Y0, or equivalent

Reagents and Standards

All solvents, acids, and bases are stored in glass bottles in flammable proof cabinets or pressure resistant steel drums. Solvents, acids, and bases are stored at ambient temperature for up to 1 year. All non-solvents are stored according to manufacturer's storage conditions. All reagents are verified before use by the associated Certificate of Analysis or by analysis of the Method Blank.

A. Reagents:

1. Methanol (MeOH) – Fisher Scientific,, Cat. No. A456-4 or equivalent

2. Acetonitrile (ACN) – J.T. Baker Ultra Resi-Analyzed, Cat. No. UN1648 or equivalent

3. Water – Fisher Scientific, Optima, Cat. No. W6-4 or equivalent

3. Ammonium acetate – Fisher Scientific, Cat. No. A637-500 or equivalent

4. Ammonium hydroxide - Fisher Scientific, Cat. no. A669S-500 or equivalent

5. Methanolic ammonium hydroxide (3%) - add ammonium hydroxide (9.9 mL) to methanol (90.1 mL), store at room temperature, replace after 1 month

6. Methanolic ammonium hydroxide (2%) - add ammonium hydroxide (66 mL) to methanol (934 mL), store at room temperature, replace after 1 month

7. Methanolic ammonium hydroxide (1%) - add ammonium hydroxide (33 mL) to methanol (967 mL), store at room temperature, replace after 1 month

8. Methanolic ammonium hydroxide (0.3%) - add ammonium hydroxide (10mL) to methanol (990mL), store at room temperature, replace after 1 month

9. 30:70 Methanol:Water - add 300mL methanol to 700mL water

10. Formic acid-(greater than 96% purity or equivalent), store at room temperature.

    a. Formic acid (aqueous, 0.3 M) - dissolve formic acid (13.8 g) in reagent water (1 L), store at room temperature, replace after 2 years

    b. Formic acid (aqueous, 5% v/v) - mix 5 mL formic acid with 95 mL reagent water, store at room temperature, replace after 2 years

    c. Formic acid (aqueous, 50% v/v) - mix 50 mL formic acid with 50 mL reagent water, store at room temperature, replace after 2 years

11. Mobile Phase A: 10 mM ammonium acetate solution in 95:5(v/v) reagent water/acetonitrile-Weigh 1.55g ± 0.01g ammonium acetate into a 2-L glass mobile phase bottle. Add 1900 mL reagent water and mix well to dissolve the ammonium acetate. Add 100 mL acetonitrile and mix well. Store at room temperature for up to 2 months. Different volumes can be prepared as long as final concentrations are equivalent.

12. Mobile Phase B: Acetonitrile

13. Potassium Hydroxide - Certified ACS, Fisher P250-500 or equivalent

14. 0.4% KOH in Methanol - 4.7g Potassium hydroxide into 1L of MeOH, store at room temperature, replace after 3 months

B. Standards:

1. Standards are prepared using calibrated pipettes, polypropylene microcentrifuge tubes, polypropylene bottles, and 10 ml Class A PP volumetric flasks to create solutions at desired concentrations. The concentrated solution is injected below the surface of the diluting solvent. After preparation is completed, standards should be vortexed to ensure complete mixing. Measurement of volumes less than 10 µl should be avoided in routine production operations.

2. All stock, intermediate and spiking solutions are prepared using Methanol.

3. All initial calibration, initial calibration verification, and bile salt working standard solutions are prepared using Methanol.

4. All diluted solutions must be stored in HDPE containers that have been thoroughly rinsed with methanol.

5. While PFAS standards commercially purchased are supplied in glass ampoules, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene or HDPE containers. Vortex all standard solutions prior to removing aliquots. Stock standard and intermediate standard solutions are stored in the refrigerator in labeled polypropylene screw-top vials, PP bottles, or PP centrifuge tubes.

6. Expiration dates are managed through LIMS Reagent. Solutions transferred from sealed glass ampules to screw-capped vials are given expiration dates provided by the vendor or 1 year if there is none. Intermediate solutions are given an expiration date of 6 months from the preparation date, or the expiration date from the ampule provided by the vendor, whichever occurs sooner. The ampules and transferred solutions are stored in the refrigerator.

7. Working native and labeled (extraction surrogate and internal standard) compound spiking solutions are given an expiration date of 6 months, or the expiration date of the solutions used to prepare the working solution, whichever occurs sooner. The solutions are stored in labeled polypropylene screw-top vials in the refrigerator. When these solutions are prepared they must be tested prior to use in the PFAS extraction lab and verified monthly until they are consumed by operations or expire. Records of the standard verification are maintained by the laboratory. Prior to use, the working spiking solution should be evaluated against recovery windows of 85-115% for all compounds that will be analyzed using that solution. Should a standard fail to meet these criteria, the data must be reviewed by departmental management for acceptability and/or corrective action.

Working initial calibration solutions are given an expiration date of 6 months, or the expiration date of the solutions used to prepare the working initial calibration solution, whichever occurs sooner.

8. The primary/preferred standard vendor is Wellington Laboratories, Inc. Ontario, Canada. Listed catalog numbers are taken from Wellington product lists. Equivalent standards may be substituted, if the listed standards are unavailable. Standards are predominantly at a concentration of 50 ug/mL in basic methanol. In the case of the sulfonic compounds, the concentration is 50ug/mL of the alkali (potassium or sodium) salt. The laboratory uses the concentration of the acid form when determining the concentration of individual sulfonic acids in solution.

The solution concentration listed is as presented on the certificate of analysis and includes adjustment for purity and the salt form of the compound used.

Note: The concentrations referenced for the sulfonate salts, (for example PFBS, PFHxS and PFOS) have already been corrected to the acid form by the standards supplier as noted in the example Certificate of analysis (CofA). See *Attachment 04*.
If the compound purity is assayed to be 98% or greater, weight can be used without correction to calculate concentrations.

As stated above, PFBS, PFHxS, PFHpS, PFOS, PFDS, and many other PFAS are not available in the acid form, but rather as their corresponding salts, such as sodium or potassium. The standards are prepared and corrected for their salt content according to the equation below (if not already corrected by the supplier).

$$\text{Mass}_{acid} = \text{Measured Mass}_{salt} \times \text{MW}_{acid} / \text{MW}_{salt}$$

Where: MW_{acid} is the molecular weight of PFAA
MW_{salt} is the molecular weight of the purchased salt.

For example, the molecular weight of PFOS is 500.1295 and the molecular weight of NaPFOS is 523.1193. Therefore, the amount of NaPFOS used must be adjusted by a factor of 0.956.

9. Log purchased standards into LIMS Reagent. Select the solution category SOURCE for purchased mixes and/or single-compound ampules. LIMS Reagent system will assign formatted names to the purchased standard solutions. The automatically-generated name can be overwritten with a manually created name if desired. Use labels printed through the LIMS Reagent to identify and track standard solutions after transfer from original ampule to storage vial. The CofA for the ampulated stock standard is attached in LIMS Reagent for reference.

10. Standards are prepared by transferring a known quantity of Standard to a final volume of solvent. Standard Preparation is documented in LIMS Reagent. Solutions are stored by Type in LIMS Reagent, i.e., INTERMEDIATE=working solutions and intermediate standards and SOURCE=stocks (ampulated solutions). Each Standard is given a unique name.

Refer to the documentation in LIMS Reagent for standards preparation information.

Calibration

A. Initial Calibration

1. A minimum of six calibration standards are required when using an average or linear curve fit. A minimum of seven calibration standards are required for a second-order(quadratic) curve fit. In general, Cal 0 (half the RL), Cal1 (RL), Cal2, Cal3, Cal4, Cal5, Cal6, and Cal7 are included in the initial calibration. The calibration standards contain the branched isomers for PFHxS, PFOS, PFOA, PFNA, PFOSA, NMeFOSAA, NEtFOSAA, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE. S/N ratio must be greater than or equal to 3:1 for all ions used for quantification.

2. Analyze a standard (WDM) that contains EIS, NIS and Bile Salt retention time markers at a concentration of 100 ppb containing Taurodeoxycholic Acid (TDCA), Taurochenodeoxycholic acid (TCDCA), and Tauroursodeoxycholic acid (TUDCA). The analysis of this standard is used to evaluate the chromatographic program relative to the risk of an interference from bile salts in tissue samples. The laboratory must establish chromatographic conditions to ensure the bile salt (TDCA) does not cause interference during the analysis of samples. To demonstrate successful separation the retention time of TDCA must be at least 1 minute outside the retention time window of PFOS. This is demonstrated as a comparison of the RT of TDCA (measured at the apex of the TCDA peak) separated by at least 1.4 minutes from the RT of the linear isomer of PFOS (measured at the apex of the peak of the linear isomer of PFOS). If the mobile phase does not contain acetonitrile, this check must include all three bile salts (TDCA, TCDCA, and TUDCA). If adequate separation is not achieved, adjust the chromatographic conditions and reevaluate the separation of TDCA from PFOS.

   Example Initial Calibration Sequence:
   1. Instrument Blank
   2. Instrument Blank
   3. Instrument Blank
   4. CAL 0
   5. CAL 1
   6. CAL 2
   7. CAL 3
   8. CAL 4
   9. CAL 5
   10. CAL 6
   11. CAL 7
   12. ICB (Instrument Blank)
   13. ICV
   15. WDM (Bile Salts standard)

3. Isotopically-labeled compounds are not available for some compounds. See below for compounds and their referenced extraction standards. See *Attachment 02* for additional information about compound relationships.

