Remedial Action 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.

November 30, 2018

Insert revision record

Sign-off Sheet

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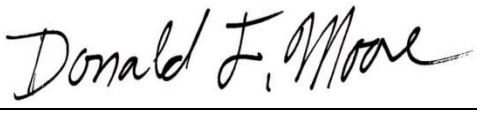
Prepared by  (signature)

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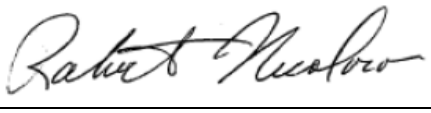
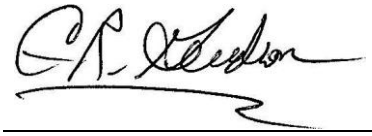
Reviewed by  (signature)

Robert Nicoloro

Sign-off Sheet

CERTIFICATION

I, Craig R. Gendron certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Remedial Action 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).



11/28/2018

Signature Date

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1.0 INTRODUCTION

In accordance with the New York State Department of Environmental Conservation's (NYSDEC) Brownfield Cleanup Program (BCP) and DER-10, *Technical Guidance for Site Investigation and Remediation,* (May 2010), Stantec Consulting Services Inc. (Stantec) has prepared this Remedial Action Work Plan (RAWP) for the Belle Harbor Shopping Center site (the property and/or Site) located in the Town of Belle Harbor (Queens), Queens County, New York. The location of the property is shown on Figure 1. The property is owned by Benenson Belle Harbor, LLC, which leases a grocery store in the shopping center to Ahold U.S.A. Inc (Ahold).

The grocery store had been leased by the Great Atlantic & Pacific Tea Company, Inc. (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 and the NYSDEC subsequently entered the Site into the BCP on December 8, 2017 (Site # C241048). Ahold/Stop & Shop retained Stantec as environmental professional for this Site.

This RAWP has been developed on behalf of Ahold to describe actions to remediate subsurface soils, groundwater, and soil vapor that have been impacted with chlorinated volatile organic compounds (cVOCs), and soils and groundwater that have been impacted with Manufactured Gas Plant (MGP) related materials from past operations and land use in the area. The cVOC impacted materials are found at two areas of concern at the Site and the MGP impacted materials are found at one area of concern at the Site, as noted below. Remedial investigation work was conducted at the Site from 2001 to 2018. A complete Remedial Investigation Report (RIR) was submitted in February 2018. For the purpose of the environmental investigations and evaluation of remedial action alternatives, the property is described in reports as having three areas of concern, each of which will be address for appropriate remedial actions for soil, groundwater, and potential vapor intrusion. Those three areas of concern are as follows:

1. The western portion of the property, which encompasses the Former Bell Boy Cleaners, Sofia Nails unit, the "former vacant" unit which is now a liquor store, and the grocery store unit. The are also includes the area of the former dry cleaners building, now demolished and paved over, as well as the rest of the paved land to the west of the building;

2. The southern (or southeastern) portion of the property, which encompasses the paved land south of the grocery store unit, the grocery store unit itself, and the paved lot to the rear of, or east of, the grocery unit up to Wainright Court, including the area where monitoring wells MW-8S and MW8d are located as shown in Figure 2; and

3. The northern portion of the property which encompasses the area from Ciros Pizza unit, the Citibank Unit, the paved lot to the rear of these units, the narrow paved area between the

bank and Beach Chanel Drive and the paved lot in front of, or west and north of, the bank and pizza units.

As noted above, area of concern #1 (hereinafter referred to as the Western area) is located in the parking lot on the western side of the existing shopping center, where a portion of the original shopping center was once located (and subsequently demolished). The contaminants of concern are cVOCs. Historical data suggest that soils and groundwater have been impacted by a release of dry cleaning solvents associated with a former dry cleaner that was located within this western portion of the original shopping center. Additional investigation data indicate that sub-slab vapor is impacted with cVOCs underlying a portion of the grocery store in close proximity to this area.

Area of concern #2 (hereinafter referred to as the Southern or Southeastern area) is located in the southeastern portion of the property. The contaminants of concern are related to MGP residuals. Investigation work in this area was conducted as a follow-up to, or in conjunction with, remedial investigations and actions being undertaken simultaneously by others at an off-Site property. This off-Site property is an electrical substation and former MGP property that was located immediately to the east of the subject property. This portion of the subject Site is periodically referred to as the southeastern area, rear parking lot area, or loading dock area. National Grid, through an agreement with the Ahold, will complete the planned remedial action for this portion of the property. See Appendix A for GEI Consultants, Inc. (GEI) detailed plans.

Area of concern #3 (hereinafter referred to as the Northern area) is located in the northern portion of the existing shopping center building. The contaminants of concern are also cVOCs. The historical data suggest that soils, groundwater, and sub-slab vapors have been impacted by a release of dry cleaning solvents that were associated with a former dry cleaner that was located within one of the retail lease units. This unit was leased by the now former Bell Boy Dry Cleaner and is now leased by Sofia's Nail Salon.

Stantec has been retained by Ahold to develop this RAWP and to implement it upon regulatory approval. The actions planned under the RAWP are designed to address impacted soils, groundwater, and sub-slab soil vapors. The RAWP, presented herein, includes the following elements:

- A summary of Site characteristics and history;
- A summary of investigative activities performed, and contaminants identified at the various Areas of Concern during the Remedial Investigation (RI);
- A description of Interim Remedial Measures (IRMs) performed;
- Remedial Action Goals for the Site;
- A Remedial Action Work Plan summarizing final remedial actions; and
- Institutional, and potential future, Engineering Controls.

2.0 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The subject property 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 subject property 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. The shopping center is currently active and, at the time of the investigation work, was occupied by a Waldbaum's Supermarket, a Liquor Store – Liquor Wine Warehouse, Sofia's Nail Salon (formerly Bell Boy Dry Cleaners), Ciros Pizza, and a Citibank branch bank. The grocery store is now a Stop & Shop Grocery Store.

The property 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 MGP is located immediately to the east of the subject property 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

It is reported that the current building footprint is different now than it was in the past. An aerial photo from 1966 depicts the original building running east to west parallel to Beach Channel Drive. A gasoline station currently located at the northeast corner of the block is evident in 1966 and as far back as 1954. The aerial photos also show a rail spur and building structure located within the south boundary of the property 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 property boundary. 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 sampling locations. Figure 3 shows the lease units and various sampling locations located in the northern portion of the existing building.

2.3 PHYSICAL SETTING

Surface topography at the property 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.

2.4 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, soils encountered consisted of fine sand. Bedrock was not encountered in any of the borings drilled at this Site.

2.5 HYDROLOGY

Details of the Site's hydrogeology (including additional tables and figures) are presented in the RIR and briefly described below. Depths to groundwater, as measured in Site monitoring wells, typically range from five to seven feet bls. Well descriptions 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 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 ft/ft. A groundwater mound is depicted in the vicinity of MW-102S.

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. Groundwater in the shallow overburden is shown to flow to the north-northeast during both low and high tides. During both tides, a groundwater mound in the approximate enter 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 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.

2.6 APPLICABLE STANDARDS

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

Soil. 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 the Inactive Hazardous Waste Disposal Site Remediation Program, the Brownfield Cleanup Program, Voluntary Cleanup Program, and the Spill Response Program). This guidance replaces Technical Administrative Guidance Memorandum ("TAGM") 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, dated January 24, 1994.

Therefore, in accordance with NYSDEC Policy – CP-51/Soil Cleanup Guidance, the reported analytical concentrations for the analyzed constituents detected in soil at the property were compared to the commercial Soil Cleanup Objectives (SCOs) provided in 6 NYCCR Table 375-6.8(b). As described in the CP-51/Soil Cleanup Guidance (Section V, F) "the SCOs may be used to identify areas of soil contamination and to determine the extent of soil contamination, and that the exceedance of one or more applicable SCOs or Supplemental SCOs (which is the lower of protection of public health, protection of groundwater, or protection of ecological resources soil cleanup objectives) alone does not trigger the need for remedial action, define "unacceptable" levels of contaminants in soil, or indicate that a site qualifies for any NYSDEC remedial program."

Groundwater. Groundwater analytical results were used to evaluate the groundwater quality at the Site. Groundwater standards from NYSDEC Part 703 and TOGS 1.1.1 (the "Standards") were used as the cleanup goals for groundwater at the Site.

Free Product. There are no promulgated free product cleanup standards in New York State. Therefore, the NYSDEC Division of Environmental Remediation Spill Response Guidance Policy – Spill Guidance Manual Section 1.6-Technical Field Guidance Corrective Action is used to evaluate investigation results and potential remediation of free product at MW-1. The primary action in this guidance is product recovery. The objectives of a product-recovery operation are to (i) recover as much product to the extent practical, (ii) to complete the recovery operation over a short duration, and (iii) to control the potential migration of product onto, or from, the Site. The presence and/or absence of free product will be evaluated based on field gauging activities. The gauging of all monitoring wells will be used to evaluate the effectiveness of the remedial actions described herein.

Soil Vapor. The current NYSDOH guidance document entitled "Final 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) were used to evaluate soil vapor, sub-slab vapor, and indoor air quality data and were used as an additional means to evaluate the need (or not) for vapor remedial action(s).

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

Previous site investigation activities are described in, or included by reference in, the following reports submitted to DER.

- Site investigations initiated by Malcolm Pirnie, Inc. (MPI) from November 2000 to February 2001 to evaluate potential impact 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.
- A Site-Specific Health and Safety plan (HASP) and Quality Assurance/Quality Control (QA/QC) and Sampling & Analyses Plan dated March 1, 2002.
- An investigation report dated May 2003.
- A follow-up investigation by Whitestone Associates, Inc. completed between May 2004 and June 2004.
- A Supplemental Remedial Investigation Report & Remedial Investigation/Corrective Action Work Plan dated August 2004.
- Correspondence dated August 29, 2007, October 9, 2007, and May 7, 2008, associated with comments to the August 2004 Supplemental Remedial Investigation Report & Remedial Investigation/Corrective Action Work Plan.
- Supplemental Remedial Investigation/Interim Corrective Action Report & Remedial Investigation/Corrective Action Work Plan, dated December 26, 2008.
- Supplemental Remedial Investigation/Pilot Test Report & Remedial Investigation/Corrective Action Work Plan, dated January 12, 2009.
- Response to April 30, 2009 NYSDEC Comment Letter prepared by Whitestone, dated May 28, 2009.
- Interim Remedial Measures Construction Completion Report, dated June 28, 2013.
- Manufactured Gas Plant-Related Residuals Investigation Report, dated October 2013.
- Draft Supplemental Remedial Investigation Report, dated July 28, 2014.
- Draft Remedial Investigation Report, dated February 12, 2018.

These documents were made available to Stantec and subsequently reviewed to develop the following description of the Site.

As part of a property transaction, initial environmental investigations were undertaken by Malcolm Pirnie, Inc. (MPI) in 2000 and 2001. These investigations included drilling 38 soil borings throughout the Site as a means to collect soil samples and groundwater samples via temporary wells. 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 our review of subsequent Whitestone reports. The results indicated that levels of cVOCs in the western and northern portions of the property and base neutrals in the southeastern portion of the property were detected in soils and groundwater at

concentrations above Standards in place at that time (NYSDEC Technical and Administrative Guidance Memorandum [TAGM]).

3.1 2003 – 2008 INVESTIGATIONS – SITE WIDE

3.1.1 Site-Wide

In March 2003 and May 2004, Whitestone Associates, Inc. (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. Soil samples were collected from only MW-1, MW-2, MW-3, MW-7, and MW-8S. The soil boring results indicated that fill underlies the Site (which again is covered by asphalt and the Site building). Soil sample results showed that no VOCs, SVOCs, metals, pesticides, or polychlorinated biphenyls (PCBs) were detected above NYSDEC recommended Soil Cleanup Objectives (SCOs) in MW-2, MW-3, and MW-7 and no VOCs or PCBs above SCOs in MW-1 and MW-8S. Only SVOCs and metals were detected at levels above SCOs in MW-1 and MW-8S.

Groundwater sample results showed concentrations of chlorinated VOCs (cVOCs) at levels exceeding NYSDEC Groundwater Quality Standards (GWQS) at MW-2 and MW-4; cVOCs and SVOCs above GWQS in MW-4D; and benzene, ethylbenzene, toluene, xylene (i.e., BTEX) above GWQS at MW-6. In the southeastern portion of the Site, BTEX and SVOCs were reported above GWQS in MW-1 only. A dense non-aqueous phase liquid (DNAPL), 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 Site wells. The results from this event were similar to previous results (i.e., BTEX and SVOCs in MW-1, cVOCs and SVOCs at MW-4 and MW-4D, and BTEX in MW-6).

3.1.2 Southeastern Area

On May 28 and June 11, 2008, Enhanced Fluid Recovery (EFR) activities were conducted in MW-1. During these EFR events, 750 and 800 gallons were pumped from MW-1. Post-EFR groundwater samples collected on October 16, 2008 continued to show levels of BTEX and SVOCs above GWQS 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.

3.1.3 Northern Area

In June 2004, Whitestone collected sub-slab soil vapor samples for VOC analyses by Method TO-15 from four temporary probes (identified as SV-1 to SV-4) located in the former Bell Boy Cleaners unit. PCE concentrations were reported at levels ranging from 3,800 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.

In June 2008, Whitestone collected indoor air quality (IAQ) samples from the former Bell Boy 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 results 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 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 at the subject unit. This was conducted by Stantec in 2011 (see Section 4.2).

In June 2008, six soil gas vapor samples (identified as SG-1 to SG-6) were also collected from locations around the perimeter of the property. Results showed the highest concentrations of PCE at location SG-1 (210 ug/m^3), which was located in the sidewalk on the north side 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.

3.2 2012 – 2018 INVESTIGATIONS – SITE WIDE

3.2.1 Western Area – Area of Concern #1

Stantec conducted investigation work in 2012 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. Laboratory analytical results for soil are presented in Table 4 and for groundwater in Tables 5 and 5a. Spider maps depicting exceedances of SCOs and GWQS are presented on Figures 5 and 6.

As shown on Table 4, only one soil sample, 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 mg/Kg, which is below its applicable Commercial SCO of 150 mg/Kg. As shown on Figure 5, although there are no exceedances of Commercial SCOs for cVOCs, MW-103 is located approximately 20 feet southwest of the MW-4/4D well pair and in the vicinity of the 2008 HRC© injection area. All other soil samples had concentrations of VOCs reported at levels below Commercial SCOs or below laboratory detection limits.

Concentrations of SVOCs in soils were reported at levels exceeding Commercial 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 4 and Figure 5). The individual SVOCs exceeding SCOs in these five soil samples correspond to PAHs with the highest Total PAH levels occurring in MW-102 (488 mg/Kg), MW-104 (86 mg/kg), MW-105 (45 mg/kg), MW-103 (36 mg/kg), and MW-107 (13

mg/kg). SVOC concentrations in the samples collected at deeper intervals in these same five borings were reported at levels below laboratory detection limits or below Commercial SCOs. SVOCs were also report at levels below Commercial SCOs 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. Further evaluation of the specific PAHs (such as benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene) suggest the levels encountered are more indicative of background/urban fill.

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 mg/kg) in this sample exceeded its Commercial SCO of 270 mg/kg. 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.

Groundwater sample results from 2012 from the monitoring wells in this area are shown on Table 5 and Figure 6. cVOCs were reported at concentrations exceeding GWQS at four shallow wells (MW-4, MW-5, MW-104S, and MW-106S), and BTEX compounds above GWQS at five shallow wells (MW-2, MW-5, MW-6, MW-102S, and MW-105S) and two deep wells (MW-4D and MW-102D). At the remaining wells, VOCs were reported at levels below GWQS 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 GWQS in two deep wells, MW-4D and MW-102D.

Similarly, as shown in Table 5 and Figure 6, SVOCs (primarily PAHs) were detected at levels exceeding GWQS 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 MW-4, MW-6, MW-102S, and MW-105S. At these four shallow wells, concentrations of naphthalene ranged from 240 to 440 ug/L, which accounted for 60% to 80% of the total PAHs.

SVOCs at levels exceeding GWQS 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.

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 VOCs and SVOCs. The 2018 results are presented in Table 5a and on Figure 6, 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 200 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. 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. SVOCs were reported at levels below GWQS 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.

3.2.2 Southeastern Area – Area of Concern #2

From 2012 to 2015, GEI conducted 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, TAL metals and mercury, and total and free cyanide. Locations of the borings that had concentrations of contaminants above commercial SCOs are shown on Figure 5. Locations of the monitoring wells MW-108 to MW-110 are shown on Figure 6.

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 MGP impacts.

The soil quality data indicated there were no cVOCs reported above either Unrestricted or Commercial SCOs. BTEX compounds, however, were reported at concentrations exceeding Unrestricted 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 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 mg/kg at B-111 to 1,300 mg/kg 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 mg/kg at a depth interval of 1 – 3 feet bls. Total cyanide was reported at B-110 at 127 mg/kg, which exceeded its Commercial SCO of 27 mg/kg. The overall data also suggest that soils impacted by PAHs are located at relatively shallow depths (i.e., from 0 to 12 feet bls) in the vicinity of the loading dock area. 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 mg/kg. This is the area that is planned for excavation and off-site disposal by National Grid as described in Appendix A.

In terms of groundwater, the data from the southeastern portion of the Site indicate that there were no cVOCs reported above GWQS. BTEX compounds, however, were reported at

concentrations exceeding GWQS 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 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, 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 were reported below GWQS in samples collected at the B-109, MW-109S, and MW-110S locations (see Figure 6). PAHs were reported above GWQS from samples collected via discrete sampling methods at the B-105 and B-106 locations as well as from samples collected from monitoring wells MW-1 and MW-108S. 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
38 to 40 feet	22	22

Concentrations of naphthalene accounted for 71% to 100% of the total PAHs. Samples collected from MW-108S, which is screened from 20 to 5 feet bls, had Total PAHs reported at 1,650 ug/L, with naphthalene at 1,300 ug/L (79% of the total). The data indicate the highest levels of impacts are in the top 20 feet, and in the vicinity of MW-1.

3.2.3 Northern Area – Area of Concern #3

Investigation of the northern portion of the existing shopping center building identified cVOC contaminants of concern and copper and zinc. The historical VOC data suggest that soils, groundwater, and sub-slab vapors have been impacted by a release of dry cleaning solvents that were associated with a former dry cleaner that was located within one of the retail lease units. This unit was leased by the now former Bell Boy Dry Cleaner and is now leased by Sofia's Nail Salon. The open land in the north portion of the property and the existing structure can be described as paved land along Beach Channel Drive. Much of the data reported in this document references the western portion of the property, i.e. west of the existing building from the north boundary to the south boundary of the property. This area is contiguous to what would be called the northern portion of the property. The paved land north of the building is approximately 15 feet in width and approximately 130 feet in length between the existing structure that is the Bank, and Beach Channel Drive. There is also a small paved area of approximately 60 feet by 50 feet behind, or east of the Bank and Ciros Pizza. Initial soil sampling points were advanced between the years of 2000 and 2003 in this specific northern area at locations APBH 13, APBH 17, APBH 18, APBH 19, APBH 23, MW2 and MW6. The Remedial Investigation report submitted in 2003 by Whitestone Associates, Inc. reported on MW-2 as having 34,7 ppm of zinc in soil exceeding the TAGM Recommended Soil Cleanup objectives applicable at the time. No VOCs were reported in soil samples in these locations.

Groundwater sample results from temporary wells located inside the Citibank, Ciros Pizza, and Liquor Warehouse, are identified as SVP-6, SVP-11, and SVP-9, respectively, and are shown on Table 6. Locations are shown on Figure 3. Exceedances of GWQS are presented on Figure 6.

As shown on Table 6 and Figure 6, VOCs were detected in each of the three interior samples. At SVP-6 (in the Citibank), exceedances of GWQS were reported for ethylbenzene (12 ug/L) and vinyl chloride (2.2 ug/L). At SVP-11 (in Ciros Pizza), exceedances of GWQS were reported for only PCE (6.1 ug/L). At SVP-9 (in the Liquor Warehouse), exceedances of GWQS were reported for cis-1,2-Dichloroethene (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 GWQS. 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 645 ug/L at SVP-9.

Concentrations of SVOCs were reported at levels exceeding GWQS in each of the three interior samples. At SVP-6, exceedances of GWQS 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 GWQS 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, the majority of the PAH analytes were reported at levels exceeding GWQS.

4.0 INTERIM REMEDIAL MEASURES

4.1 IN-SITU INJECTION

As mentioned previously, elevated concentrations of PCE and TCE above GWQS were detected in wells MW-4 and MW-4D in samples collected by Whitestone from 2003 to 2004. The data suggested these contaminants were from chlorinated solvents from dry cleaning compounds and that an injection of Hydrogen Release Compound (HRC©) was recommended as a remedial measure. Details of this recommendation were presented in Whitestone's August 2004 Supplemental Remedial Investigation Report & Remedial Investigation/Corrective Action Workplan and subsequent correspondence in August 2007 and October 2008. NYSDEC approved the injection in a letter dated May 2008.

On June 15, 2008, the injection of HRC© was conducted in the vicinity of MW-4/MW-4D. 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. bgs (for a total of 30-lbs per point). Post-injection groundwater samples were subsequently collected 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 ppb to 460 ppb). 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.

Figures 7 and 7a are plots of PCE concentrations from 2003 to 2018 at select wells in the vicinity of the HRC injection area. Due to relatively high levels detected historically in MW-4, this well is plotted separately (Figure 7). The data for MW-4 show an increasing trend from March 2003 to August 2007/June 2008. Following the HRC injection, a significant decrease in concentrations from 1,600 ug/L (pre-injection) to 1,000 ug/L (30-day post-injection) to 460 ug/L (90-day post-injection) is shown. From October 2008 (90-day post-injection) to January 2018, the data show a continuing decreasing trend, from 460 ug/L (October 2008) to 310 ug/L (June 2012) to 5.1 ug/L (January 2018).

Figure 7a shows PCE concentrations at MW-4D decreasing from 12 ug/L in June 2004 to below reporting limits in August 2007 and June 2008 (just prior to the injection). The levels detected after the injection continue to remain at below reporting limits with the exception 1.2 ug/L in June 2012. Concentrations of PCE at the four other wells sampled in January 2018 (MW-5, MW-104S, MW-104D, and MW-106S) are also presented on Figure 7a. The data show decreasing trends for each of these wells over the two sampling events (June 2012 and January 2018). In January 2018, PCE was reported above its GWQS of 5 ug/L at only MW-4 (5.1 ug/L) and MW-104S (5.8 ug/L).

4.2 VAPOR INTRUSION – NORTHERN AREA

Based on the historical soil, sub-slab vapor, and indoor air quality data collected from the former Bell Boy Cleaners site, 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. 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. A detailed description of the vapor intrusion results is presented in the RIR. 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 for NYSDEC review and comment on July 2, 2013.

Based on NYSDEC comments, additional work required by NYSDEC 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 3), 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 and NYSDOH subsequently reviewed the Addendum to IRM-CCR and responded with a comment letter dated March 11, 2014. This letter accepted the IRM-CCR and recommendations, which were to conduct annual operation, maintenance, and monitoring (OM&M) inspections on the SSDS. The OM&M would include inspecting the SSDS and field testing the sub-slab soil gas probes in each store unit to evaluate vacuum conditions.

Stantec conducted annual OM&M inspections of the SSDS in March 2014 and March 2015. During the March 2014 OM&M, the two SSSG probes in the Liquor Warehouse (SVP-9 and SVP-10) were replaced due to damage caused by renovating this unit in January 2014. Sub-slab soil gas and indoor air samples were also collected in March 2014 and a detailed description of the results is presented in the RIR. The OM&M inspections conducted in 2014 and 2015 consistently showed that the SSDS was operating as intended and installed and that the system continued to create a vacuum that extended from beneath the Sofia's nail Salon to the Citibank unit (to the north) and the Liquor Warehouse (to the south).

In April 2015, GEI conducted a vapor intrusion investigation inside the grocery store in accordance with NYSDEC and NYSDOH requirements. GEI collected vapor intrusion samples from three temporary sub-slab vapor points (identified as SV-101 to SV-103) that they installed and from three indoor air locations (identified as IA-101 to IA-103). These locations are shown on Figure 8. The sample results are presented in Table 7 and showed that due to elevated levels of PCE in the sub-slab point at the IA-103/SV-103 location, mitigation would likely be necessary. 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. Unfortunately, the sub-slab soil gas point (SSGP) that GEI installed (SV-103) was removed after the initial sampling in April 2015. Therefore, re-sampling at this location required installing a permanent SSGP.

This work was conducted by Stantec in January 2018. SV-103 was reinstalled and sampled along with the collection of an indoor air sample at the same location. The 2018 results, also presented in Table 7, were similar to the 2015 data in that elevated levels of PCE (> 100,000 ug/m3) were detected in the 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 presented in the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, 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 January 2018, Stantec also conducted an annual OM&M inspection of the SSDS. During this inspection, differential pressure readings were measured at all of the sub-slab probes in the various units, including the recently installed SV-103 in the grocery store. Measurable differential pressure readings ranged from -0.0005 in-Hg at SVP-103 in the grocery store to -0.035 in-Hg at SV-102 in Sofia's Nail Salon. Two of the probes in the Sofia's Nail Salon (SV-101 and SV-104) could not be accessed due to new tile flooring that had been placed in the front customer area covering both probes. The overall data suggest that the SSDS range of influence extends to the Citibank unit to the north and to the grocery store (and SVP-103) to the south.

5.0 REMEDIAL GOALS AND OBJECTIVES

5.1 CONTEMPLATED USE OF SITE

The Site is located in the Community of Belle Harbor, Queens, NY and is zoned as a commercial and manufacturing district (M-1, C8-1, and M2-1, according to the NYC Zoning and Land Use website). It is anticipated that future use of the Site will remain commercial, which is consistent with the decades-long historical use of the Site, as well as the mixed land use of the surrounding area.

5.2 REMEDIAL GOAL AND REMEDIAL ACTION OBJECTIVES

The general remedial goal for sites in the NYS Brownfield Cleanup Program is to eliminate or mitigate significant threats to the public and the environment posed by the contaminants present at a site through the proper application of scientific and engineering principles. Accordingly, the identified sources of contamination in the western and eastern portions of the Site have been or will be eliminated or mitigated to a condition acceptable to the NYSDEC under the BCP using appropriate remedial technologies, engineering controls, and administrative/institutional controls to meet the Standards, Criteria, and Guidance (SCGs) described in Section 2.6 above.

Based on the information presented in the preceding sections, the remedial action objectives (RAOs) for the site include:

Soil and Soil Vapor

- Remove soils impacted by MGP-residual contamination (i.e., total cyanide) at the B-110 location in the eastern portion of the Site (as described in Appendix A);
- Manage and/or remove as practicable, the DNAPL at MW-1 location in the southeastern portion of the Site (as described in Appendix A);
- Prevent ingestion, inhalation, or contact with Site contaminants of concern (COCs) that exceed applicable Standards (as discussed in Section 2.5) in the western, northern, and southeastern portions of the Site, and any other impacted areas potentially identified on the Site via Engineering and/or Institutional Controls (for the southeastern portion of the Site, see Appendix A);
- Prevent potential exposure to post-remediation residual COCs via Engineering Controls and Institutional Controls, including proper operation of sub-slab depressurization system(s) and execution of a NYSDEC Environmental Easement (EE) and Site Management Plan (SMP) limiting the Site usage to Restricted Residential, Commercial or Industrial. Unrestricted and Residential Use will not be allowed (for the southeastern portion of the Site, see Appendix A).