   NOTE: For better accuracy, PFTrDA is quantitated using the average of the areas of labeled compounds 13C2-PFTeDA and 13C2-PFDoDA.

Compound	Extraction Standard
PFBA	13C4-PFBA
PFPeA	13C5-PFPeA
3:3FTCA	13C5-PFPeA
PFMPA	13C5-PFPeA
PFMBA	13C5-PFPeA
PFHxA	13C5-PFHxA
NFDHA	13C5-PFHxA
5:3FTCA	13C5-PFHxA
7:3FTCA	13C5-PFHxA
PFEESA	13C5-PFHxA
PFHpA	13C4-PFHpA
PFOA	13C8-PFOA
PFNA	13C9-PFNA
PFDA	13C6-PFDA
PFUnA	13C7-PFUnA
PFDoA	13C2-PFDoA
PFTrDA	Avg 13C2-PFTeDA and 13C2-PFDoA
PFTeDA	13C2-PFTeDA
PFBS	13C3-PFBS
PFPeS	13C3-PFHxS
PFHxS	13C3-PFHxS
PFHpS	13C8-PFOS
PFOS	13C8-PFOS
PFNS	13C8-PFOS
PFDS	13C8-PFOS
PFDoS	13C8-PFOS
4:2-FTS	13C2-4:2-FTS
6:2-FTS	13C2-6:2-FTS
8:2-FTS	13C2-8:2-FTS
PFOSA	13C8-PFOSA
NMeFOSA	D3-NMeFOSA
NEtFOSA	D5-NEtFOSA
NMeFOSAA	D3-NMeFOSAA
NEtFOSAA	D5-N-EtFOSAA
NMeFOSE	D7-NMeFOSE
NEtFOSE	D9-NEtFOSE
HFPO-DA	13C3-HFPO-DA
DONA	13C3-HFPO-DA

9Cl-PF3ONS	
11Cl-PF3OUdS	

Additional Compounds

Compound	Extraction Standard
FBSA	13C3-PFBS
FHxSA	13C3-PFHxS
PFECHS	
10:2-FTS	13C2-8:2-FTS
PFPrA	13C3-PFPrA
PFODA	13C2-PFTeDA
PFHxDA	13C2-PFHxDA
TFSI	13C4-PFBA
PFPrS	13C4-PFBA
6:2 diPAP	13C4-6:2 diPAP
6:2/8:2 diPAP	
8:2 diPAP	13C4-8:2 diPAP

5. Fit the curve

   a. If the %RSD for the response factors is less than or equal to 20%, the average response factor (Ave RRF) can be used to quantitate the data.

   b. If the %RSD is greater than 20%, a linear regression with a concentration weighing factor of 1/x is tried for compounds not meeting the criteria in 5.a. The RSE for all method analytes must be less than or equal to 20%.

   c. For all curve fits, each calibration point is calculated back against the curve. The back calculated concentration for each calibration point should be within ±30% of its true value.

   d. If the criteria are not met, the source of the problem must be determined and corrected. Situations may exist where the initial calibration can be used. In those cases, the data will be reported with a qualifying comment.

   NOTE: The concentrations referenced for the sulfonate salts, (for example PFBS, PFHxS and PFOS) have already been corrected to the acid form by the standards supplier as noted in the example Certificate of Analysis (CofA). See *Attachment 04*.

6. Initial Calibration Verification (ICV)

   A check standard prepared from a second source (ICV) is injected to confirm the validity of the calibration curve/standard. A second source of a different lot number or from a different vendor should be used. The calculated amount for each analyte must be within ±30% of the true value. If this criteria is not met, re-inject or remake the standard. If the criteria is still not met, recalibration is necessary. Instrument maintenance may be needed prior to recalibrating.

B. Continuing calibration

1. Once the calibration curve has been established, the continuing accuracy must be verified by analysis of a continuing calibration verification (CCV) standard every ten samples and at the end of the analysis sequence. Subsequent CCV standards should use the Cal4 level standard.

2. Acceptance criteria

   a. The calculated amount for each target compound in the CCV standard must be within ±30% of the true value. Samples that are not bracketed by acceptable CCV analyses must be reanalyzed. The exception to this would be if the CCV recoveries are high, indicating increased sensitivity, and there are no positive detections in the associated samples, the data may be reported with a qualifying comment. If two consecutive CCVs fail criteria for target analytes, two passing CCVs must be analyzed or the source of the problem determined and the system recalibrated before continuing sample analysis.

b. The absolute areas of the injection internal standards should be greater than 30% of the average areas measured during the initial calibration.

Procedure

All water samples are visually evaluated for Total Suspended Solids (TSS). Although the full container volume of sample should be extracted, this method is applicable to aqueous samples containing up to 100 mg/L of suspended solids. For samples containing >100mg/L of suspended solids, or when unavoidable due to high levels of PFAS, smaller sample volumes may be analyzed. However, ultimately, visual inspection and analyst experience are used to determine the volume to be used to extract the sample.

A. Aqueous Sample Preparation

1. Weigh sample container with contents on a calibrated top loading balance, and record the first reading in the automated prep entry system.

   a. For all samples, the full bottle must be extracted. The sample must remain in the original sample container until after spiking solutions have been added.

2. Use a 125 mL HDPE bottle for the method blank, the laboratory control sample (LCS), laboratory control sample duplicate (LCSD) and the low level laboratory control sample (LLCS). Fill each bottle with 125 mL of reagent water. Record 125 mL as the volume for the batch QC samples on the batchlog.

3. Spike QC and all samples with 50 µl of Working labeled extraction standard spike solution (1633 EIS Mix). Spike LCS/LCSD with 50 µl of native 1633 mid-level spike solution (1633 Mid Spike) (Optional: MS/MSD upon client request). Spike LLCS with 40µl of native 1633 low-level spike solution (1633 Low Spike). MDLs spiked with 20uL native 1633 low-level spike solution (1633 Low Spike). Vortex/Shake containers to mix thoroughly. Vortex all spike solutions prior to use.

4. Check that the pH is 6.0±0.5. If necessary, adjust the pH with 50% formic acid (or with 5% formic acid) or 3% methanolic ammonium hydroxide. **NOTE: Never put pH test strips into the sample. Use a disposable pipette to place a few drops of sample onto the pH paper.**

B. Solid and Tissue Sample Preparation

1. On a calibrated, top-loading balance:

   a. Solids: accurately weigh 2g ± 0.10g (dry weight; note: maximum 5g sample aliquot) (0.5 g for biosolids (dry weight; note: maximum 1g sample aliquot)) of solid sample into a tared, labeled 50-mL centrifuge tube using a disposable polypropylene spatula. Record sample weight in the prep entry system. Vortex all spike solutions prior to use.

   For each batch - maximum 20 samples - include the following quality control samples:

   a. Method Blank: Weigh 2 ± 0.10g (0.5 g for biosolids) of sand wetted with 2.5 mL (0.25 mL for biosolids) of reagent water

   b. LCS/LCSD: Fortify 2g ± 0.10g (0.5 g for biosolids) of sand wetted with 2.5 mL (0.25 mL for biosolids) reagent water and spiked with 50 µl of native 1633 mid-level spike solution (1633 Mid Spike). Optional: MS/MSD upon client request.

   c. LLCS: Fortify 2g ± 0.10g (0.5 g for biosolids) of sand wetted with 2.5 mL (0.25 mL for biosolids) reagent water and spiked with 40µl of native 1633 low-level spike solution (1633 Low Spike). Note: MDLs spiked with 20uL native 1633 low-level spike solution (1633 Low Spike).

   b. Tissue: accurately weigh 1.0g ± 0.10g of tissue sample into a tared, labeled 50-mL centrifuge tube using a stainless steel spatula. Record sample weight in the prep entry system. Vortex all spike solutions prior to use.

   For each batch - maximum 20 samples - include the following quality control samples:

   a. Method Blank: Weigh 1.0g ± 0.10g of tilapia

   b. LCS/LCSD: Fortify 1.0g ± 0.10g of tilapia spiked with 50 µl of native 1633 mid-level spike solution (1633 Mid Spike). Optional: MS/MSD upon client request

   c. LLCS: Fortify 1.0g ± 0.10g of tilapia spiked with 40µl of native 1633 low-level spike solution (1633 Low Spike). Note: MDLs spiked with 20uL native 1633 low-level spike solution (1633 Low Spike).

   NOTE: If a laboratory must dissect a whole fish to obtain appropriate tissue for analysis, the benchtop should be covered with clean aluminum foil, and use clean processing equipment to dissect each sample. Samples should be handled in a semi-thawed state for compositing and/or homogenization. Collect the tissue sample in a stainless steel bowl during grinding and mix using a stainless-steel spoon. Store samples in clean HDPE containers and store frozen until used for sample preparation.

If using a grinder, mix the ground tissue with a spoon after the entire sample has been processed, and transfer back to the grinder. Repeat this process at least two more times until the homogenized tissue has consistent color and texture.