Groundwater

- Prevent potential ingestion, inhalation, or contact with COCs that exceed GWQS in the western and southeastern portions of the Site (for the southeastern portion of the Site, see Appendix A).

- Prevent potential exposure to post-remediation residual COCs via institutional controls, including implementation of a NYSDEC Environmental Easement and Site Management Plan limiting future use of on-site groundwater to non-potable uses unless appropriate treatment of the water is utilized (for the southeastern portion of the Site, see Appendix A).

6.0 EVALUATION OF REMEDIAL ALTERNATIVES

The remedial alternatives are described in the following sections based upon the screening criteria set forth in NYSDEC's DER-10 document. This evaluation of alternatives addresses conditions as they currently exist, after the implementation of the IRMs described in Section 4.

6.1 DESCRIPTION OF POTENTIAL ALTERNATIVES: WESTERN AREA AND NORTHERN AREA

6.1.1 Potential Remedial Alternatives to address COC-Impacted Soil

As described in Section 3 above, the remedial investigation identified limited impacts to surface and subsurface soils in both interior and exterior areas that exceeded Commercial SCOs. These included levels of SVOCs in five soil samples, copper in two soil samples collected in 2003 at location MW-2-S2 and in sampling conducted in 2012 at location MW 104. . No soil samples had VOCs reported above Commercial SCOs. This section provides a generalized description of each potential alternative.

6.1.1.1 Alternative 1.1: No Action

The No Action response is considered as a remedial technology to provide a baseline effort for comparison to other technologies. No remedial actions would be taken for the soils in this area of the Site and no future monitoring or sampling would be performed. The soils would remain beneath the asphalt parking lot.

Alternative 1.1 is considered viable due to the lack of soil samples reporting exceedances of Commercial SCOs for cVOCs, only a few locations with exceedances of Commercial SCOs for PAHs (see Figure 5), and only one exceedance of Commercial SCOs for copper. Further, the specific PAHs, such as benzo (a) anthracene and benzo(a) pyrene, and levels are consistent with urban/background fill and not a spill or release. Copper was not identified in significant concentration elsewhere and is not considered a significant source issue and was not carried through the evaluation of remedial action alternatives, except that copper will be mentioned in any property deed restriction that may be placed on the property as referenced in the preceding remedial action alternatives. This alternative provides protection of human health and the environment by leaving the impacted soils in place beneath the paved parking lot thereby preventing exposure. This alternative does not include the removal of on-site soils so soils at levels exceeding Commercial SCOs would remain. The potential short-term impacts and risks of this remedy upon the community and the environment are negligible, since the primary issue of contamination and/or risk is the impacted soils located below the existing pavement. Because of its depth below the subsurface and below pavement/cap, potential exposure would be limited to construction workers actively excavating into the soils for such things as underground utility repairs. In the same way, although impacted soils will remain on site, long term effectiveness can be achieved as long as the integrity of the pavement is maintained and potential exposure to construction workers is managed through the implementation of appropriate soil handling procedures, air monitoring, and dust suppression techniques.

This alternative has the ability to reduce the toxicity of PAH-impacted soils through natural biodegradation. Over time the levels of cVOCs and SVOCs will likely decrease. This alternative is easily implemented and cost effective. This alternative would also require maintaining the usage as commercial, which would likely gain community acceptance. For these reason, no action is considered to be the preferred alternative.

6.1.1.2 Alternative 1.2: Impacted Soil Removal & Offsite Disposal (Track 1)

Alternative 1.2 consists of removing all impacted soils exhibiting concentrations in excess of Unrestricted Use SCOs (as presented in 6 NYCRR Part 375 Table 375-6.8(a)) and off-site disposal as non-hazardous waste at a permitted facility. The excavated area would be backfilled and covered or re-paved with asphalt pavement. Table 4A presents the soil quality results from 2012 along with the Unrestricted SCOs. Although not depicted on Figure 5, but presented in Table 4A, the contaminants detected in soil samples above Unrestricted Use SCOs include metals, SVOCs, and VOCs and are located throughout this entire area. It is estimated this would involve removal of approximately 4000 cy (~6000 tons) of soil.

This alternative is protective of human health and the environment since all impacted soils would be removed and disposed of off-site. This alternative has a high implementability and would result in the reduction of the toxicity, mobility, and volume of contaminants in the soil. Therefore, the removal of fill would be in compliance with the SCGs.

This alternative would increase short-term potential risks for the community and the workers implementing the alternative (i.e., through the actual disturbance of impacted soils). However, these risks would be minimized through the implementation of appropriate soil handling procedures, air monitoring, and dust suppression techniques. Furthermore, this alternative would be effective in the long-term since the soil removal and disposal would be a permanent remedy.

This alternative is likely to receive community acceptance due to its positive aspects. However, while this alternative scores high in the categories above, due to its excessively high cost, it is not considered practical or cost effective and was not considered any further.

6.1.1.3 Alternative 1.3: Source Area Impacted Soil Removal & Offsite Disposal

As described in Section 3.2.1 and shown on Tables 5 and 5A and Figure 6, cVOCs were reported at concentrations exceeding GWQS in monitoring wells located within and/or downgradient of the western portion of the original shopping center that was demolished. And as described in Section 6.1.1.2 above and Table 4A, soils with PCE in excess of Unrestricted SCOs are shown to exist in this same area.

Therefore, Alternative 1.3 consists of removing cVOC impacted soils (primarily PCE) exhibiting concentrations in excess of Unrestricted SCOs (Table 4A) and presumed to be potential sources of groundwater impacts. In this Alternative, soil excavated will be characterized for waste disposal and sent off site to the appropriate disposal or beneficial reuse facility/location depending on that waste characterization and facility approvals.. The excavated area would be backfilled and covered or re-paved with asphalt. It is estimated this would involve removal of approximately

1000 cy (1500 tons) of soil. Like Alternative 1.1, this alternative would also require maintaining the integrity of the asphalt pavement (i.e., cap or engineering control) in those areas not excavated.

Excavation and offsite disposal of suspected source area PCE impacted soil scores high as an alternative for several criteria. It is protective of human health and the environment and would provide immediate positive impact by eliminating contaminated material thereby rapidly achieving many SCGs. Similar to Alternative 1.2, short-term potential risks would increase due to actual disturbance of impacted soils and potential contact but would have long-term effectiveness due to the removal of impacted source material. This alternative would have high implementability and would likely receive community acceptance due to its positive aspects. However, although capital costs are less than removing all impacted soil, this alternative is not deemed cost effective and will not be further evaluated.

6.1.2 Potential Remedial Alternatives to Address Groundwater Impacts in the Western and Northern Areas

As described in Section 3 (Tables 5 and 5A and Figure 6), groundwater samples collected in 2012 and 2018 showed cVOCs at levels exceeding GWQS in four shallow wells and one deep well and SVOCs (primarily PAHs) at levels exceeding GWQS in eight shallow and 2 deep wells in the western portion of the Site. This section provides a generalized description of potential alternatives. Semi-Volatile Organic Compounds (SVOCS), which are the identified as PAH compounds, are detected in groundwater at low concentrations in the western portion of the property and in higher concentrations to the east and south of the existing building. The Alternatives described here will cause a beneficial reduction of concentrations of PAHs, excluding Alternative 2.1 No Action and Alternative 3, which is targeting sub-slab and indoor air concerns. PAH detections at elevated concentrations east and south of the existing building will be addressed by alternatives evaluated in Section 6.2.2 of this report.

6.1.2.1 Alternative 2.1: No Action

The No Action/Monitored Natural Attenuation response is considered as a remedial technology to provide a baseline effort for comparison to other technologies. This alternative involves no active remedial action(s). However, because cVOC and PAH groundwater impacts were identified on-site, additional groundwater quality monitoring would be included. This monitoring would be focused on determining what degree of contaminant attenuation in groundwater is occurring through natural processes, such as biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological destruction. As shown on Figures 7 and 7A, the groundwater quality data show decreasing trends in PCE concentrations over time at the various monitoring wells in this area.

Alternative 2.1 is considered viable because it protects human health and the environment and complies with SCGs. It would not involve excessive long-term monitoring costs, and it would not be a barrier to site re-development. Based on the identified contaminants and decreasing concentration trends, natural processes would likely be capable of breaking down the contaminants to levels where exposure threats were reduced to acceptable levels within a reasonable time frame, thereby reducing the toxicity of contaminated material and increasing

the long-term effectiveness. This alternative is easily implemented and cost effective and so is considered further.

6.1.2.2 Alternative 2.2: In-Situ Chemical Oxidation (ISCO) of Groundwater (Track 1)

Alternative 2.2 would consist of in-situ remediation of groundwater. This alternative would likely be performed in conjunction with the removal and disposal of all impacted soil as described in Alternative 1.2 above to form a Track 1 cleanup. The ISCO would involve injection of a chemical oxidizer throughout the area of impacted groundwater, which should result in the eventual breakdown of COCs, to include the cVOCs and PAHs over time, to harmless chemical bi-products, such as carbon dioxide and water. Follow-up groundwater monitoring would be required to document the effectiveness of the remedial action. Multiple injections of the chemical oxidizer would be expected to achieve Track 1 remedial SCGs.

Although this alternative scores high in some criteria for groundwater VOC remediation (compliance with SCGs, reduction in contaminant toxicity and volume, and long-term effectiveness), its cost indicates it is less desirable than other alternatives for groundwater. The primary drawbacks for this alternative are: 1) lower implementability due to the highly-specialized equipment and contractor requirements; 2) very high overall capital costs; 3) utilizes strong oxidizing chemicals in the process; 4) may have possible negative impacts to naturally-occurring dechlorination; and 5) may require multiple applications of the reagent. Based on these factors the Track 1 alternative is not considered practical or cost-effective and was not considered any further.

6.1.2.3 Alternative 2.4: *In-Situ* Bioremediation (Enhanced Reductive Dechlorination) of Groundwater

Alternative 2.4 consists of in-situ treatment of groundwater by enhancing naturally-occurring breakdown of halogenated VOCs by indigenous bacteria. Contaminant degradation is dependent on the presence of the appropriate nutrients and energy sources. The biochemical transformation of contaminants is the result of enzymes produced by the microorganisms that act as catalysts for the degradation reactions.

In enhanced reductive dichlorination (ERD), the chlorinated VOCs (e.g. PCE, TCE) serve as an electron acceptor (or weak oxidizing agent) that is reduced by electrochemical reactions with other chemicals in the groundwater that serve as electron donors. Therefore, an additional carbon source material is usually required for the reaction to proceed.

Specialized laboratory testing is required to confirm that a population of bacteria capable of reducing the cVOCs exists, and that groundwater conditions are favorable to warrant the provision of enhancements to the process. Bench testing also is performed to identify a donor material that will provide optimum ERD results. Follow-up groundwater quality monitoring would be required to document the effectiveness of this remedial method. Supplemental injection of the ERD material could be performed if needed to achieve remedial objectives.

This alternative would likely be combined with source-area soil removal. ERD material would then be added to the bottom of the excavation under a soil removal scenario, where the ERD material would then mix with/dissolve into groundwater, or the ERD material could be added by direct injection to groundwater, similar to what was previously conducted at the site in 2008 (see Section 4.1). This alternative scores high in most criteria for groundwater cVOC remediation. The most positive aspects include: 1) capitalizes on naturally-occurring degradation demonstrated through groundwater monitoring results showing increasing degradation products; 2) will have good long-term effectiveness/permanence; 3) fairly implementable if applied to bottom of excavation in conjunction with soil excavation, but would require installation of injection wells if direct injection to groundwater is used; 4) reduces toxicity and volume of contaminants; and 5) should have high degree of community acceptance.

Alternative 2.4 scores low due to anticipated time of remediation, costs and decreasing effectiveness without redosing. Potential negative aspects include 1) the possibility of short-term, temporary increases in levels of PCE "daughter products" during the initial reductive dechlorination phase; 2) additional application of the donor solution may be required; and 3) is relatively costly. Based on these factors, this alternative is not considered practical or cost-effective and was not considered any further.

6.1.3 Potential Remedies to Address Indoor Air Issues in the Western and Northern Areas

6.1.3.1 Alternative 3: Engineering Control - SSDS Operation

Based on the presence of cVOC contamination in both soil and groundwater in the western parking lot and beneath portions of the building and given that the retail businesses in the building will be occupied, mitigation of potential soil vapor intrusion is required and accomplished via continued operation of the sub-slab depressurization system (SSDS) in the Sofia's Nail Salon (see Section 4.1). The SSDS incorporates a system of piping connected to an electric fan that evacuates air from beneath the slab, and discharges those vapors above the building roof, thereby preventing potential buildup of cVOC vapors that might enter the occupied spaces.

This alternative provides direct mitigation of the potential for cVOC vapors to impact the interior spaces occupied by workers and customers. It counteracts the need to remove all impacted soil beneath the building and also provides protection from potential cVOC vapors from soil and groundwater and so is protective of human health and the environment and complies with SCGs. The long-term effectiveness of the system and reduction of contaminated material is monitored by an annual operation, maintenance and monitoring program. Although the capital costs were significant, this alternative scores high for most other criteria, and is an essential part of the remedial action for the Site.

6.2 DESCRIPTION OF POTENTIAL ALTERNATIVES: SOUTHEASTERN AREA

As described in Section 3.2.2 (Figures 5 and 6), soil and groundwater samples collected identified a limited area of MGP-related source material at the site in the area immediately surrounding monitoring well MW-1. The soil quality data indicated there were PAHs in soils above

SCOs in samples collected at depths ranging from 7 to 12 feet bls in the vicinity of MW-1 and the loading dock area. PAHs and cyanide were also detected above the SCOs in the shallow soils in the vicinity of borings B-110 and B-117. This is the area that is planned for excavation and off-site disposal by National Grid as described in Appendix A. Groundwater impacts above GWQS in this area are limited to BTEX and PAHs compounds at locations in the vicinity of the source material identified at MW-1.

This section provides a generalized description of potential alternatives considered for these impacts.

6.2.1 Potential Remedial Alternatives to Address MGP/Cyanide Impacted Soil

6.2.1.1 Alternative 4.1: No Action

The No Action response is considered as a remedial technology to provide a baseline effort for comparison to other technologies. No remedial actions would be taken for the MGP-related source material, Cyanide, and PAH soil impacts in this area of the Site and no future monitoring or sampling would be performed. The MGP-related source material, Cyanide, and PAH soils would remain adjacent to the foundation of the existing building and beneath the asphalt parking lot.

Alternative 4.1 is considered partially viable for the site due to the depth of the MGP-related source material and the locations of soil samples reporting exceedances of Commercial SCOs for Cyanide and PAHs (see Figure 5). This alternative would be protective of human health and the environment to the extent to which current conditions are already protective and such conditions remain in the future by leaving the impacted soils in place beneath the existing building and under paved areas thereby preventing exposure. This alternative does not include the removal of MGP-related source material and on-site soils so soils at levels exceeding Commercial SCOs would remain.

There are no potential short-term impacts and risks associated with this remedy on the community and the environment since no remedial actions would be implemented. With the exception of the shallow cyanide and PAH soil impacts in the vicinity of B-110 and B-117, the remaining MGP-related source material and PAH impacted soils are present at depths between 7 to 12 feet bls. For the deeper soils, potential exposure would be limited to future construction workers actively excavating into impacted soils for such things as significant construction at the property. However, the shallow impacts in the vicinity of B-110 and B-117 could be exposed if the pavement was damaged or cracked.

Although MGP-related source material and impacted soils will remain on site, aspects of the long term effectiveness of this alternative can be achieved to the extent to which the current conditions are already protective of human health and the environment, and such conditions remain in the future. For instance, maintaining the integrity of the existing ground cover and the shopping center building would prevent direct contact with, or ingestion of, MGP-impacted soil. Potential exposure to future construction workers would be managed through the implementation of appropriate soil handling procedures, air monitoring, and dust suppression techniques. The

existing ground surface cover across the Site also limits infiltration of precipitation into the overburden.

This alternative is implementable and cost effective. This alternative would also require maintaining the usage of the property as commercial, which would likely gain community acceptance.

This alternative will not reduce the toxicity of MGP-related source material and impacted soils through natural biodegradation. Although over time the levels of PAHs in the soils will likely decrease, the presence of the source material will continue to contribute to groundwater impacts.

Since MGP-related source material will continue to contribute to groundwater impacts and the presence of shallow impacts immediately below the pavement in the vicinity of borings B-110 and B-117 could be exposed if the pavement is damaged, the no action alternative is not recommended for further consideration for soils in this area.

6.2.1.2 Alternative 4.2: Shallow Excavation of Impacted Soils

Alternative 4.2 consists of removing shallow impacted soils exhibiting concentrations in excess of Commercial Use SCOs (as presented in 6 NYCRR Part 375 Table 375-6.8(b)) and off-site disposal as non-hazardous waste at a permitted facility. The area would excavation is described in Appendix A and consists of the soils between 1-3 feet bls in the vicinity of borings B-110 and B-117. The excavated area would be backfilled and re-paved with asphalt pavement. It is estimated this would involve removal of approximately 240 cubic yards (cy) of soil.

This alternative would be protective of human health and the environment since shallow impacted soils exhibiting concentrations in excess of Commercial Use SCOs would be removed and disposed of off-site. This alternative is readily implementable and would result in the reduction of the toxicity, mobility, and volume of contaminants in the soil. While exceedances of certain SCOs would remain in the inaccessible area of the site, such exceedances do not necessarily equate to a current risk to public or the environment. Measures to address potential exposure pathways would be implemented as part of this alternative (e.g., restricting land and groundwater use, requiring adherence to provisions to any long-term controls). Therefore, the removal of shallow impacted soils would be in compliance with the SCGs.

This alternative would increase potential short-term impacts to the community and the workers implementing the alternative (i.e., through the actual disturbance of impacted soils). However, these risks would be minimized through the implementation of appropriate soil handling procedures, air monitoring, and dust suppression techniques. Community access to the Site would be restricted during remedy implementation. Risks to the Community would also be minimized by the implementation of a Community Air Monitoring Program and the use of engineering controls.

This alternative would be effective in the long-term by removing the shallow soil impacts and maintaining a surface cover across the site. Since the remaining impacted soils would be located at depth below the asphalt pavement, potential exposure would be limited to construction

workers actively excavating into the soils for such things as underground utility repairs. As with the soil removal, these risks would be minimized through the implementation of appropriate soil handling procedures, air monitoring, and dust suppression techniques.

The shallow removal action can be readily implemented and is cost effective in lieu of the long-term maintenance of the pavement surface to prevent exposure. This alternative is likely to receive community acceptance due to its positive aspects. For these reasons, this alternative is considered the preferred remedial alternative.

6.2.1.3 Alternative 4.3: Remove All Impacted Soils (Track 1)

Alternative 4.3 consists of removing all impacted soils exhibiting concentrations in excess of Unrestricted Use SCOs (as presented in 6 NYCRR Part 375 Table 375-6.8(a)) and off-site disposal as non-hazardous waste at a permitted facility. This alternative would require additional sampling to determine if MGP-related source material and impacted soils are present beneath the building foundation adjacent to MW-1. If MGP-related source material is present beneath the building, then selective demolition of a portion of the building may be required to remove the MGP-related source material.

This alternative is protective of human health and the environment since all MGP-related source material and impacted soils would be removed and disposed of off-site. This alternative can be implemented but would be difficult if selective demolition would be required.

This alternative would result in the reduction of the toxicity, mobility, and volume of contaminants in the soil. Therefore, the removal of MGP-related source material and impacted soils would be in compliance with the SCGs.

This alternative would increase potential short-term risks for the community and the workers implementing the alternative (i.e., through the actual disturbance of impacted soils). However, these risks would be minimized through the implementation of appropriate soil handling procedures, air monitoring, and dust suppression techniques. Community access to the Site would be restricted during remedy implementation. Risks to the Community would also be minimized by the implementation of a Community Air Monitoring Program and the use of engineering controls.

This alternative would be effective in the long-term since the soil removal and disposal would be a permanent remedy.

This alternative is likely to receive community acceptance due to its positive aspects. However, while this alternative scores high, due to its excessively high cost and the potential requirement for selective demolition of the existing active supermarket structure, it is not considered practical or cost effective and is not considered any further.

6.2.2 Potential Remedial Alternatives to Address MGP-Related Impacts to Groundwater

6.2.2.1 Alternative 5.1: No Action

The No Action/Monitored Natural Attenuation response is considered as a remedial technology to provide a baseline effort for comparison to other technologies. This alternative involves no active remedial action(s). Future monitoring would be focused on determining what degree of contaminant attenuation in groundwater is occurring through natural processes, such as biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological destruction.

Alternative 5.1 may not be a viable alternative because it does not address the identified MGP-related source material. The existing asphalt pavement across the Site would limit infiltration of precipitation into the overburden, which reduces the migration of MGP-related impacts that could result in impacts to groundwater.

Existing groundwater use laws [10 NYCRR 5-1.31(b)] prohibit the installation of private wells where public water supply is available, unless approval is expressly granted by the public water supplier. These laws would continue to minimize potential human exposure to MGP-related impacts in groundwater at concentrations exceeding standards/guidance values. There is no groundwater usage at or in the immediate area of the Site and all businesses and residences at/near the Site are supplied by city water.

Based on the identified presence of MGP-related source material and related contaminants in groundwater, natural processes would likely not be capable of breaking down the contaminants to levels where exposure threats would be reduced to acceptable levels within a reasonable time frame. This alternative is not recommended for further consideration in this area.

6.2.2.2 Alternative 5.2: DNAPL Recovery

Alternative 5.2 consists of DNAPL recovery at monitoring well MW-1 to reduce the volume of MGP-related source material that has the potential to contribute to MGP-related groundwater impacts. The remedy would be implemented following the completion of the shallow soil excavation alternative. Prior to implementation of the DNAPL recovery, an evaluation and assessment of the DNAPL's mobility and hydraulic recoverability will be performed. Determination of the mobility of the DNAPL will determine the frequency of DNAPL recovery. A detailed description of the proposed DNAPL evaluation is included in Appendix A. Any DNAPL removed from the site would be tested and disposed of in accordance with all regulatory requirements at an off-site permitted facility.

This alternative would be protective of human health and the environment since MGP-related source material would be removed and disposed of off-site. This alternative is readily implementable and would result in the reduction of the toxicity, mobility, and volume of MGP-related contaminants in groundwater as the source of the MGP-related groundwater impacts would be removed. Therefore, the removal of MGP-related source material contributing to MGP-related groundwater impacts would be in compliance with the SCGs.

This alternative would have limited short-term potential risks for the community and the workers implementing the alternative (i.e., removal, handling, and disposal of DNAPL). However, these risks would be minimized through the implementation of appropriate material handling

procedures, air monitoring, and waste storage practices. Existing groundwater use laws [10 NYCRR 5-1.31(b)] prohibit the installation of private wells where public water supply is available, unless approval is expressly granted by the public water supplier. These laws would continue to minimize potential human exposure to MGP-related impacts in groundwater at concentrations exceeding standards/guidance values. There is no groundwater usage at or in the immediate area of the Site and all businesses and residences at/near the Site are supplied by city water.

This alternative would be effective in the long-term since a recovery program would decrease the volume of MGP-related source material contributing to groundwater impacts. The existing asphalt pavement across the Site would limit infiltration of precipitation into the overburden, which reduces the migration of MGP-related impacts that could result in impacts to groundwater.

The DNAPL recovery evaluation and recovery operations would be easily implemented and are cost effective when compared to direct excavation. This alternative is likely to receive community acceptance due to its positive aspects. For these reasons, this alternative is considered the preferred remedial alternative to address the source of groundwater impacts.

6.2.2.3 Alternative 5.3: Remove All Impacted Soils Contributing to MGP-related Groundwater Impacts (Track 1)

Alternative 5.3 consists of removing all impacted soils exhibiting concentrations in excess of Unrestricted Use SCOs (as presented in 6 NYCRR Part 375 Table 375-6.8(a)) and off-site disposal as non-hazardous waste at a permitted facility. This alternative would require additional sampling to determine if MGP-related source material and impacted soils are present beneath the building slab adjacent to MW-1. If MGP-related source material is present beneath the building, then selective demolition of a portion of the building may be required to remove the MGP-related source material.

This alternative is protective of human health and the environment since all MGP-related source material and impacted soils that have the potential to contribute to MGP-related groundwater impacts would be removed and disposed of off-site.

This alternative would result in the reduction of the toxicity, mobility, and volume of MGP-related contaminants in groundwater as the source of the MGP-related groundwater impacts would be removed. Therefore, the removal of MGP-related source material and impacted soils contributing to MGP-related groundwater impacts would be in compliance with the SCGs.

This alternative would increase short-term potential risks for the community and the workers implementing the alternative (i.e., through the actual disturbance of impacted soils). However, these risks would be minimized through the implementation of appropriate soil handling procedures, air monitoring, and dust suppression techniques. Furthermore, this alternative would be effective in the long-term since the soil removal and disposal would be a permanent remedy that removes the source of MGP-related groundwater impacts.

This alternative is likely to receive community acceptance due to its positive aspects. However, while this alternative scores high, due to its excessively high cost and the potential requirement for

selective demolition of the existing active supermarket structure, it is not considered practical or cost effective and is not considered any further.

7.0 REMEDIAL ACTION WORK PLAN

Impacted media (i.e., soil, groundwater, and soil vapor) were identified at this Site during remedial investigations conducted from 2000 to 2018 at levels that warranted remedial action. As described in Section 4, interim remedial measures were conducted that included an injection of HRC in 2008 in the vicinity of the demolished western portion of the original shopping center to remediate groundwater, and removal of impacted sub-slab soil and installation of a sub-slab depressurization system in the Sofia's Nail Salon retail unit in 2011 to remediate sub-slab soil and vapors.

Remedial investigation work conducted since the IRMs were implemented has further defined the extent of impacted media, concentrations of COCs, and the Site hydrogeologic conditions. Based on these data, the following remedial actions will be undertaken.

7.1 WESTERN AREA - SOILS IMPACTED WITH PAHs

Alternative 1.1 is recommended and will be implemented by maintaining a cap over the entire Site exterior, including remaining impacted areas, as an engineering control. This cap will include asphalt parking lot and a concrete floor in the buildings.

7.2 WESTERN AND NORTHERN AREAS – GROUNDWATER IMPACTED WITH CVOCS AND PAHS

Alternative 2.1 is recommended. As discussed above, groundwater monitoring results to date in the western area of the Site indicate improvement in the quality of the source area wells (MW-4/MW-4D) when compared to pre-IRM (2008 HRC injection) contaminant levels. The decreasing trend in PCE concentrations along with the increasing trends in breakdown products (cis-1,2-DCE and VC) indicate that natural attenuation is occurring. Levels of PAHs also indicate decreasing trends. Stantec will implement alternative 2.1 and conduct two additional sampling events during high- and low-water table periods (i.e., spring and fall) to further evaluate trends. After the fall event, the results will be reviewed with NYSDEC to assess the need for further monitoring or other actions should further enhancement of the natural bioremediation effort be necessary.