2. Add 50 µl working labeled extraction standard spike solution (1633 EIS Mix) to each sample/QC tube.

3. Cap and vortex for approximately 30 seconds.

4. Allow samples/QC to equilibrate for at least 30 minutes.

5. Add 10 mL of 0.4% KOH in methanol to each centrifuge tube.

6. Cap and vortex.

7. Sonicate for in ultrasonic bath for 1 hour.

8. Centrifuge at 3000 rcf for 10 minutes and decant the supernatant into a second 50mL extraction tube.

9. Add another 4 mL of 0.4% KOH in methanol to the remaining sample in each centrifuge tube.

10. Shake by hand to disperse.

11. Centrifuge at 3000 rcf for 10 minutes and decant the supernatant into the second tube with the previous supernatant.

12. Centrifuge the combined supernatant at 3000 rcf for 10 minutes.

13. Decant the extract from each tube into a clean, labeled, 125 ml HDPE bottle. Bring the 125-mL HDPE container up to 125 mL with Milli-Q water.

14. Check that the pH is 6.0±0.5. If necessary, adjust the pH with 50% formic acid (or with 5% formic acid) or 3% methanolic ammonium hydroxide. Typically, add 95uL of 50% FA to each bottle then verify and further adjust if necessary. **NOTE: Never put pH test strips into the sample. Use a disposable pipette to place a few drops of sample onto the pH paper.**

15. Invert container to thoroughly mix.

C. Solid Phase Extraction (SPE) – Automated Sample Extraction using Promochrom

Note: all samples must be prescreened prior to use of the promochrom to avoid carryover and contamination.

1. Pack clean silanized glass wool to a quarter of the height of the SPE cartridge barrel if analyst determines necessary.

2. Label each SPE cartridge to correspond with each associated sample/QC piece and attach to a rinsed SPE port. Record the SPE port # for each sample/QC piece on the batchlog. Method blank should be rotated between Promochrom ports and instruments.

3. Check to make sure all reagent bottles are filled and that reagents are not expired. Reagents should be as follows:
   Solvent 1: Methanol
   Solvent 2: Reagent Water
   Solvent 3: 0.3M Formic Acid in Water
   Solvent 4: 30:70 Methanol:Water
   Solvent 5: 1% Methanolic Ammonium Hydroxide
   Solvent 6: 0.3% Methanolic Ammonium hydroxide

4. Label each sample bottle and cap with the same number to ensure samples are not inadvertently switched during the extraction procedure (i.e.; 1,1,1; 2,2,2; 3,3,3; etc.).

5. Select “Clean sys-004” from the drop down menu to start the cleaning cycle prior to SPE. Make sure the “Clean” cartridges and bottles are attached for this cycle. After the "Clean sys-004" has finished, attach Promochrom filters to the bottles, select "Clean Filter" from the drop down menu to clean filters prior to SPE.

6. Remove “Clean” cartridges and attach the labeled cartridges that will be used when running the samples when the system cleaning is complete. Disconnect the “Clean” bottles. Attach the labeled sample bottles by twisting the bottles and not the cap. Place sample bottles upside down in corresponding numbered location on shaker. Poke two holes into the lip of each

bottle. Load labeled centrifuge tubes in the moving tray beneath the cartridges. Ensure sample bottle lines are not crossed and leading to the correct port.

7. Select “EPA 1633 Final” from the drop down menu and press the green check mark to start the procedure. Note: N2 dry down should be 25 minutes long.
   a. For aqueous samples, adjust the sample volume to the highest bottle weight in the prep batch.

   b. Promochrom method is briefed as follows:
      1.Pre-wash:5 mL of 0.3% NH_4OH/Methanol followed by
         5.0 mL of 0.3 M Formic Acid/H_2O
      2. Load samples
      3. Wash sample bottle with 2x5 mL of H20, add to cartridge
      4. Pre-elution wash: rinse SPE Column with 2x 5mL 30:70 methanol:water
      5. Nitrogen dry for 25 minutes (manual stop after this)
      6. Elute with 5 mL of 1% NH_4OH/Methanol (2 x 2.5 mL elutions), 1 mL/minute flow rate

Note: if the SPE cartridge clogs during extraction, terminate the clogged extraction and re-extract sample at a smaller aliquot.

9. Once the manual stop occurs before the final cartidge elution, attach the carbon filters to the bottom of each SPE cartridge and place back on promochrom, press start.

8. Once the cycle is complete, remove centrifuge tubes and discard the used cartridges and bottlesFor aqueous samples, weigh empty sample bottles and record in prep batch before discarding. Reattach “Clean” bottles and cartridges, select "clean sys-004" from menu, select “start”. This must be done between each batch and at the beginning and the end of the day.

9. Add 50 uL of Internal Standard Spike Solution (1633 NIS Mix) to each sample extract.

11. Bring each sample extract to final volume 5mL using 95:5 methanol:water.

Note: If there are noticeable particulates in extract and analyst deems necessary: Place a syringe filter (25-mm filter, 0.2-μm nylon membrane) on a 5 mL polypropylene syringe. Take the plunger out and carefully decant the sample supernatant into the syringe barrel. Replace the plunger and filter the entire extract into the new collection tube.

12. Cap and vortex to mix.

13. Transfer a portion of the final extract to the corresponding labeled auto-sampler vial. Cap the auto-sampler vial. Samples are now ready for analysis.

14. Cap the centrifuge tube. The remaining extracts are stored in the refrigerator for reinjection if needed.

15. Update all prep batch info and record any necessary NCM's.

E. LC/MS/MS Analysis

1. Mass Calibration and Tuning

   a. At instrument set up and installation, after the performance of major maintenance, or annually, calibrate the mass scale of the MS with calibration compounds and procedures described by the manufacturer. The entire mass range must be calibrated.

   b. When masses fall outside of the +/- 0.5 amu of the true value, the instrument must be retuned using PPG according to the manufacturer's specifications. Mass assignments of the tuning standard must be within 0.5 amu of the true value. Refer to the instrument manufacturer’s instructions for tuning and conditions. These values are stored in the tune file for future reference.

2. The mass spectral acquisition rate must include a minimum of 10 spectra scans across each chromatographic peak. See the AB Sciex (4500/5500/5500 Plus) Acquisition, Quantitation, Gradient, and detector condition files for the most up to date chromatographic conditions. Modifications to these conditions can be made at the discretion of the analyst to improve resolution or the chromatographic process.

3. Example acquisition method: See *Attachment 03*. Mass Transitions: See *Attachment 01*.

4. Instrument Sensitivity Check (ISC) and Instrument Blanks
   a. Prior to sample analysis, an instrument sensitivity check (ISC) must be performed. The ISC standard concentration must be at the LOQ. The CAL1 standard's concentration is at the LOQ. The CAL1 standard will be analyzed. All target analyte concentrations must be within ±30% of their true values. The signal-to-noise ratio must be greater than or equal to 3:1 for the quantitation ions and confirmation ions, and 10:1 for quantitation ions that have no confirmation ion. If the criteria is not met, correct problem and rerun ISC. If problem persists, repeat the ICAL. No samples can be analyzed until the ISC meets acceptance criteria.

b. Instrument blanks need to be analyzed immediately following the highest standard analyzed and daily or at the start of a sequence. The concentration of all analytes must be less than or equal to the MDL. If acceptance criteria are not met, the calibration must be performed using a lower concentration standard for the high standard until the criteria are met.

5. Load sample vials containing standards, quality control samples, and sample extracts into autosampler tray. Allow the instrument adequate time to equilibrate to ensure the mass spec and LC have reached operating conditions (approximately 1 minutes) before the first injection. Analyze several (at least 3) solvent blanks clean the instrument prior to sample acquisition.

6. After the initial calibration and when analyzing samples within the same tune, inject an instrument blank, followed by the ICV, bile salts marker (WDM), instrument sensitivity check, CCV standard using the CAL4, qualitative identification standard (includes Bile Salt RT marker), Instrument blank, extraction batch QC, and samples. Bracket each set of ten samples with a CCV standard at the CAL4 level, followed by an instrument blank.

   Example Sample Sequence:
   1. Instrument blank
   2. Instrument blank
   3. Instrument blank
   4. Instrument Sensitivity Check (CCV LOW_CAL1)
   5. CCV MID_CAL4
   6. Bile Salts marker (WDM)
   7. Instrument Blank (ICB)
   8. Method Blank (MB)
   9. Low Level LCS (LLCS)
   10. LCS
   11. Sample (10 or less)
   12. CCV MID_CAL4
   13. Instrument Blank

7. After injections are completed, check all CCV recoveries and absolute areas to make sure they are within method control limits. See Calibration section B.2 for acceptance criteria. Process each chromatogram and closely evaluate all integrations, baseline anomalies, and retention time differences. If manual integrations are performed, they must be documented and a reason given for the change in integrations. The manual integrations are documented during data processing and all original integrations are reported at the end of the sample PDF file with the reason for manual integration clearly listed.