7.3 SOUTHEAST AREA - SOILS IMPACTED WITH MGP-RESIDUALS AT B-110 LOCATION

As mentioned previously, investigation and remediation in the southeastern area/ rear parking lot area is being conducted by National Grid under an agreement with Ahold. The Work Plan for this portion of the remedy is attached as Appendix A.

7.4 SOUTHEAST AREA - DNAPL RECOVERY FROM MW-1

This is also an area that will be addressed by National Grid during their work at the Site in accordance with the plan provided in Appendix A.

7.5 WESTERN AND NORTHERN AREAS - ENGINEERING CONTROLS TO ADDRESS INDOOR AIR ISSUES

7.5.1 Communication/Pilot Test

As mentioned previously, the indoor air sample results from the SV-103/IA-103 location in the grocery store indicate that indoor air is not an issue. However, the concentrations of COCs in the sub-slab soil vapors indicate that mitigation is necessary to further reduce the potential of indoor air concerns. To address the potential for vapor intrusion at the SV-103/IA-103 location in the grocery store, Stantec will conduct a communication test on the existing SSDS in the Sofia's Nail Salon unit as well as on SV-103 itself. The testing will be conducted by temporarily replacing the existing SSDS fan with a larger fan to induce a greater vacuum under the building slab. Differential pressure measurements will be made using a digital manometer at the sub-slab soil gas probes in the various lease units. The test fan, or similar vacuum-inducing equipment, will also be plumbed/attached to SV-103 to induce a vacuum at this location while collecting pressure differential readings at nearby soil gas probes. Sub-slab vapors extracted during the tests will be exhausted through a vent hose to the building exterior.

Currently, the data suggest that there is existing communication from the vacuum being pulled by the SSDS system in the Sofia Nails unit extending as far as the northern portion of the grocery store sub-slab area. The pilot test will provide better confirmation of the capture range of the existing system under normal operating conditions. Additionally, the pilot test data will allow evaluation of remedial scenarios for the potential upgrade of the existing system, should a larger capture zone be needed, or suggest that a separate SSDS system is warranted. The resulting remedial scenario from evaluating the pilot test data will be designed and implemented following regulatory approval.

7.6 INSTITUTIONAL CONTROLS

7.6.1 Site Management Plan (SMP)

Following completion of the proposed remedial actions described herein, some residual contamination may remain in soil and groundwater. In order to minimize the potential for future intrusive Site activities to increase the spread of contamination or create potential exposures to impacted soil, groundwater, or sub-slab vapors, an SMP will be developed. The SMP will document subsurface conditions across the Site, and provide guidance for:

- Continuing the ongoing groundwater monitoring program to determine when the goals of the remedial actions are met;
- Planning and executing future Site activities, such as excavation, grading, drilling, construction of new or renovation of existing buildings or utilities, etc. that could encounter impacted soil or groundwater;
- Monitoring and screening soils and groundwater for potential COCs;

- Handling, characterizing, and disposing of impacted media, if encountered;
- Operating and maintaining the engineering and institutional controls that are currently in place or planned at the Site; and
- Ongoing Site inspection, monitoring and reporting requirements.

The SMP will be submitted to NYSDEC for review/approval.

7.6.2 Environmental Easement

The outcome of the remedial actions will include an evaluation of conditions for groundwater, soil, and vapor intrusion to understand whether or not an environmental restriction is necessary. In the event that an Environmental Easement is necessary, this final outcome for the remedial actions would potentially include restricting use of the Site to commercial or industrial uses and would include a restriction preventing use of groundwater underlying the Site without treatment rendering it safe for the intended use. The Environmental Easement would include and incorporate the SMP by reference

The Easement would be filed with the Queens County Clerk's office.

LIMITATIONS

1. The conclusions presented in this report are based on soil, groundwater, and air data collected from widely-spaced explorations targeting areas of suspected contamination based on Stantec's site reconnaissance and review of available information.

2. Soil, groundwater, and air samples were analyzed for suspected parameters based on available information indicating the types of operations that have been performed and the suspected types of chemicals used and stored at the Site. Other operations or uses may have occurred at the Site that were not identified in our review of available information or were not communicated during interviews with knowledgeable individuals at the site.

3. Soil contaminant concentrations may fluctuate due to subsurface heterogeneities, variations in moisture content, biodegradation, natural attenuation, seasonal variations, and other factors.

4. Sampling methods employed were selected to meet the objectives of identifying the potential presence of subsurface contamination and are consistent with standard industry practice.

5. No environmental site assessment can wholly eliminate uncertainty regarding the existence of contamination in connection with a property. This study was designed to reduce, but not wholly eliminate, uncertainty regarding the existence of such conditions in a manner that recognizes reasonable limits of time and cost. Based on the scope of work, Stantec cannot warrant subsurface conditions in areas not tested.

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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)	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	17	2	17	-	2	-8.15	-	6.85
MW-2	WT	3/12/2003	8.46	8.20	17	2	17	-	2	-8.54	-	6.46
MW-2D	DOB	5/25/2004	8.44	8.21	40	2	40	-	35	-31.56	-	-26.56
MW-3	WT	3/13/2003	8.95	8.57	17	2	16	-	2	-7.05	-	6.95
MW-4	WT	3/13/2003	8.85	8.60	16	2	16	-	2	-7.15	-	6.85
MW-4D	DOB	5/25/2004	8.88	8.55	40	2	40	-	35	-31.12	-	-26.12
MW-5	WT	3/14/2003	8.76	8.38	16	2	16	-	2	-7.24	-	6.76
MW-6	WT	3/14/2003	8.51	8.18	16	2	16	-	2	-7.49	-	6.51
MW-7	WT	5/24/2004	8.90	8.45	18	2	18	-	3	-9.10	-	5.90
MW-8S	WT	5/24/2004	8.82	8.49	17	2	17	-	2	-8.18	-	6.82
MW-8D	DOB	5/24/2004	8.90	8.57	40	2	40	-	35	-31.10	-	-26.10
MW-101S	WT	5/10/2012	9.12	8.65	10	2	10	-	5	-0.88	-	4.12
MW-101D	MLOB	5/10/2012	9.04	8.66	30	2	28	-	23	-18.96	-	-13.96
MW-102S	WT	5/9/2012	9.63	9.27	12	2	10	-	5	-0.37	-	4.63
MW-102D	MLOB	5/9/2012	9.57	9.26	24	2	22	-	17	-12.43	-	-7.43
MW-103	MLOB	5/11/2012	9.01	8.47	28	2	26	-	21	-16.99	-	-11.99
MW-104S	WT	5/8/2012	9.06	8.51	14	2	12	-	7	-2.94	-	2.06
MW-104A -S	MLOB	5/9/2012	9.09	8.69	24	2	22	-	17	-12.91	-	-7.91
MW-104D	DOB	6/20/2012	9.19	8.93	40	2	38	-	33	-28.81	-	-23.81
MW-105S	MLOB	5/11/2012	8.80	8.54	24	2	22	-	12	-13.20	-	-3.20
MW-106S	MLOB	5/11/2012	9.61	9.13	20	2	18	-	8	-8.39	-	1.61
MW-107	MLOB	5/10/2012	9.47	9.01	28	2	25	-	20	-15.53	-	-10.53
MW-108S	WT	10/24/2012	8.52	8.36	20	2	20	-	5	-11.48	-	3.52
MW-109S	WT	10/24/2012	9.81	9.61	15	2	15	-	5	-5.19	-	4.81
MW-110S	WT	10/24/2012	8.3	8.04	20	2	20	-	5	-11.70	-	3.30

Notes:

ft MSL = Feet ablove Mean Sea Level

ft bls = feet below land surface

WT = Water Table

MLOB = Mid-Level Overburden

DOB = Deep Overburden

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.

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)		Top (ft bls)	Depth to Water * (ft bls)	Water Level Elev. (ft MSL)
MW-1	WT	3/12/2003	8.85	8.45	-8.15	-	6.85	5.32	3.13
MW-2	WT	3/12/2003	8.46	8.20	-8.54	-	6.46	5.85	2.35
MW-2D	DOB	5/25/2004	8.44	8.21	-31.56	-	-26.56	6.58	1.63
MW-3	WT	3/13/2003	8.95	8.57	-7.05	-	6.95	5.13	3.44
MW-4	WT	3/13/2003	8.85	8.60	-7.15	-	6.85	5.60	3.00
MW-4D	DOB	5/25/2004	8.88	8.55	-31.12	-	-26.12	6.08	2.47
MW-5	WT	3/14/2003	8.76	8.38	-7.24	-	6.76	5.55	2.83
MW-6	WT	3/14/2003	8.51	8.18	-7.49	-	6.51	5.35	2.83
MW-7	WT	5/24/2004	8.90	8.45	-9.10	-	5.90	5.51	2.94
MW-8S	WT	5/24/2004	8.82	8.49	-8.18	-	6.82	6.07	2.42
MW-8D	DOB	5/24/2004	8.90	8.57	-31.10	-	-26.10	NM	NM
MW-101S	WT	5/10/2012	9.12	8.65	-0.88	-	4.12	5.09	3.56
MW-101D	MLOB	5/10/2012	9.04	8.66	-18.96	-	-13.96	6.58	2.08
MW-102S	WT	5/9/2012	9.63	9.27	-0.37	-	4.63	5.83	3.44
MW-102D	MLOB	5/9/2012	9.57	9.26	-12.43	-	-7.43	6.45	2.81
MW-103	MLOB	5/11/2012	9.01	8.47	-16.99	-	-11.99	6.93	1.54
MW-104S	WT	5/8/2012	9.06	8.51	-2.94	-	2.06	5.33	3.18
MW-104A -S	MLOB	5/9/2012	9.09	8.69	-12.91	-	-7.91	5.62	3.07
MW-104D	DOB	6/20/2012	9.19	8.93	-28.81	-	-23.81	5.70	3.23
MW-105S	MLOB	5/11/2012	8.80	8.54	-13.20	-	-3.20	6.23	2.31
MW-106S	MLOB	5/11/2012	9.61	9.13	-8.39	-	1.61	6.37	2.76
MW-107	MLOB	5/10/2012	9.47	9.01	-15.53	-	-10.53	5.60	3.41
MW-108S	WT	10/24/2012	8.52	8.36	-11.48	-	3.52	NI	NI
MW-109S	WT	10/24/2012	9.81	9.61	-5.19	-	4.81	NI	NI
MW-110S	WT	10/24/2012	8.3	8.04	-11.70	-	3.30	NI	NI

Notes:

ft MSL = Feet ablove Mean Sea Level

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.

* = Water levels measured on June 26, 2012

WT = Water Table

MLOB = Mid-Level Overburden

DOB = Deep Overburden

NI = Not Installed at time of well gauging.

NM = Not Measured, not accessible

Table 4
Summary of Soil Analytical Results: 2012
Belle Harbor Shopping Center, Belle Harbor, New York