   Most PFAS compounds are manufactured by one of two processes, ECF or fluorotelomerization. One gives rise to linear PFAS only while the other process produces both linear and branched isomers. Both branched and linear PFAS compounds can potentially be found in the environment.
   All chromatographic peaks observed in the standard must be integrated and the areas totaled. Chromatographic peaks in the sample must be integrated in the same way as the calibration standard and concentrations reported as a total for each of these analytes. Any branched isomers in samples that elute before the branched isomers present in the calibration standards must not be included in the sample area response

8. Quantitate results for the extraction blank. No target analytes at or above the reporting limit, at or greater than one-third the regulatory compliance limit, at or greater than one-tenth the concentration in a sample in the extraction batch, whichever is greatest, may be found in the extraction blank for acceptable batch results. If this criteria is not met, the samples must be re-extracted.

9. Calculate the recoveries of spiked analytes for the LLCS, LCS, matrix spike and matrix spike duplicate (MS/MSD) by comparing concentrations observed to the true values.

   a. LLCS, LCS, MS, extraction standard recoveries and RPDs are calculated and compared to the limits stored on the LIMS.

   b. If LLCS and LCSD recoveries are acceptable, proceed to sample quantitation.

   c. If the LCS recoveries are above QC acceptance criteria and there are no detections for the compound(s) in the associated sample(s), the data can be reported with a qualifying comment. In all other cases, the samples associated with the LCS must be re-extracted.

   d. If MS/MSD recoveries are outside QC acceptance criteria, the associated data will be flagged or noted in the comments section of the report.

10.
Calculate the relative percent difference (RPD) between the LCS and LCSD. The RPD must be less than or equal to 30%. If the criteria is not met, re-vial fresh aliquots and re-analyze, if still not met, re-prep and reanalyze LCS/LCSD, associated samples, and batch QC.

11. Isotopically-labeled extraction standards are added to all samples, extraction blank, LLCS/LCS, and MS/MSD prior to extraction. The recovery of the extraction standards should be within QC acceptance criteria. (See Statistical Information/Method Performance section of this SOP.) If the extraction standard recovery(ies) is(are) outside the QC

limit(s), re-vial a fresh aliquot and reanalyze. If the extraction standard recovery(ies) are still outside the QC limit(s), reanalyze the sample at a dilution. If the extraction standard recovery(ies) are still outside the QC limit(s), reextract using a reduced sample volume. If the extraction standard recovery(ies) are still outside the QC limit(s), narrate with an NCM and report the data.

12. Isotopically-labeled injection standards are added to each QC and field sample extract prior to analysis. The absolute areas of the injection standards should be within 50-200% of the average areas measured during the initial calibration. If the internal standards are recovered outside 50-200%, consult a supervisor to determine the appropriate course of action based on batch and sample results.

13. Retention time windows are initially established by injecting solutions containing all compounds. The retention time is then set/updated for all compounds using the midpoint of the ICAL (cal 5) or at the beginning of the analytical sequence using the opening CCV mid. Compare the retention times of all of the analytes, surrogates, and internals standards to the retention time from the initial calibration or the opening CCV mid. The retention times should not vary from the expected retention time by more than

    a. 0.4 minutes for native, EIS and NIS compounds

    b. 0.1 minutes from their analog for native compounds with an exact isotopically-labeled compound

    If the retention time is outside of the criteria, the compound is considered a false positive unless it is a compound with branched isomers. Compounds with branched isomers can vary in intensity of the individual isomers that are used for reporting and must be reviewed and compared to the preceding CCV to determine if it should be reported.

14. Two ion transitions and the ion transition ratio per analyte shall be monitored and documented with the exception of 13C4-PFBA, 13C5-PFPeA, 13C4-PFHpA, 13C8-PFOA, 13C9-PFNA, 13C6-PFDA, 13C7-PFUnA, 13C2-PFDA,13C2-PFDoDA 13C2-PFTeDA, 13C8-PFOSA, D3-NMePFOSA, D5-NEtFOSAA, D3-NMeFOSAA, D5-NEtPFOSA, D7-NMePFOSAE, D9-NEtPFOSAE, 13C3-PFBA, 13C4-PFOA, 13C5-PFNA, 13C2-PFOA, 18O2-PFHxS, PFBA, PFECA F(PFMPA), PFECA A(PFMBA), NMePFOSAE, and NEtPFOSAE or EPA 1633 Table 10, see Attachment 19 . The expected ion ratio for each compound is compared to the midpoint of the calibration (cal 5). When an ion ratio for a compound differs from the expected ion ratio by more than 50%, a qualifier "I" is placed on the raw data and on the sample report. See QC Paradigm for corrective action in prepped samples. Ion ratios must be in control for target analytes in calibration solutions. If they are outside of limits, stop the analysis and correct the issues.

16. If the calculated concentration exceeds the calibration range of the system, determine the appropriate dilution required and dilute the extract using Methanol and adjust the amount of internal standard spike solution in the diluted extract. Select the dilution so that the expected EIS recoveries in the diluted extract are >5%.

    Dilution Example 1/10: Mix 895 µl of Methanol with 100 µl of sample extract and 5 µl of internal standard spike solution. Vortex to mix. Using an auto-pipette, transfer an aliquot of the mixed solution into a labeled auto-sampler vial. Cap and vortex thoroughly to mix.

Calculations

1. Peak Area Ratio

$$\text{Peak Area Ratio} = \frac{\text{Analyte Response}}{\text{Labeled Analyte Response}}$$

2. On-Column Analyte Concentration using average RRF

    On-column Concentration = peak area ratio ÷ AVE RRF

3. On-Column Analyte Concentration using linear curve

    On-column Concentration = (peak area ratio - intercept) ÷ slope

4. Sample Concentration

    Sample concentration (ng/l) = (On-column concentration x Final Sample Volume x DF) ÷ Initial Sample Volume

5. Ion Ratio

ion ratio = (peak area or height of quantifier)/(peak area or height of qualifier)

6. See cross-referenced SOPs for additional calculations used to evaluate the calibrations and quality control samples.

Statistical Information/Method Performance

The LCS(OPR) and LLCS(LLOPR) should contain all compounds of interest. LCS, LLCS, MS, and extraction standard recoveries are compared to the limits stored on the LIMS. These limits are method defined. The LCS(OPR) and LLCS(LLOPR) and their respective EIS limits are from Table 6 and 8 of EPA 1633. See *Attachment 19*. The MS/MSD native recoveries are compared to the OPR limits listed in Table 5 and 7 of EPA Method 1633. See *Attachment 19*. The EIS limits for the MS/MSD, DUP, Method Blank, and samples are listed in Table 6 and 8 from EPA 1633. See *Attachment 19*.

QC parameter	Lower acceptance limit	High acceptance limit
Non-extracted Internal Standard (NIS)	>50% of the average NIS from the initial calibration	200%
Sample/DUP	</=30%	NA

Records of the standard deviation of the percent recovery (SR) of EIS and NIS compounds from samples must be maintained and should be assessed periodically. It is recommended that this assessment is done quarterly. The assessment should be expressed as the average percent recovery +/- 2SR for each isotopically labeled compound, and evaluated at least annually.

Historical data for MS/Ds, LCSs, EIS, is reviewed at least annually. Reporting limits including method detection limits (MDLs) and limits of quantitation (LOQs) are set according to EPA method requirements and are evaluated annually. Refer to the SOP for Determining Method Detection Limits and Limits of Quantitation for specific guidelines and procedures. Updates to the LIMS are made as needed by the QA Department and only as directed by the supervisor.

As MDL studies are run on clean laboratory matrices, statistically derived MDL values could be artificially lower than achievable limits in real world samples. Nominal MDL values, set at no lower than ¼ the calculated and verified Reporting Limit (or Limit of Quantitation) will be used as a method to avoid artificially low bias in MDL studies.

Quality Assurance/Quality Control

For each batch of samples extracted, a method blank, an LCS/LLCS (Milli-Q water, sand or tilapia spiked with all compounds to be determined carried through the entire procedure) must be extracted and analyzed. MS/MSD and/or sample/DUP are extracted only if submitted by the client. A batch is defined as the samples to be extracted on any given day, but not to exceed 20 field samples. If more than 20 samples are prepared in a day, an additional batch must be prepared.

If any client, state, or agency has more stringent QC or batching requirements, these must be followed.

QC Paradigm

Occurrence	Action
Sample recovering outside of method EIS/IDA limits as per Table 6 or 8 of the reference method, dependent upon matrix.	If EIS out check for errors and correct. Re-analyze sample if needed. If EIS out high: ND samples, report and narrate; if detections, but EIS<200% (FTS< 350%) report and narrate; if detections and EIS>200% (FTS> 350%), dilute 10X, re-analyze, report and narrate. If EIS low but > 5% and S/N> 10:1, narrate and report. If EIS <5% then contact client to re-extract at smaller aliquot (billable).
Sample recovering NIS outside of 50-200% of the area of the continuing calibration standard in undiluted	If fails high, check for errors and report. If fails low, re-analyze fresh aliquot of sample. If in control, report. If the failure confirms report

sample extracts and sample extracts that require NIS to be added.	the initial analysis and narrate.
Method blank has target analytes > RL or > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Verify instrument clean (evaluate calibration blank & samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and all samples processed with the contaminated blank.
LLCS or LCS recover outside of method OPR limits as per Table 5 or 7 of the reference method, dependent upon matrix.	Reanalyze LLCS/LCS once. If acceptable, report. Evaluate samples for detections, and LLCS/LCS for high bias. If LLCS/LCS has high bias, and samples non-detect, report and narrate. If LLCS has low bias, or if there are detections for critical chemicals of concern, evaluate and reprep and reanalyze the LLCS and all samples in the associated prep batch for failed analytes, if sufficient sample material is available.
Sample has a compound detection with an ion ratio outside of acceptance window of 50-150% of the ratio in the mid-point calibration standard or daily CCV standard. Applicable for all detected analytes (except PFBA, PFPeA, NMeFOSE, NEtFOSE, PFMPA & PFMBA)	Check for error, if none found report as outlined below. 1) If outside limits and value <RL report as ND at RL. 2) If outside limits, but within 2X rule flag, report and narrate. 3) If ratio outside 2X rule then report as ND at elevated RL, apply G flag and narrate. 4) If ratio out due to branched isomer contribution report as positive with narration. 5) If outside limits (and RT window) due to matrix report as ND at elevated RL, apply G flag and narrate.
Compound recovered above calibration curve	Evaluate for saturation. If present dilute and re-analyze. If not, flag and report.
OPTIONAL: MS/MSD recovery outside of method OPR limits as per Table 5 or 7 of the reference method, dependent upon matrix. RPD > 30%.	OPTIONAL: Evaluate the data, and re-prepare/reanalyze the native sample and MS/MSD pair if laboratory error is indicated. Otherwise, narrate and report.