Analyte/Method[1]	units[2]	NYSDEC Commercial Soil Cleanup Objectives [3]	MW-101	MW-101	MW-102	MW-102	MW-103	MW-103	MW-104	MW-104
Sample Depth	feet		(5.0 - 6.0)	(27.6 - 28.6)	(6.6 - 7.2)	(22 - 23)	(5.2 - 6.2)	(25 - 26)	(6.3 - 6.9)	(37 - 38)
Laboratory ID			460-40154-5	460-40154-6	460-40154-3	460-40154-4	460-40261-1	460-40261-2	460-40154-1	460-40154-2
Sample Collection Date			05/10/12	05/10/12	05/09/12	05/09/12	05/11/12	05/11/12	05/08/12	05/08/12
Volatile Organic Compounds (VOCs) by EPA Method 8260B										
2-Butanone (MEK)	mg/Kg	500	0.00060 U	0.00070 U	0.00064 U	0.00069 U	0.220 U	0.00070 U	0.0038 J	0.00073 U
Benzene	mg/Kg	44	0.00077 J	0.00017 U	0.00015 U	0.00016 U	0.014 J	0.00017 U	0.002	0.00017 U
Carbon disulfide	mg/Kg	NS	0.00055 J	0.0016	0.00015 U	0.0012	0.012 U	0.00028 J	0.00064 J	0.00017 U
Chloroform	mg/Kg	350	0.00023 U	0.00027 U	0.00024 U	0.00026 U	0.0074 U	0.00027 U	0.00029 U	0.00028 U
Cis-1,2-Dichloroethene	mg/Kg	500	0.00011 U	0.00012 U	0.00011 U	0.00012 U	0.049 U J	0.00012 U	0.0056	0.00013 U
Ethylbenzene	mg/Kg	390	0.00016 U	0.00019 U	0.00017 U	0.0011	0.0090 U	0.000019 U	0.00032 J	0.00020 U
Isopropylbenzene	mg/Kg	NS	0.00011 U	0.00012 U	0.00011 U	0.00017 J	0.0072 U	0.00012 U	0.00013 U	0.00013 U
Methylene Chloride	mg/Kg	500	0.0066 B	0.014 B	0.0027 B	0.0063 B	0.017 U	0.011	0.0057 B	0.0048 B
MTBE	mg/Kg	500	0.00011 U	0.00012 U	0.00011 U	0.00022 J	0.013 U	0.00012 U	0.00013 U	0.00038 J
Styrene	mg/Kg	NS	0.00027 U	0.00031 U	0.0011	0.00031 U	0.014 J	0.00031 U	0.0012	0.00033 U
Tetrachloroethene (PCE)	mg/Kg	150	0.00094 J	0.00013 U	0.0019	0.00013 U	16.00	0.00013 U	0.120	0.00014 U
Toluene	mg/Kg	500	0.0013	0.00044 J	0.00035 J	0.00033 J	0.026 J	0.00047 U	0.0028	0.00026 J
Total Xylenes	mg/Kg	500	0.00064 U	0.00074 U	0.00068 U	0.0017 J	0.034 U	0.00074 U	0.0016 J	0.00078 U
Trans-1,2-Dichloroethene	mg/Kg	500	0.00012 U	0.00014 U	0.00013 U	0.00014 U	0.012 U	0.00014 U	0.0013	0.00015 U
Trichloroethene (TCE)	mg/Kg	200	0.00011 U	0.00013 U	0.00012 U	0.00013 U	0.034 J	0.00013 U	0.0055	0.00014 U
TOTAL VOCS			0.0102	0.0160	0.0061	0.0110	16.088	0.0113	0.1505	0.0054
Semi Volatile Organic Compounds (SVOCs) by EPA Method 8270C										
2-Methylnaphthalene	mg/Kg	NS	0.047 U	0.052 U	1.2 J	0.053 U	0.140 J	0.052 U	0.47 J	0.050 U
Acenaphthene	mg/kg	500	0.054 U	0.059 U	1.1 U	0.060 U	0.110 J	0.059 U	0.28 J	0.056 U
Acenaphthylene	mg/Kg	500	0.170 J	0.048 U	8.4	0.049 U	0.950	0.048 U	2.1	0.046 U
Anthracene	mg/kg	500	0.074 J	0.049 U	5.7 J	0.050 U	1.4	0.049 U	2.6	0.047 U
Benzo(a)anthracene	mg/kg	5.6	0.710	0.0028 U	**53**	0.0029 U	3.3	0.0028 U	**6.4**	0.0027 U
Benzo(a)pyrene	mg/kg	1	0.620	0.0029 U	**40**	0.0029 U	**3.1**	0.0029 U	**6.0**	0.0027 U
Benzo(b)fluoranthene	mg/kg	5.6	0.580	0.0026 U	**34**	0.0026 U	3.1	0.0026 U	5.6	0.0024 U
Benzo(g,h,i)perylene	mg/kg	500	0.550	0.030 U	25	0.030 U	2.2	0.030 U	4.6	0.029 U
Benzo(k)fluoranthene	mg/kg	56	0.260	0.0031 U	14	0.0031 U	0.990	0.0031 U	2.0	0.0029 U
Bis(2-ethylhexyl) phthalate	mg/kg	NS	0.120 U	0.140 U	2.4 U	0.140 U	0.120 U	0.130 U	2.9	0.130 U
Butyl benzyl phthalate	mg/kg	NS	0.034 U	0.037 U	0.67 U	0.038 U	0.032 U	0.037 U	3.7	0.035 U
Carbazol	mg/kg	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
Chrysene	mg/kg	56	0.860	0.047 U	55	0.048 U	4.0	0.047 U	7.4	0.045 U
Dibenz(a,h)anthracene	mg/kg	0.56	0.120	0.0051 U	**7.2**	0.0052 U	0.550	0.0051 U	**1.3**	0.0049 U
Dibenzofuran	mg/Kg	350	0.043 U	0.048 U	0.86 U	0.048 U	0.0041 U	0.048 U	0.0094 U	0.045 U
Diphenyl	mg/kg	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
Flourene	mg/kg	500	0.047 U	0.052 U	1.8 J	0.053 U	0.570	0.052 U	1.7	0.049 U
Fluoranthene	mg/kg	500	0.510	0.054 U	66	0.055 U	4.6	0.054 U	7.9	0.042 U
Indeno(1,2,3-cd)pyrene	mg/kg	5.6	0.450	0.0075 U	**23**	0.0076 U	2.0	0.0075 U	4.1	0.0072 U
Naphthalene	mg/kg	500	0.043 U	0.047 U	0.85 U	0.048 U	0.100 J	0.047 U	0.19 J	0.045 U
Phenanthrene	mg/kg	500	0.160 J	0.052 U	14	0.052 U	3.2	0.052 U	9.5	0.049 U
Pyrene	mg/kg	500	1.3	0.040 J	140	0.034 U	5.9	0.034 U	17	0.032 U
TOTAL SVOCS			6.4	0.040	488.3	0.000	36.21	0.00	86.00	0.0
Total Metals by EPA Method 6010B										
Aluminum	mg/Kg	NS	1,200 J	374 J	455 J	208 J	1,940	577	4,730 J	177 J
Antimony	mg/kg	NS	1.3 U	1.5 U	1.2 U	1.4 U	1.2 J	1.4 J	3.2	1.4 U
Arsenic	mg/kg	16	1.1	1.1 U	1.8	1.1 U	1.7	1.0 U	5.6	1.1 U
Barium	mg/kg	400	12.6 J	1.8 J	1.9 J	3.3 J	59.9	2.6 J	168	1.3 U
Beryllium	mg/kg	590	0.15 U	0.17 U	0.14 U	0.16 U	0.69	0.16 U	1.7	0.17 U
Cadmium	mg/kg	9.3	0.16 U	0.17 U	0.15 U	0.17 U	0.14 U	0.16 U	0.23 J	0.17 U
Calcium	mg/kg	NS	12,400	354 J	6,790	31,000	19,400 J	694 J	19,500	777 J
Chromium	mg/kg	1,500	3.3	2.3 J	5.5	0.96 U	24.1	2.9	75	0.99 U
Cobalt	mg/kg	NS	1.0 J	1.0 U	0.85 U	0.95 U	21.5	0.93 U	59	0.98 U
Copper	mg/kg	270	8.4	2.3 U	5.0	2.2 U	247	2.1 U	**783**	2.2 U
Iron	mg/kg	NS	2,930	892	5,840	491	12,600	1,230	34,500	448
Lead	mg/kg	1,000	16.9	1.4	1.5	0.96 U	211	1.7	611	0.99 U
Magnesium	mg/kg	NS	1,550	192 J	128 J	129 J	2,530	305 J	2,870	82.8 U
Manganese	mg/kg	10,000	37.9	12.3	6.9	5.7	121	16.1	396	4.3
Nickel	mg/kg	310	3.9 J	1.0 U	1.0 J	0.98 U	36.5	0.96 U	113	1.0 U
Potassium	mg/kg	NS	175 J	126 U	106 U	120 U	238 J	166 J	592 J	123 U
Silver	mg/kg	1,500	0.21 U	0.24 U	0.20 U	0.22 U	0.19 U	0.22 U	0.29 J	0.23 U
Sodium	mg/kg	NS	183 J	187 U	157 U	341 J	286 J	172 U	447 J	182 U
Vanadium	mg/kg	NS	6.5 J	2.0 J	5.9 J	1.2 J	7.6 J	2.6 J	12.5	0.88 U
Zinc	mg/kg	10,000	30.9	2.2 J	7.5	1.4 J	2,640 J	4.5 J	7,930	1.2 U
Mercury	mg/kg	2.8	0.023 U	0.025 U	0.024 U	0.025 U	0.072	0.026 U	0.091	0.025 U
TOTAL METALS			18560.5	1834.0	13,250	32,181	40,366	3,004	72,798	1,406

Notes:
[1] Only detected compounds listed - all others below respective laboratory detection limits are marked with U
[2] mg/Kg = miligrams per kilogram = parts per million (ppm)
[3] Commercial Soil Cleanup Objectives from 6 NYCCR Table 375-6.8(b).

NS= No standards in table 375-6.8(b) or the supplemental table 1
Bold = concentration exceeds Commercial Soil Cleanup Objectives

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

Table 4
Summary of Soil Analytical Results: 2012
Belle Harbor Shopping Center, Belle Harbor, New York

Analyte/Method[1]	units[2]	NYSDEC Commercial Soil Cleanup Objectives [3]	MW-105	MW-105 **	MW-106	MW-106	MW-107	MW-107
Sample Depth	feet		(5.0 - 5.8)	(21- 22)	(6.0 - 7.0)	(16.0 - 17.0)	(6.0 - 6.9)	(25.0 - 26.0)
Laboratory ID			460-40154-11	460-40154-12	460-40154-9	460-40154-10	460-40154-7	460-40154-8
Sample Collection Date			05/11/12	05/11/12	05/11/12	05/11/12	05/10/12	05/10/12
Volatile Organic Compounds (VOCs) by EPA Method 8260B								
2-Butanone (MEK)	mg/Kg	500	0.00065 U	0.00067 J	0.00064 U	0.00072 U	0.0017 J	0.0012 J
Benzene	mg/Kg	44	0.00064 J	0.00016 J	0.0017	0.00017 U	0.00018 J	0.00017 U
Carbon disulfide	mg/Kg	NS	0.00032 J	0.0025 J	0.0018	0.0035	0.00022 J	0.0025
Chloroform	mg/Kg	350	0.00025 U	0.00026 J	0.00025 U	0.00028 U	0.00024 U	0.00028 U
Cis-1,2-Dichloroethene	mg/Kg	500	0.00011 U	0.00012 J	0.00011 U	0.00013 U	0.00011 U	0.00013 U
Ethylbenzene	mg/Kg	390	0.00018 U	0.00018 J	0.00052 J	0.056	0.00017 U	0.00020 U
Isopropylbenzene	mg/Kg	NS	0.00011 U	0.00012 J	0.00011 U	0.0032	0.00011 U	0.00013 U
Methylene Chloride	mg/Kg	500	0.0016 U	0.0011 J	0.0047 B	0.013 B	0.0058 B	0.0044 B
MTBE	mg/Kg	500	0.00011 U	0.00012 J	0.00011 U	0.00013 U	0.00011 U	0.00013 U
Styrene	mg/Kg	NS	0.00029 J	0.00030 J	0.021	0.00032 U	0.00099 J	0.00033 U
Tetrachloroethene (PCE)	mg/Kg	150	0.00084 J	0.00013 J	0.032	0.00014 U	0.0019	0.00014 U
Toluene	mg/Kg	500	0.00094 J	0.00015 J	0.0025	0.0021	0.00071 J	0.00022 J
Total Xylenes	mg/Kg	500	0.00070 U	0.00072 J	0.0020 J	0.025	0.00068 U	0.00078 U
Trans-1,2-Dichloroethene	mg/Kg	500	0.00013 U	0.00014 J	0.00013 U	0.00015 U	0.00013 U	0.00015 U
Trichloroethene (TCE)	mg/Kg	200	0.00012 U	0.00013 J	0.0015	0.00014 U	0.00012 U	0.00014 U
TOTAL VOCS			0.0030	0.0068	0.0677	0.1028	0.0115	0.0083
Semi Volatile Organic Compounds (SVOCs) by EPA Method 8270C								
2-Methylnaphthalene	mg/Kg	NS	0.820	0.052 U	0.044 U	0.052 U	0.0051 U	0.053 U
Acenaphthene	mg/kg	500	0.100 U	0.059 U	0.050 U	0.059 U	0.058 U	0.061 U
Acenaphthylene	mg/Kg	500	1.20	0.048 U	0.130 J	0.048 U	0.270 J	0.049 U
Anthracene	mg/kg	500	1.10	0.049 U	0.042 U	0.049 U	0.060 J	0.051 U
Benzo(a)anthracene	mg/kg	5.6	3.80	0.0028 U	0.290	0.0028 U	1.50	0.0029 U
Benzo(a)pyrene	mg/kg	1	**3.20**	0.0029 U	0.037	0.0029 U	**1.40**	0.0029 U
Benzo(b)fluoranthene	mg/kg	5.6	3.10	0.0026 U	0.230	0.0026 U	1.40	0.0026 U
Benzo(g,h,i)perylene	mg/kg	500	2.10	0.030 U	0.110 J	0.030 U	0.85	0.031 U
Benzo(k)fluoranthene	mg/kg	56	1.00	0.0031 U	0.085	0.0031 U	0.38	0.0032 U
Bis(2-ethylhexyl) phthalate	mg/kg	NS	0.240 U	0.130 U	0.110 U	0.140 U	0.130 U	0.140 U
Butyl benzyl phthalate	mg/kg	NS	0.066	0.037 U	0.031 U	0.037 U	0.036 U	0.038 U
Carbazol	mg/kg	NS	0.085 U	0.048 U	0.041 U	0.048 U	0.047 U	0.049 U
Chrysene	mg/kg	56	4.60	0.047 U	0.440	0.047 U	1.70	0.049 U
Dibenz(a,h)anthracene	mg/kg	0.56	**0.620**	0.0051 U	0.0043 U	0.0051 U	0.24	0.0052 U
Dibenzofuran	mg/Kg	350	0.089 J	0.048 U	0.040 U	0.048 U	0.046 U	0.049 U
Diphenyl	mg/kg	NS	0.120 J	0.054 U	0.046 U	0.054 U	0.053 U	0.056 U
Flourene	mg/kg	500	0.850	0.052 U	0.091 J	0.052 U	0.051 U	0.053 U
Fluoranthene	mg/kg	500	4.00	0.054 U	0.560	0.054 U	1.10	0.055 U
Indeno(1,2,3-cd)pyrene	mg/kg	5.6	2.00	0.0075 U	0.110	0.0076 U	0.78	0.0077 U
Naphthalene	mg/kg	500	0.370 J	0.047 U	0.097 J	0.047 U	0.046 U	0.048 U
Phenanthrene	mg/kg	500	6.20	0.052 U	1.70	0.052 U	0.050 U	0.059 J
Pyrene	mg/kg	500	10.00	0.034 U	1.10	0.054 J	3.40	0.035 U
TOTAL SVOCS			45.24	0.00	4.98	0.054	13.1	0.059
Total Metals by EPA Method 6010B								
Aluminum	mg/Kg	NS	2,500 J	630 J	78.2 J	669 J	437 J	466 J
Antimony	mg/kg	NS	1.2 U	1.4 U	1.2 U	1.4 U	1.5 U	1.4 U
Arsenic	mg/kg	16	3.3	1.0 U	0.94 U	1.1 U	1.8	1.1 U
Barium	mg/kg	400	62.6	2.8 J	4.9 J	2.8 J	3.1 J	1.9 J
Beryllium	mg/kg	590	3.3	0.16 U	0.14 U	0.17 U	0.17 U	0.17 U
Cadmium	mg/kg	9.3	0.18 J	0.16 U	0.15 U	0.17 U	0.17 U	0.17 U
Calcium	mg/kg	NS	16,400	1,050 J	1,340	882 J	2,480	511 J
Chromium	mg/kg	1,500	16.7	2.7	1.5 J	3.0	6.8	2.4
Cobalt	mg/kg	NS	12.9	0.93 U	0.85 U	**0.99 U**	**1.0 U**	0.99 U
Copper	mg/kg	270	187	2.1 U	1.9 U	2.3 U	7.0	2.3 U
Iron	mg/kg	NS	10,300	1,340	3,110	1,500	10,200	1,020
Lead	mg/kg	1,000	203	1.3	12.0	1.7	8.9	1.0 U
Magnesium	mg/kg	NS	3940	354 J	71.9 U	344 J	172 J	235 J
Manganese	mg/kg	10,000	145	15.4	3.8	16.9	9.1	12.1
Nickel	mg/kg	310	32.2	0.96 U	0.88 U	1.0 U	1.1 J	1.0 U
Potassium	mg/kg	NS	285 J	194 J	143 J	182 J	126 U	132 J
Silver	mg/kg	1,500	0.19 U	0.22 U	0.20 U	0.23 U	0.24 U	0.23 U
Sodium	mg/kg	NS	312 J	173 U	158 U	184 U	186 U	184 U
Vanadium	mg/kg	NS	14.7	2.6 U J	2.7 J	2.8 J	6.5 J	2.1 J
Zinc	mg/kg	10,000	1,930	3.6 J	1.2 J	3.8 J	8.8	2.8 J
Mercury	mg/kg	2.8	0.023 U	0.025 U	0.033	0.027 U	0.024 U	0.028 U
TOTAL METALS			36348	3594	4697	3608.0	13342	2385

Notes:
[1] Only detected compounds listed - all others below respective laboratory detection limits are marked v
[2] mg/Kg = miligrams per kilogram = parts per million (ppm)
[3] Commercial Soil Cleanup Objectives from 6 NYCCR Table 375-6.8(b).

* Supplemental Soil Cleanup Objectives from CP-51/Soil Cleanup Guidance Table 1.
Bold = concentration exceeds Soil Cleanup Objectives
Bold = concentration exceeds Supplemental Soil Cleanup Objectives

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

Table 5
Summary of Groundwater Quality - Exterior: 2012
Belle Harbor Shopping Center, Belle Harbor, New York

	Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
	Laboratory ID		460-41884-7	460-41884-6	460-41785-6	460-41879-3	460-41879-4	460-41884-5	460-41785-5	460-41884-2	460-42023-3		
	Sample ID	MW-1	**MW-2**	**MW-2D**	**MW-3**	**MW-4**	**MW-4D**	**MW-5**	**MW-6**	**MW-7**	**MW-8S**	**MW-8D**	
	Sample Date		06/28/12	06/28/12	06/26/12	06/29/12	06/29/12	06/27/12	06/26/12	06/27/12	06/29/12		
	Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
VOCs (Method 8260B) Analyte	Groundwater Quality Std (ug/L)	Not Sampled										Not Sampled	
4-Methyl-2-pentanone (MIBK)	NS		0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U		
Acetone	50.00		2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U		
Benzene	1		0.080 U	0.080 U	0.080 U	0.099 J	0.080 U	0.18 J	0.76 J	0.080 U	0.080 U		
Carbon disulfide	60		0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U		
Chloroform	7		0.080 U	0.080 U	0.080 U	0.40 J	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U		
cis-1,2-Dichloroethene	5		2.5	0.18 U	0.18 U	**220**	0.23 J	0.58 J	0.18 U	0.18 U	0.18 U		
1,1-Dichloroethene	5		0.090 U	0.090 U	0.090 U	0.33 J	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U		
Ethylbenzene	5		**6.7**	0.10 U	0.10 U	0.56 J	**300**	**28**	**180**	0.10 U	0.10 U		
Isopropylbenzene	5		4.9	0.080 U	0.080 U	1.0	**5.4**	3.8	**33**	0.080 U	0.080 U		
Methylene chloride	5		0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U		
MTBE	NS		0.14 U	1.4	0.14 U	0.14 U	0.14 U	0.14 U	0.73 J	0.14 U	0.14 U		
Styrene	5		0.12 U	0.12 U	0.12 U	1.2	**240**	0.12 U	0.12 U	0.12 U	0.12 U		
Tetrachloroethene (PCE)	5		0.35 J	0.10 U	1.5	**310**	1.2	0.78 J	0.10 U	0.10 U	0.10 U		
Toluene	5		0.16 J	0.15 U	0.15 U	0.15 U	**9.2**	2.0	2.0	0.15 U	2.5		
trans-1,2-Dichloroethene	5		1.9	0.13 U	0.13 U	4.7	0.13 U	2.1	0.13 U	0.13 U	0.13 U		
trans-1,3-Dichloropropene	0.4		0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U		
Trichloroethene (TCE)	5		0.79 J	0.090 U	0.090 U	**200**	0.43 J	0.20 J	0.090 U	0.090 U	0.090 U		
Vinyl chloride	2		0.88 J	0.14 U	0.14 U	**47**	0.14 U	**3.0**	0.14 U	0.14 U	0.14 U		
Xylenes, Total	NS		0.36 U	0.36 U	0.36 U	30	440	27	130	0.36 U	0.36 U		
Total VOCs			18.2	1.4	1.5	815.3	996.5	67.6	346.5	0.0	2.5	0.0	
SVOCs (Method 8270B) Analyte	Groundwater Quality Std (ug/L)	Not Sampled	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
1,2 dichlorobenzene	3												
1,3 dichlorobenzene	3												
Acenaphthene	20		**130**	2.7 U	2.7 U	3.3 J	**27 U**	**23**	**110**	2.7 U	2.7 U		
Acenaphthylene	NS		4.7 J	2.7 U	2.7 U	48	31 JD	32	5.5 U	2.7 U	2.7 U		
Anthracene	NS or 50*		2.8 U	2.8 U	2.8 U	2.8 U	28 U	2.8 U	5.7 U	2.8 U	2.8 U		
Benzo(a)anthracene	NS or 0.002*		0.27 U	0.27 U	0.27 U	0.27 U	2.7 U	0.27 U	0.55 U	0.27 U	0.27 U		
Benzo(a)pyrene	ND		0.14 U	0.14 U	0.14 U	**0.27** J	1.4 U	0.14 U	0.28 U	0.14 U	0.14 U		
Benzo(b)fluoranthene	NS or 0.002*		0.26 U	0.26 U	0.26 U	**0.29** J	**2.6 U**	0.26 U	**0.53 U**	0.26 U	0.26 U		
Dibenzofuran	NS		2.8 U	2.8 U	2.8 U	2.8 U	28 U	2.8 U	5.7 U	2.8 U	2.8 U		
Diphenyl	5		2.8 U	2.8 U	2.8 U	**6.0** J	28 U	2.8 U	**5.7** J	2.8 U	2.8 U		
Flourene	NS or 50*		5.0 J	2.8 U	2.8 U	8.8 J	28 U	2.8 U	13 J	2.8 U	2.8 U		
2-Methylnaphthalene	NS		3.0 U	3.0 U	3.0 U	60	72 JD	3.0 U	140	3.0 U	3.0 U		
Naphthalene	NS or 10*		5.2 J	2.7 U	2.7 U	**240**	**1500** D	**34**	**410**	2.7 U	2.7 U		
Phenanthrene	NS or 50*		3.2 U	3.2 U	3.2 U	3.1 U	31 U	3.2 U	6.3 U	3.2 U	3.2 U		
Pyrene	NS or 50*		2.9 U	2.9 U	2.9 U	2.9 U	29 U	2.9 U	5.9 U	2.9 U	2.9 U		
Total SVOCs			144.9	0.0	0.0	366.7	1603.0	89.0	678.7	0.0	0.0	0.0	

Notes:
VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
ug/L = micrograms per liter
Groundwater Quality Standard from: 6 NYCRR Part 703
NS = No Standard
* = Guidance Value from: NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1) groundwater standards.
ND = Not Detectable
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 5
Summary of Groundwater Quality - Exterior: 2012
Belle Harbor Shopping Center, Belle Harbor, New York

	Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
	Laboratory ID	460-41785-3	460-41785-2	460-41785-11	460-41785-7	460-41879-5	460-41884-3	460-41884-4	460-41879-2	460-41785-10	460-41884-1	460-41785-4
	Sample ID	**MW-101S**	**MW-101D**	**MW-102S**	**MW-102D**	**MW-103**	**MW-104S**	**MW-104A-S**	**MW-104D**	**MW-105S**	**MW-106S**	**MW-107S**
	Sample Date	06/26/12	06/26/12	06/27/12	06/26/12	06/29/12	06/27/12	06/27/12	06/28/12	06/27/12	06/27/12	06/26/12
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
VOCs (Method 8260B) Analyte	Groundwater Quality Std (ug/L)											
4-Methyl-2-pentanone (MIBK)	NS	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U
Acetone	50.00	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Benzene	1	0.080 U	0.080 U	0.61 J	**2.1**	0.16 J	0.080 U	0.080 U	0.080 U	0.080 U	0.56 J	0.27 J
Carbon disulfide	60	0.13 U	1.5	0.40 J	0.13 U	0.57 J	0.13 U	0.45 J	0.52 J	0.13 U	0.13 U	0.13 U
Chloroform	7	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U
cis-1,2-Dichloroethene	5	0.18 U	0.18 U	1.0	0.18 U	0.18 U	1.1	0.53 J	0.24 J	0.18 U	**6.4**	0.18 U
1,1-Dichloroethene	5	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U
Ethylbenzene	5	0.10 U	0.10 U	**270**	**140**	0.17 J	0.10 U	0.10 U	0.10 U	**40**	**69**	0.95 J
Isopropylbenzene	5	0.080 U	0.080 U	**20**	**10**	1.5	0.080 U	0.080 U	0.088 J	4.5	2.3	0.52 J
Methylene chloride	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
MTBE	NS	0.14 U	0.14 U	0.14 U	0.30 J	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Styrene	5	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	0.39 J	0.12 U
Tetrachloroethene (PCE)	5	0.61 J	0.10 U	0.45 J	0.10 U	0.63 J	**23**	2.9	1.4	0.10 U	2.7	0.10 U
Toluene	5	0.15 U	0.15 U	**29**	1.6	0.15 U	0.15 U	0.15 U	0.15 U	3.1	**9.5**	0.15 U
trans-1,2-Dichloroethene	5	0.13 U	0.13 U	3.4	0.14 J	0.39 J	0.13 U	0.13 U	0.13 U	0.13 U	2.9	0.13 U
trans-1,3-Dichloropropene	0.4	0.24 U	0.24 U	0.24 U	0.24 U	0.24 J	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Trichloroethene (TCE)	5	0.090 U	0.090 U	0.34 J	0.090 U	0.12 J	0.96 J	2.1	0.37 J	0.090 U	0.85 J	0.090 U
Vinyl chloride	2	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	**6.5**	0.14 U
Xylenes, Total	NS	0.36 U	0.36 U	120	79	15	0.36 U	0.36 U	0.36 U	39	42	1.2 J
Total VOCs		0.6	1.5	445.2	233.1	18.8	25.1	6.0	2.6	86.6	143.1	2.9
SVOCs (Method 8270B) Analyte	Groundwater Quality Std (ug/L)	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1,2 dichlorobenzene	3											
1,3 dichlorobenzene	3											
Acenaphthene	20	2.8 U	2.8 U	**110**	15 **J**	2.7 U	2.7 U	2.7 U	2.7 U	**21**	**43**	2.8 U
Acenaphthylene	NS	2.8 U	2.8 U	40	5.5 U	2.7 U	2.7 U	2.7 U	2.7 U	5.5 U	24	2.8 U
Anthracene	NS or 50*	2.9 U	2.9 U	5.7 U	5.7 U	2.8 U	2.8 U	2.8 U	2.8 U	5.7 U	2.8 U	2.9 U
Benzo(a)anthracene	NS or 0.002*	0.28 U	0.28 U	**1.0** J	**1.2** J	0.27 U	0.27 U	0.27 U	0.27 U	0.55 U	0.27 U	**0.42** J
Benzo(a)pyrene	ND	0.14 U	0.14 U	0.28 U	**0.72** **J**	0.14 U	0.14 U	0.14 U	0.14 U	0.28 U	0.14 U	0.14 U
Benzo(b)fluoranthene	NS or 0.002*	0.27 U	0.27 U	0.53 U	**0.70** **J**	0.26 U	0.26 U	0.26 U	0.26 U	0.53 U	0.26 U	0.27 U
Dibenzofuran	NS	2.9 U	2.9 U	7.5 J	5.7 U	2.8 U	2.8 U	2.8 U	2.8 U	5.7 U	2.8 U	2.9 U
Diphenyl	5	2.9 U	2.9 U	**30**	5.7 U	2.8 U	2.8 U	2.8 U	2.8 U	5.7 U	2.8 U	2.9 U
Flourene	NS or 50*	2.9 U	2.9 U	35	5.7 U	2.8 U	2.8 U	2.8 U	2.8 U	5.7 U	2.8 U	2.9 U
2-Methylnaphthalene	NS	3.1 U	3.1 U	6.1 U	48	3.0 U	3.0 U	3.0 U	3.2 U	47	3.0 U	3.1 U
Naphthalene	NS or 10*	2.8 U	2.8 U	**320**	**440**	**14**	6.8 J	2.7 U	2.8 U	**290**	**18**	2.8 U
Phenanthrene	NS or 50*	3.2 U	3.2 U	23	6.3 U	3.2 U	3.2 U	3.2 U	3.3 U	6.3 U	3.2 U	3.2 U
Pyrene	NS or 50*	3.0 U	3.0 U	5.9 U	5.9 U	2.9 U	2.9 U	2.9 U	3.1 U	5.9 U	2.9 U	3.0 U
Total SVOCs		0.0	0.0	574.5	505.6	14.0	6.8	0.0	0.0	358.0	85.0	0.42