OPTIONAL: Lab duplicate RPD > 30%	OPTIONAL: Evaluate the data, and re-prepare/reanalyze the native sample and DU pair if laboratory error is indicated. Otherwise narrate and report.

Method Modifications

1. Water samples are extracted at 125mL. Soil samples are extracted at 2g.

2. The SPE cartridge incorporates graphitized carbon. Column washing and elution procedures are modified accordingly. Loose carbon is no longer used.

3. The calibration scheme has been updated to align with the current Eurofins LC/MS-MS instrumentation and sensitivity.

4. Additional analytes have been added.

5. The analytical column, while still C18 based, has been changed.

6. Extraction solvents have been updated to improve method performance.

7. The solid extraction procedure was updated to improve method performance.

Attachment:
Attachment 01 - Mass Transitions (.docx)
Attachment 02 - Standard Relationships (.docx)
Attachment 03 - Acquisition Parameters (.pdf)
Attachment 04 - Example Certificate of Analysis (.pdf)
Attachment 05 - Native PFAS Intermediate A (.pdf)
Attachment 06 - Native PFAS Intermediate B (.pdf)
Attachment 07 - Native PFAS Intermediate M (.pdf)
Attachment 08 - Extraction Standard Mix (.pdf)
Attachment 09 - Internal Standard Mix (.pdf)
Attachment 10 - Initial Calibration Standards Preparation (.pdf)
Attachment 11 - Initial Calibration Standard Concentrations (.pdf)
Attachment 12 - Bile Salt Stock Solutions (.pdf)
Attachment 13 - Bile Salts Working Solution A (.pdf)
Attachment 14 - Bile Salts Working Solution B (.pdf)
Attachment 15 - PFAS Linear Branched Mix A (.pdf)
Attachment 16 - PFAS Linear Branched Mix B (.pdf)
Attachment 17 - Linear Branched Bile Salts Solution (.pdf)
Attachment 18 - ICV Working Standard (.pdf)
Attachment 19 - Tables 5-10 (1633) (.pdf)

Attachment: Attachment 01 - Mass Transitions (docx)
Attachment: Attachment 02 - Standard Relationships (docx)
Attachment: Attachment 03 - Acquisition Parameters (pdf)
Attachment: Attachment 04 - Example Certificate of Analysis (pdf)
Attachment: Attachment 05 - Native PFAS Intermediate A (pdf)
Attachment: Attachment 06 - Native PFAS Intermediate B (pdf)
Attachment: Attachment 07 - Native PFAS Intermediate M (pdf)
Attachment: Attachment 08 - Extraction Standard Mix (pdf)
Attachment: Attachment 09 - Internal Standard Mix (pdf)
Attachment: Attachment 10 - Initial Calibration Standards Preparation (pdf)
Attachment: Attachment 11 - Initial Calibration Standard Concentrations (pdf)
Attachment: Attachment 12 - Bile Salt Stock Solutions (pdf)
Attachment: Attachment 13 - Bile Salts Working Solution A (pdf)
Attachment: Attachment 14 - Bile Salts Working Solution B (pdf)
Attachment: Attachment 15 - PFAS Linear Branched Mix A (pdf)
Attachment: Attachment 16 - PFAS Linear Branched Mix B (pdf)
Attachment: Attachment 17 - Linear Branched Bile Salts Solution (pdf)
Attachment: Attachment 18 - ICV Working Standard (pdf)
Attachment: Attachment 19 - Tables 5-10 (1633) (pdf)

End of document

Version history

Version	Approval	Revision information	
5	06.NOV.2024		
6	06.NOV.2024		
7	22.NOV.2024		

Eurofins Analtical
Reporting Limits (RLs) and Method Detecion Limits (MDLs)

Method Description	Analyte Description	CAS Number	RL	MDL	Units
PFAS (Soil)	Perfluorobutanoic acid (PFBA)	375-22-4	0.800	0.200	ug/Kg
	Perfluoropentanoic acid (PFPeA)	2706-90-3	0.400	0.100	ug/Kg
	Perfluorohexanoic acid (PFHxA)	307-24-4	0.200	0.0500	ug/Kg
	Perfluoroheptanoic acid (PFHpA)	375-85-9	0.200	0.0500	ug/Kg
	Perfluorooctanoic acid (PFOA)	335-67-1	0.200	0.0500	ug/Kg
	Perfluorononanoic acid (PFNA)	375-95-1	0.200	0.0500	ug/Kg
	Perfluorodecanoic acid (PFDA)	335-76-2	0.200	0.0500	ug/Kg
	Perfluoroundecanoic acid (PFUnA)	2058-94-8	0.200	0.0500	ug/Kg
	Perfluorododecanoic acid (PFDoA)	307-55-1	0.200	0.0500	ug/Kg
	Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.200	0.0500	ug/Kg
	Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.200	0.0500	ug/Kg
	Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.200	0.0500	ug/Kg
	Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	0.200	0.0500	ug/Kg
	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.200	0.0500	ug/Kg
	Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	0.200	0.0500	ug/Kg
	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.200	0.0500	ug/Kg
	Perfluorononanesulfonic acid (PFNS)	68259-12-1	0.200	0.0500	ug/Kg
	Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	0.200	0.0500	ug/Kg
	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	0.800	0.200	ug/Kg
	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	0.800	0.200	ug/Kg
	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	0.800	0.200	ug/Kg
	Perfluorooctanesulfonamide (PFOSA)	754-91-6	0.200	0.0500	ug/Kg
	N-methylperfluorooctane sulfonamide (NMeFOSA)	31506-32-8	0.200	0.0500	ug/Kg
	N-ethylperfluorooctane sulfonamide (NEtFOSA)	4151-50-2	0.200	0.0500	ug/Kg
	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.200	0.0500	ug/Kg
	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.200	0.0500	ug/Kg
	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	24448-09-7	2.00	0.500	ug/Kg
	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	1691-99-2	2.00	0.500	ug/Kg
	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	0.800	0.200	ug/Kg
	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	0.800	0.200	ug/Kg
	Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	0.400	0.100	ug/Kg
	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	0.400	0.100	ug/Kg
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	0.800	0.200	ug/Kg
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	0.800	0.200	ug/Kg
	Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	0.400	0.100	ug/Kg
	3-Perfluoropropylpropanoic acid (3:3 FTCA)	356-02-5	1.00	0.250	ug/Kg
	3-Perfluoropentylpropanoic acid (5:3 FTCA)	914637-49-3	5.00	1.25	ug/Kg
	3-Perfluoroheptylpropanoic acid (7:3 FTCA)	812-70-4	5.00	1.25	ug/Kg
	13C4 PFBA	STL00992	2.50		ug/Kg
	13C5 PFPeA	STL01893	1.25		ug/Kg
	13C5 PFHxA	STL02577	0.625		ug/Kg

Method Description	Analyte Description	CAS Number	RL	MDL	Units
PFAS (Soil)	13C4 PFHpA	STL01892	0.625		ug/Kg
	13C8 PFOA	STL01052	0.625		ug/Kg
	13C9 PFNA	STL02578	0.313		ug/Kg
	13C6 PFDA	STL02579	0.313		ug/Kg
	13C7 PFUnA	STL02580	0.313		ug/Kg
	13C2 PFTeDA	STL02116	0.313		ug/Kg
	13C3 PFBS	STL02337	0.583		ug/Kg
	13C3 PFHxS	STL02581	0.593		ug/Kg
	13C8 PFOS	STL01054	0.600		ug/Kg
	13C8 PFOSA	STL01056	0.625		ug/Kg
	d3-NMeFOSAA	STL02118	1.25		ug/Kg
	d5-NEtFOSAA	STL02117	1.25		ug/Kg
	M2-4:2 FTS	STL02395	1.17		ug/Kg
	M2-6:2 FTS	STL02279	1.19		ug/Kg
	M2-8:2 FTS	STL02280	1.20		ug/Kg
	13C3 HFPO-DA	STL02255	2.50		ug/Kg
	d7-N-MeFOSE-M	STL02277	6.25		ug/Kg
	d9-N-EtFOSE-M	STL02278	6.25		ug/Kg
	d5-NEtPFOSA	STL02704	0.625		ug/Kg
	D3-NMeFOSA	STL02705	0.625		ug/Kg
	13C3-PFBA	STL02680	1.25		ug/Kg
	13C4 PFOA	STL00990	0.625		ug/Kg
	13C2 PFDA	STL00996	0.313		ug/Kg
	13C4 PFOS	STL00991	0.600		ug/Kg
	13C5 PFNA	STL00995	0.313		ug/Kg
	13C2 PFHxA	STL00993	0.625		ug/Kg
	18O2 PFHxS	STL00994	0.593		ug/Kg
	Perfluorodecanesulfonic acid (PFDS)	335-77-3	0.200	0.0500	ug/Kg
	Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	0.400	0.100	ug/Kg
	13C2-PFDoDA	STL02703	0.313		ug/Kg