Notes:
VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
ug/L = micrograms per liter
Groundwater Quality Standard from: 6 NYCRR Part 703
NS = No Standard
* = Guidance Value from: NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1) groundwater standards.
ND = Not Detectable
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 5a
Summary of Groundwater Quality - Exterior: 2012 - 2018
Belle Harbor Shopping Center, Belle Harbor, New York

Medium		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Laboratory ID		460-41879-3	460-149439-1	460-41879-4	460-149439-2	460-41884-5	460-149439-3	460-41884-3	460-149439-4	460-41879-2	460-149439-5	460-41884-1	460-149439-6
Sample ID		**MW-4**	**MW-4**	**MW-4D**	**MW-4D**	**MW-5**	**MW-5**	**MW-104S**	**MW-104S**	**MW-104D**	**MW-104D**	**MW-106S**	**MW-106S**
Sample Date		06/29/12	01/31/18	06/29/12	01/31/18	06/27/12	01/31/18	06/27/12	01/31/18	06/28/12	01/31/18	06/27/12	01/31/18
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
VOCs (Method 8260B) Analyte	Groundwater Quality Std (ug/L)												
4-Methyl-2-pentanone (MIBK)	NS	0.99 U	0.63 U	0.99 U	0.88 J	0.99 U	0.63 U U	0.99 U	0.63 U	0.99 U	0.63 U	0.99 U	0.63 U
Acetone	50.00	2.7 U	1.6 J	2.7 U	1.8 J	2.7 U	1.1 U U	2.7 U	1.1 U	2.7 U	1.1 U	2.7 U	1.1 U
Benzene	1	0.099 J	0.090 U	0.080 U	0.090 U	0.18 J	0.12 J	0.080 U	0.090 U	0.080 U	0.090 U	0.56 J	0.40 J
Carbon disulfide	60	0.13 U	0.22 U	0.13 U	0.22 U	0.13 U	0.22 U	0.13 U	0.22 U	0.52 J	0.22 U	0.13 U	0.22 U
Chloroform	7	0.40 J	0.22 U	0.080 U	0.22 U	0.080 U	0.22 U	0.080 U	0.22 U	0.080 U	0.22 U	0.080 U	0.22 U
cis-1,2-Dichloroethene	5	**220**	**340**	0.23 J	0.26 U	0.58 J	1.4	1.1	2.1	0.24 J	0.26 U	**6.4**	4.6
1,1-Dichloroethene	5	0.33 J	0.34 U	0.090 U	0.34 U	0.090 U	0.34 U	0.090 U	0.34 U	0.090 U	0.34 U	0.090 U	0.34 U
Ethylbenzene	5	0.56 J	0.33 J	**300**	**95**	**28**	0.30 U	0.10 U	0.30 U	0.10 U	0.30 U	**69**	0.31 J
Isopropylbenzene	5	1.0	0.71 J	**5.4**	**5.0**	3.8	0.32 U	0.080 U	0.32 U	0.088 J	0.32 U	2.3	0.38 J
Methylene Chloride	5	0.18 U	0.48 J	0.18 U	0.56 J	0.18 U	0.66 J	0.18 U	0.45 J	0.18 U	0.57 J	0.18 U	0.50 J
MTBE	NS	0.14 U	0.13 U	0.14 U	0.13 U	0.14 U	0.13 U	0.14 U	0.13 U	0.14 U	0.13 U	0.14 U	0.13 U
Styrene	5	1.2	0.17 U	**240**	**13**	0.12 U	0.17 U	0.12 U	0.17 U	0.12 U	0.17 U	0.39 J	0.17 U
Tetrachloroethene (PCE)	5	**310**	**5.1**	1.2	0.12 U	0.78 J	0.23 J	**23**	**5.8**	1.4	0.59 J	2.7	0.12 U
Toluene	5	0.15 U	0.25 U	**9.2**	1.9	2.0	0.25 U	0.15 U	0.25 U U	0.15 U	0.25 U	**9.5**	0.25 U
trans-1,2-Dichloroethene	5	4.7	**33**	0.13 U	0.18 U	2.1	2.9	0.13 U	0.18 U	0.13 U	0.18 U	2.9	0.20 J
trans-1,3-Dichloropropene	0.4	0.24 U	0.19 U	0.24 U	0.19 U	0.24 U	0.19 U	0.24 U	0.19 U	0.24 U	0.19 U	0.24 U	0.19 U
Trichloroethene (TCE)	5	**200**	**50**	0.43 J	0.22 U	0.20 J	0.30 J	0.96 J	0.97 J	0.37 J	0.22 U	0.85 J	0.22 U
Vinyl chloride	2	**47**	**110**	0.14 U	0.060 U	**3.0**	1.1	0.14 U	0.060 U	0.14 U	0.060 U	**6.5**	**4.0**
Xylenes, Total	NS	30	1.38 J	440	104	27	0.60 U	0.36 U	0.60 U	0.36 U	0.60 U	42	0.40 J
Total VOCs		815.3	542.6	996.5	222.14	67.6	6.71	25.1	9.32	2.6	1.16	143.1	10.79
SVOCs (Method 8270B) Analyte	Groundwater Quality Std (ug/L)	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Acenaphthene	20	3.3 J	11	**27 U**	17 J	**23**	19	2.7 U	0.88 U	2.7 U	0.88 U	**43**	**30**
Acenaphthylene	NS	48	2.4 J	31 JD	9 J	32	7.5 J	2.7 U	0.65 U	2.7 U	0.65 U	24	6.7 J
Anthracene	NS or 50*	2.8 U	0.78 J	28 U	2.9 U	2.8 U	0.57 U	2.8 U	0.57 U	2.8 U	0.57 U	2.8 U	0.57 U
Benzo(a)anthracene	NS or 0.002*	0.27 U	0.55 U	2.7 U	2.8 U	0.27 U	0.55 U	0.27 U	0.55 U	0.27 U	0.55 U	0.27 U	0.55 U
Benzo(a)pyrene	ND	**0.27** J	0.16 U	1.4 U	0.8 U	0.14 U	0.16 U	0.14 U	0.16 U	0.14 U	0.16 U	0.14 U	0.16 U
Benzo(b)fluoranthene	NS or 0.002*	**0.29** J	0.44 U	**2.6 U**	2.2 U	0.26 U	0.44 U	0.26 U	0.44 U	0.26 U	0.44 U	0.26 U	0.44 U
Dibenzofuran	NS	2.8 U	1.1 J	28 U	4.3 U	2.8 U	0.85 U	2.8 U	0.85 U	2.8 U	0.85 U	2.8 U	0.85 U
Diphenyl (1,1 Biphenyl)	5	**6.0** J	3.2 J	28 U	5.6 J	2.8 U	0.63 U	2.8 U	0.63 U	2.8 U	0.63 U	2.8 U	0.63 U
Flourene	NS or 50*	8.8 J	2.0 J	28 U	5.1 J	2.8 U	1.3 J	2.8 U	0.80 U	2.8 U	0.80 U	2.8 U	0.80 U
2-Methylnaphthalene	NS	60	0.88 U	72 JD	27 J	3.0 U	0.88 U	3.0 U	0.88 U	3.2 U	0.88 U	3.0 U	0.88 U
Naphthalene	NS or 10*	**240**	1.3 J	**1500** D	**770**	**34**	0.80 U	6.8 J	0.80 U	2.8 U	0.80 U	**18**	0.80 U
Phenanthrene	NS or 50*	3.1 U	3.6 J	31 U	3.3 U	3.2 U	0.65 U	3.2 U	0.65 U	3.3 U	0.65 U	3.2 U	0.65 U
Pyrene	NS or 50*	2.9 U	0.91 J	29 U	4.2 U	2.9 U	0.83 U	2.9 U	0.83 U	3.1 U	0.83 U	2.9 U	0.83 U
Total SVOCs		366.7	26.29	1603.0	833.7	89.0	27.8	6.8	0.0	0.0	0.0	85.0	36.7

Notes:
VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
ug/L = micrograms per liter
Groundwater Quality Standard from: 6 NYCRR Part 703
* = Guidance Value from: NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1) groundwater standards
NS = No Standard
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 6
Summary of Groundwater Quality Samples - Interior: 2012
Belle Harbor Shopping Center, Belle Harbor, New York

	Sample Location	Citi Bank		Ciros Pizza		Vacant Unit		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		SVP-9		Trip
	Sample Date	03/19/12		03/19/12		03/08/12		03/19/12
	Units	ug/L		ug/L		ug/L		ug/L
VOCs (Method 8260B)	Groundwater							
Analyte	Quality Std (ug/L)							
Acetone	50	2.7 U		16		13 U		2.7 U
Benzene	1	0.73	J	0.52	J	0.75	J	0.080 U
Carbon disulfide	60	3.0		2.0		2.7	J	0.13 U
cis-1,2-Dichloroethene	5	3.6		1.7		**7.1**		0.18 U
1,2 Dichlorobenzene	3	NR		NR		1.1 U		NR
1,4-Dioxane	NS	NR		NR		180	J	NR
Ethylbenzene	5	**12**		3.8		**320**		0.10 U
Isopropylbenzene	5	NR		NR		**46**		NR
m&P-Xylene	NS	NR		NR		67		NR
Methylene chloride	5	0.39	J	0.64	J	0.90 U		0.18 U
o-Xylene	5	NR		NR		**170**		NR
Styrene	5	0.38	J	0.25	J	0.60 U		0.12 U
Tetrachloroethene (PCE)	5	2.7		**6.1**		1.2	J	0.10 U
Toluene	5	0.47	J	0.43	J	**41**		0.15 U
trans-1,2-Dichloroethene	5	2.1		1.6		2.8	J	0.13 U
Trichloroethene (TCE)	5	2.0		4.7		0.45 U		0.090 U
Vinyl chloride	2	**2.2**		0.64	J	1.7	J	0.14 U
Xylenes, Total	NS	0.90	J	0.36 U		NR		0.36 U
Total VOCs		30.5		38.4		840.3		0.0

Notes:
VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
ug/L = micrograms per liter
Groundwater Quality Standard from: 6 NYCRR Part 703
NS = No Standard
* = Guidance Value from: NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1) groundwater standards.

Bold: concentration exceeds Groundwater Quality Standards
Bold: concentration exceeds Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
D = Sample results are obtained from a dilution
U = Analyzed for but not detected
NR = Not Reported

TABLE 6
Summary of Groundwater Quality Samples - Interior: 2012
Belle Harbor Shopping Center, Belle Harbor, New York

Sample Location		Citi Bank		Ciros Pizza		Vacant Unit		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		SVP-9		Trip
Sample Date		03/19/12		03/19/12		03/08/12		03/19/12
Units		ug/L		ug/L		ug/L		ug/L
SVOCs (Method 8270B) Analyte	Groundwater Quality Std (ug/L)							
Acenaphthene	20	**67**		**110**		**300**	D	NA
Acenaphthylene	NS	2.7 U		2.7	J	34	J D	NA
Anthracene	NS or 50*	2.8 U		3.9	J	**84**	J D	NA
Benzo(a)anthracene	NS or 0.002*	0.27 U		**0.96**	J	**44**	D	NA
Benzo(a)pyrene	ND	0.14 U		**0.54**	J	**27**	D	NA
Benzo(b)fluoranthene	NS or 0.002*	**0.26**	J	**0.65**	J	**20**	D	NA
Benzo(k)fluoranthene	NS or 0.002*	0.26 U		0.26 U		**8.2**	J D	NA
bis(2-Ethylhexyl)phthalate	5	2.0 U		2.66	J	20 U		NA
Carbazole	NS	3.2 U		4.6	J	32 U		NA
Chrysene	NS or 0.002*	3.1 U		3.1 U		**52**	J D	NA
Dibenz(a,h)anthracene	NS	0.091	J	0.091	J	0.90 U		NA
Dibenzofuran	NS	2.8 U		8.7	J	28 U		NA
Diphenyl	5	NR		NR		**86**	J D	NA
Flouranthrene	NS or 50*	3.2 U		3.2 U		**87**	J D	NA
Flourene	NS or 50*	2.8 U		16		**160**	D	NA
Indeno(1,2,3-cd)pyrene	NS or 0.002*	**0.15**	J	**0.15**	J	**7.7**	J D	NA
2-Methylnaphthalene	NS	3.0 U		3.0 U		96	J D	NA
Naphthalene	NS or 10*	2.7 U		2.7 U		**2100**	D	NA
Phenanthrene	NS or 50*	3.1 U		13		**330**	D	NA
Pyrene	NS or 50*	2.9 U		2.9 U		**160**	D	NA
Total SVOCs		67.5		164.0		3596		

Notes:
VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
ug/L = micrograms per liter
Groundwater Quality Standard from: 6 NYCRR Part 703
NS = No Standard
* = Guidance Value from: NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1) groundwater standards.
ND = Not Detectable

Bold: concentration exceeds Groundwater Quality Standards
Bold: concentration exceeds Guidance Value
J = Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration.
D = Sample results are obtained from a dilution
U = Analyzed for but not detected
NR = Not Reported
NA = Not Applicable

TABLE 7
Summary of Sub-Slab Vapor and Indoor Air Analytical Results: Grocery Store Unit: 2015 - 2018
A&P Shopping Center
Belle Harbor, New York