Eurofins Analtical

Reporting Limits (RLs) and Method Detecion Limits (MDLs)

Method Description	Analyte Description	CAS Number	RL	MDL	Units
PFAS (Water)	Perfluorobutanoic acid (PFBA)	375-22-4	8.00	2.13	ng/L
	Perfluoropentanoic acid (PFPeA)	2706-90-3	4.00	1.00	ng/L
	Perfluorohexanoic acid (PFHxA)	307-24-4	2.00	0.500	ng/L
	Perfluoroheptanoic acid (PFHpA)	375-85-9	2.00	0.500	ng/L
	Perfluorooctanoic acid (PFOA)	335-67-1	2.00	0.500	ng/L
	Perfluorononanoic acid (PFNA)	375-95-1	2.00	0.500	ng/L
	Perfluorodecanoic acid (PFDA)	335-76-2	2.00	0.500	ng/L
	Perfluoroundecanoic acid (PFUnA)	2058-94-8	2.00	0.500	ng/L
	Perfluorododecanoic acid (PFDoA)	307-55-1	2.00	0.500	ng/L
	Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2.00	0.500	ng/L
	Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2.00	0.500	ng/L
	Perfluorobutanesulfonic acid (PFBS)	375-73-5	2.00	0.500	ng/L
	Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	2.00	0.500	ng/L
	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	2.00	0.517	ng/L
	Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	2.00	0.500	ng/L
	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	2.00	0.500	ng/L
	Perfluorononanesulfonic acid (PFNS)	68259-12-1	2.00	0.500	ng/L
	Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	2.00	0.500	ng/L
	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	8.00	2.00	ng/L
	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	8.00	2.00	ng/L
	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	8.00	2.00	ng/L
	Perfluorooctanesulfonamide (PFOSA)	754-91-6	2.00	0.500	ng/L
	N-methylperfluorooctane sulfonamide (NMeFOSA)	31506-32-8	2.00	0.500	ng/L
	N-ethylperfluorooctane sulfonamide (NEtFOSA)	4151-50-2	2.00	0.500	ng/L
	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	2.00	0.620	ng/L
	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	2.00	0.521	ng/L
	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	24448-09-7	20.0	5.00	ng/L
	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	1691-99-2	20.0	5.00	ng/L
	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	8.00	2.00	ng/L
	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	8.00	2.00	ng/L
	Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	4.00	1.00	ng/L
	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	4.00	1.22	ng/L
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	8.00	2.00	ng/L
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	8.00	2.00	ng/L
	Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	4.00	1.00	ng/L
	3-Perfluoropropylpropanoic acid (3:3 FTCA)	356-02-5	10.0	2.50	ng/L
	3-Perfluoropentylpropanoic acid (5:3 FTCA)	914637-49-3	50.0	12.5	ng/L
	3-Perfluoroheptylpropanoic acid (7:3 FTCA)	812-70-4	50.0	14.9	ng/L
	13C4 PFBA	STL00992	100		ng/L
	13C5 PFPeA	STL01893	5.00		ng/L
	13C5 PFHxA	STL02577	25.0		ng/L

Eurofins Analtical
Reporting Limits (RLs) and Method Detecion Limits (MDLs)

Method Description	Analyte Description	CAS Number	RL	MDL	Units
PFAS (Water)	13C4 PFHpA	STL01892	25.0		ng/L
	13C8 PFOA	STL01052	25.0		ng/L
	13C9 PFNA	STL02578	12.5		ng/L
	13C6 PFDA	STL02579	12.5		ng/L
	13C7 PFUnA	STL02580	12.5		ng/L
	13C2 PFTeDA	STL02116	12.5		ng/L
	13C3 PFBS	STL02337	24.0		ng/L
	13C3 PFHxS	STL02581	24.0		ng/L
	13C8 PFOS	STL01054	25.0		ng/L
	13C8 PFOSA	STL01056	25.0		ng/L
	d3-NMeFOSAA	STL02118	50.0		ng/L
	d5-NEtFOSAA	STL02117	50.0		ng/L
	M2-4:2 FTS	STL02395	50.0		ng/L
	M2-6:2 FTS	STL02279	50.0		ng/L
	M2-8:2 FTS	STL02280	50.0		ng/L
	13C3 HFPO-DA	STL02255	100		ng/L
	d7-N-MeFOSE-M	STL02277	250		ng/L
	d9-N-EtFOSE-M	STL02278	250		ng/L
	d5-NEtPFOSA	STL02704	25.0		ng/L
	D3-NMeFOSA	STL02705	25.0		ng/L
	13C3-PFBA	STL02680	5.00		ng/L
	13C4 PFOA	STL00990	25.0		ng/L
	13C2 PFDA	STL00996	12.5		ng/L
	13C4 PFOS	STL00991	24.0		ng/L
	13C5 PFNA	STL00995	12.5		ng/L
	13C2 PFHxA	STL00993	25.0		ng/L
	18O2 PFHxS	STL00994	24.0		ng/L
	Perfluorodecanesulfonic acid (PFDS)	335-77-3	2.00	0.500	ng/L
	Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	4.00	1.00	ng/L
	13C2-PFDoDA	STL02703	12.5		ng/L

APPENDIX F

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

FOR THE

BELLE HARBOR SHOPPING CENTER
BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Prepared for:
The Great Atlantic & Pacific Tea Company
Montvale, New Jersey

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July 2010

COMMUNITY AIR MONITORING PLAN
FOR THE
BELLE HARBOR SHOPPING CENTER
BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

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1.0 PURPOSE

The purpose of this Community Air Monitoring Plan (CAMP) is to provide an additional margin of safety to residents and/or businesses located in the vicinity of the Belle Harbor Shopping Center (Site) located at 112-15 Beach Channel Drive in the Far Rockaway section of Queens, New York. The site, approximately 5 acres in size, currently consists of a shopping center building of approximately 57,000 square feet with tenant retail commercial operations. The remaining approximate 3.7 acres of the site is paved. The location of the Site is shown on Figure 1. Dust and volatile compounds may be generated during proposed investigation activities at the Site.

This CAMP is designed to conform to the Generic Community Air Monitoring Plan (Appendix D of the New York State Department of Environmental Services Department of Environmental Remediation's Voluntary Cleanup Program Guide (VCPG May 2002)).

The compounds of concern at the Site are soils potentially impacted with polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs). Soil samples collected and submitted for laboratory analyses during previous investigation work at the Site detected levels of PAHs ranging from 0.1 ppm to 7.1 ppm. Total VOCs in similarly-placed soils were reported at levels ranging up to 0.7 ppm (1, 2, 4,-Trimethylbenzene). The potential impact to nearby residents and/or businesses may be generated from fugitive dust, which may become airborne as a result of the investigation activities noted below.

The proposed investigation activities depicted on Figure 2 are briefly described below.

- install up to four (4) monitoring wells at the Site for the purpose of delineating the impact of PAHs and VOCs in soils and groundwater.

A Site-specific Environmental, Health and Safety Plan (EHASP) and a Quality Assurance/Quality Control Plan (QA/QCP) have also been developed to address the proposed activities listed above. The EHASP outlines the guidelines and requirements for the safety of on- and off-site personnel and visitors to the Site involved in the proposed investigation field activities. The QA/QCP details the quality assurance measures to be implemented during this project.

2.0 MONITORING PLAN

This section describes air monitoring, action levels, and responses for the CAMP at the perimeter of the Site and off-site neighborhood monitoring. Air monitoring for the Site and the surrounding neighborhood will occur during all proposed investigation activities. CAMP results for odor, vapor, dust, and control measures will be submitted to the NYSDEC and NYSDOH on a weekly basis.

The community air monitoring network will consist of one photoionization detector (PID) for monitoring total VOCs and two particulate/dust monitors. The PID meter will be used to record the background or upwind VOC levels prior to beginning each day's work and then placed at the downwind perimeter of the work areas for continuous, real-time recording throughout the work day. The two dust monitors will be placed one upwind and one at the downwind perimeter of the work area for continuous monitoring. The upwind location will be determined prior to beginning each day's work. The downwind perimeter will be considered just beyond the immediate work areas. (i.e. just beyond the drill rig while advancing each well).

2.1 Continuous VOC Monitoring

Total VOC concentrations will be monitored at the downwind perimeter of the work areas on a continuous basis. The PID meter (Photovac Micro-tip or equivalent) will be operated daily, beginning each morning prior to the start-up of work activities and ending each afternoon following the completion of the day's work. Readings will be collected continuously. Fifteen-minute averages will also be collected. All readings will be recorded and downloaded at the end of each day. An action level of 5 ppm (parts per million) above the background or upwind reading has been specified in the VCPG's community air monitoring plan and will be utilized by Stantec at this Site.

The Stantec on-site representative will review the data from the downwind perimeter PID meter every 15 minutes. The data will be evaluated for the following:

A) If the VOC concentrations at the downwind perimeter of the work area do not exceed 5 ppm above background then investigation work activities will continue unabated.

B) If the VOC concentrations at the downwind perimeter of the work area exceed 5 ppm above background, for a 15-minute interval, investigation work activities will be stopped and monitoring continued as described below:

- If the organic vapor levels decrease at the downwind perimeter of the work area, per instantaneous readings, to below 5 ppm above background, investigation work activities will resume.

- If the organic vapor levels at the downwind perimeter of the work area, per instantaneous readings, remain greater than 5 ppm over background but less than 25 ppm over background, investigation work activities can resume provided:

    - The source of organic vapors is identified and corrective actions are taken to abate the emissions (see below).

- The organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background for the 15-minute interval.

C) If the concentration at the downwind perimeter of the work area, for a fifteen-minute average reading, exceeds 25 ppm above background, investigation work activities will be shut down and corrective actions will be taken to abate the emissions.

Abatement measures are identified below.

<u>During Monitoring Well Installation</u>

- During saw cutting of asphalt and/or concrete at ground surface, the surface will be wetted down to minimize the generation of dust.

- The soil and concrete that is generated will be placed in 55-gallon steel drums, and temporarily staged on Site before being transported off-site for proper disposal.

- If the soil boring being advanced is near the proposed finished depth at the end of the workday, the boring will be continued to the finished depth (approximately 13 and 40 ft bgs for monitoring wells), the tools will be pulled and the well will be installed with the proper filter sand and seals (two-foot bentonite seal and cement-bentonite grout).

- If the boring is not near the proposed completion depth at the end of the workday, then the excess soil will be placed in a 55-gallon drum, and temporarily staged on Site before being transported off-site for proper disposal. Boring advancement will cease, the tools will be removed, the borehole will be backfilled with clean sand, and the downwind perimeter will be monitored for 30 minutes. If the downwind VOC levels drop to less than 5 ppm above background, boring advancement will re-commence. If the downwind VOC levels do not drop to less than 5 ppm above background, the ground surface will be sealed with concrete, and the work stopped for the day and/or until the issue is mitigated.

Based on previous investigative work on the adjacent property, VOC concentrations are anticipated to be at a low concentration and not anticipated to exceed the 5 ppm above background action level. However, the above-mentioned action items will be implemented if the readings exceed the 5-ppm action level.

2.2 Continuous Dust Monitoring

Each respirable dust monitor (MIE Brand, pDR-1000AN Modelor, or equivalent) will be operated daily, beginning each morning with the start-up of monitoring well installation activities and ending each afternoon following the completion of the day's work. Readings will be collected continuously. Fifteen-minute averages will also be collected. All readings will be recorded and downloaded at the end of each day. Action levels of 100 and 150 $\mu g/m^3$ (micrograms per cubic meter) above background or upwind has been specified in the VCPG's community air monitoring plan and will be utilized by Stantec at this Site.

The Stantec on-site representative will review the data from the downwind perimeter dust meter every 15 minutes. The data will be evaluated for the following:

A) If the downwind perimeter particulate level does not exceed 100 μg/m^3 above background, for a 15-minute interval, then investigation work activities will continue unabated.

B) If the downwind perimeter particulate level is 100 μg/m^3 greater than the upwind location, for a 15-minute interval, then dust suppression activities will be undertaken (see below). Work will continue with dust suppression provided that the downwind particulate levels do not exceed 150 μg/m^3 greater than the upwind location and provided that no visible dust is migrating from the work area.

C) If, after re-starting work and dust suppression activities, the downwind perimeter particulate levels are greater than 150 μg/m^3 above the upwind level, work will be stopped for the day and corrective actions taken to abate the emissions.

Dust suppression techniques are identified below.

<u>During Monitoring Well Installation</u>

Stantec will mist the hollow stem augers with potable water using a portable 3 to 5-gallon garden sprayer to decrease the airborne dust production. During the saw cutting of the concrete sidewalk, the surface will be wetted with water to minimize the generation of airborne dust. Stantec will continue to evaluate the data from each dust monitor.

FIGURES

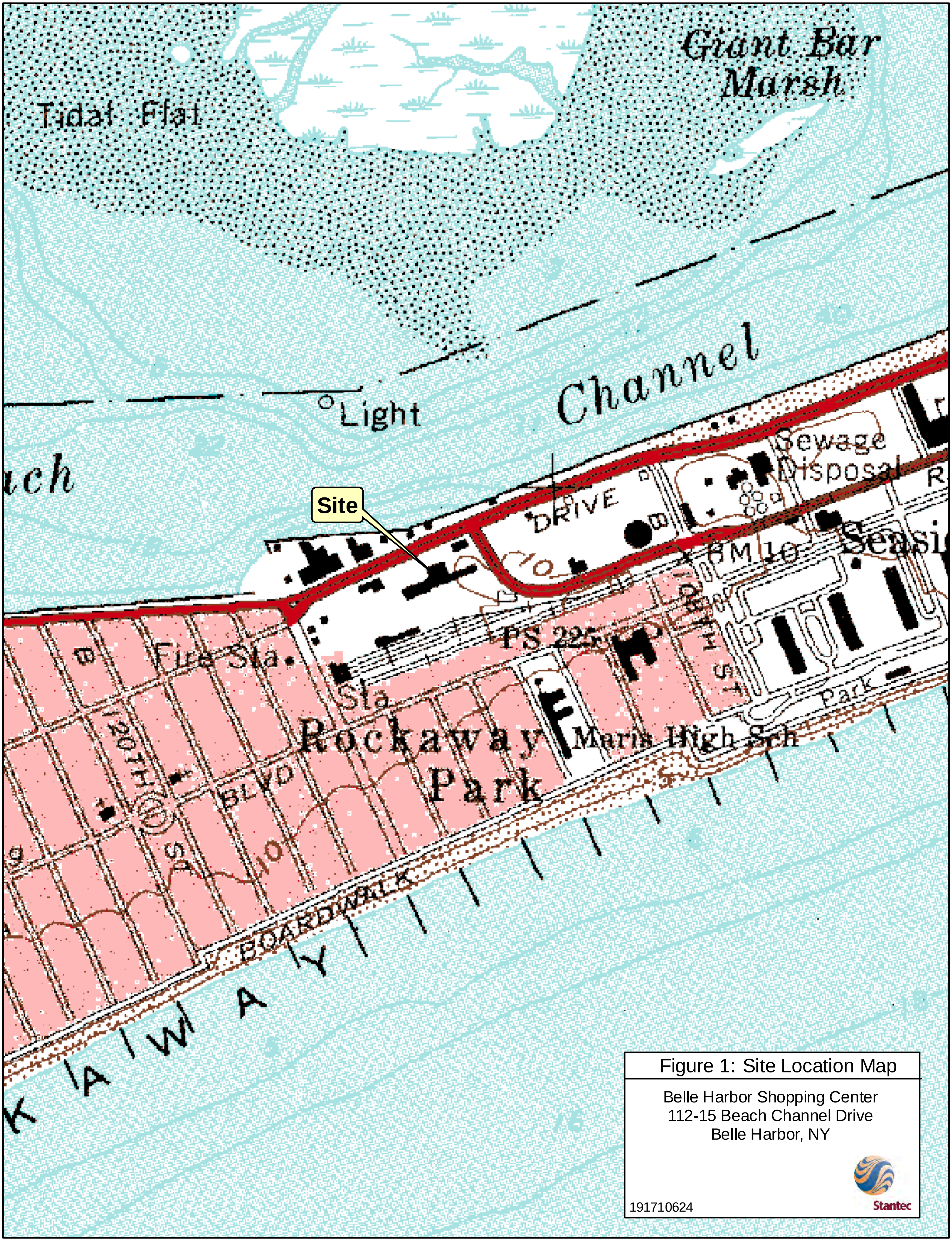

Figure 1: Site Location Map

Belle Harbor Shopping Center
112-15 Beach Channel Drive
Belle Harbor, NY

191710624

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Legend

- APBH-1 — PREVIOUS MALCOLM PIRNIE BORING (KNOWN LOCATION)
- APBHS-1 — PREVIOUS MALCOLM PIRNIE BORING (APPROXIMATE LOCATION)
- MW-1 — MONITOR WELL
- IAQ-1 — INDOOR AIR QUALITY/AMBIENT AIR SAMPLE
- SG-01 — SOIL GAS VAPOR SAMPLE (JUNE 2008)
- SG-01 — SOIL GAS VAPOR SAMPLE (PRE-2008 SAMPLES)
- HRC INJECTION AREA
- HRC INJECTION POINT
- PROPOSED INDOOR AIR SAMPLE
- PROPOSED SOIL VAPOR SAMPLE
- PROPOSED MONITORING WELL

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC.

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name:	KJS	RN	RN	10.07.15
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

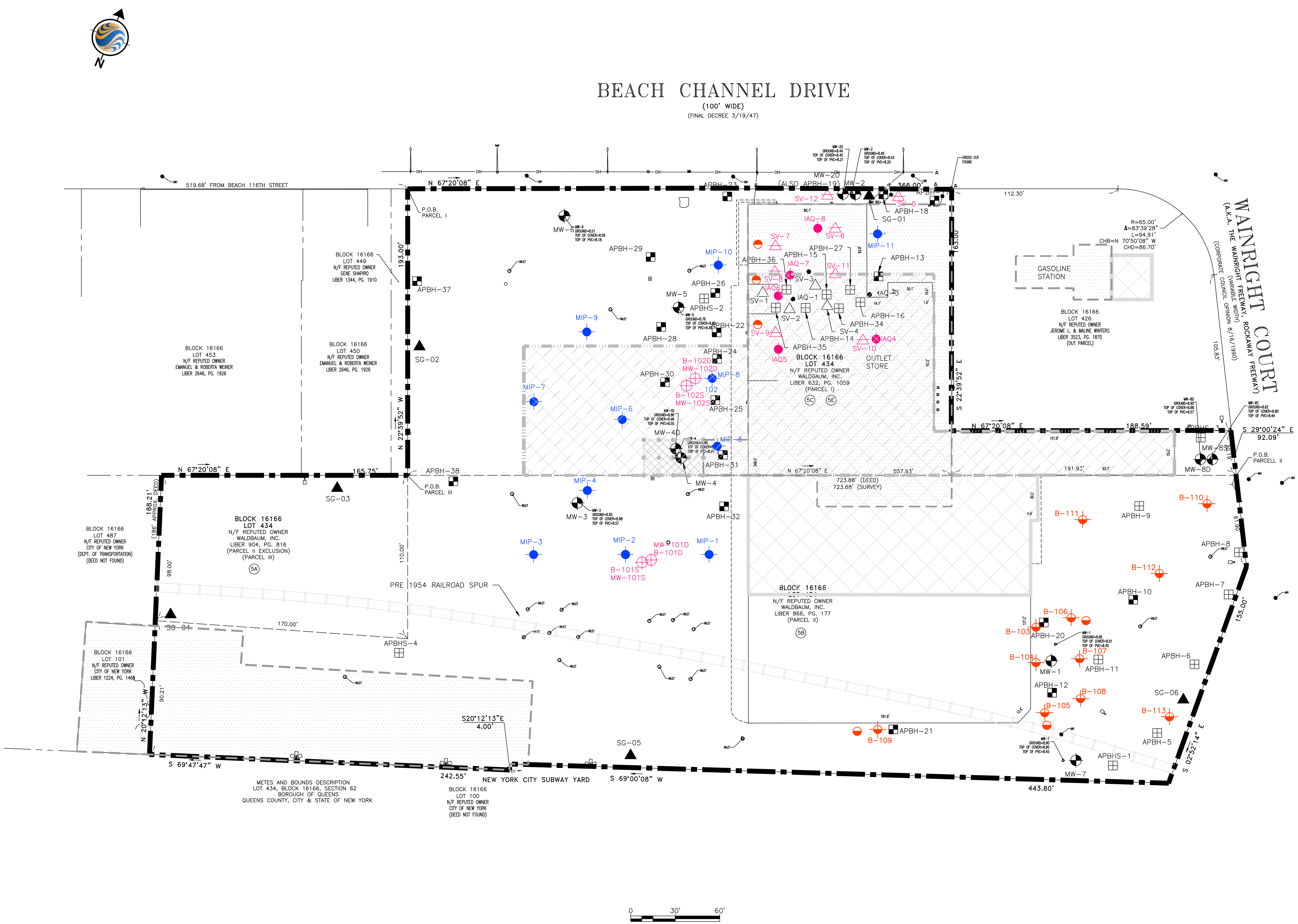
Client/Project

BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS, (FAR ROCKAWAY), NEW YORK

Title

FIGURE 4 - 2010 SAMPLING LOCATION PLAN

Project No.	Scale	
191710624	1"=30'	
Drawing No.	**Sheet**	**Revision**
4		0



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- SG-01 — PREVIOUS SOIL GAS VAPOR SAMPLE (PRE-2008 SAMPLES)
- PREVIOUS HRC INJECTION AREA
- PREVIOUS HRC INJECTION POINT
- PROPOSED INDOOR AIR SAMPLE
- PROPOSED SOIL VAPOR SAMPLE
- PROPOSED MONITORING WELL
- MIP GEOPROBE® - MIP-1 THROUGH 11 (MIP-12-18 LOCATIONS HELD IN RESERVE)
- PROPOSED SOIL BORING
- APPROXIMATE LOCATION OF TEMPORARY MONITORING WELL

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC.

- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- VCP SITE BOUNDARIES

Revision	By	Appd.	YY.MM
191710624	JJW	RN	03-2

File Name:	Dwn.	Chkd.	Dsgn.	YY.MM

Permit-Seal

Client/Project

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112-15 BEACH CHANNEL DRIVE
QUEENS, (FAR ROCKAWAY), NEW YORK

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FIGURE 4 - 2010 SAMPLING LOCATION PLAN

Project No.	Scale	
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Drawing No.	**Sheet**	**Revision**
4		1

APPENDIX G

Gantt Schedule Chart

ID	Task	Task Name	Duration	Start	Finish
1		NYSDEC Approval of SRIWP	0 days	Fri 1/10/25	Fri 1/10/25
2		Stantec Completion of Project Preliminary Activit	20 days	Mon 1/13/25	Fri 2/7/25
3		Stantec Completion of Project Set-Up Activities	20 days	Mon 1/27/25	Fri 2/21/25
4		Stantec Mobilization for Project Field Activities	1 day	Mon 3/10/25	Mon 3/10/25
5		Stantec Completion of Drilling, Sampling Point Installation, and Soil/Vapor Sample Collection Activities	4 days	Tue 3/11/25	Fri 3/14/25
6		Laboratory Analysis of Soil/Vapor Samples	15 days	Mon 3/17/25	Fri 4/4/25
7		Stantec Completion of Groundwater Sampling Activities	6 days	Mon 3/31/25	Mon 4/7/25
8		Laboratory Analysis of Groundwater Samples	15 days	Tue 4/8/25	Mon 4/28/25
9		Data Validation of Laboratory Analytical Reports	25 days	Tue 4/29/25	Mon 6/2/25
10		Stantec Development and Issuance of Draft SRIR for NYSDEC Review	35 days	Mon 6/2/25	Fri 7/18/25

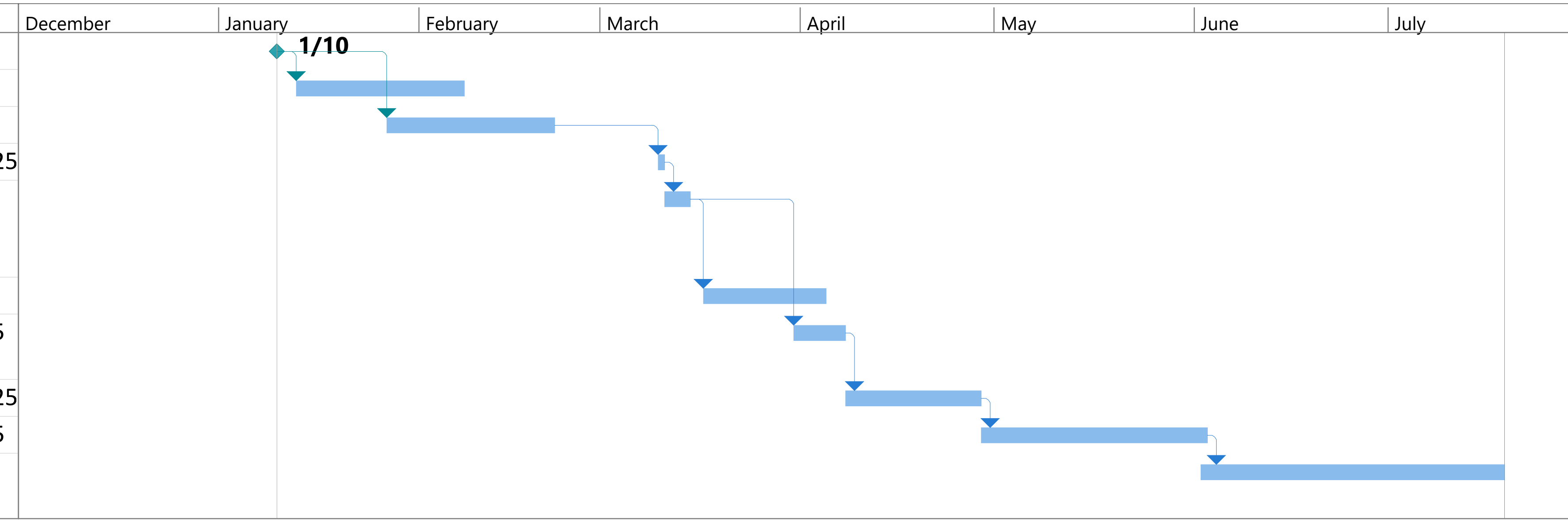

Figure 7
Project Schedule
Belle Harbor SRIWP

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress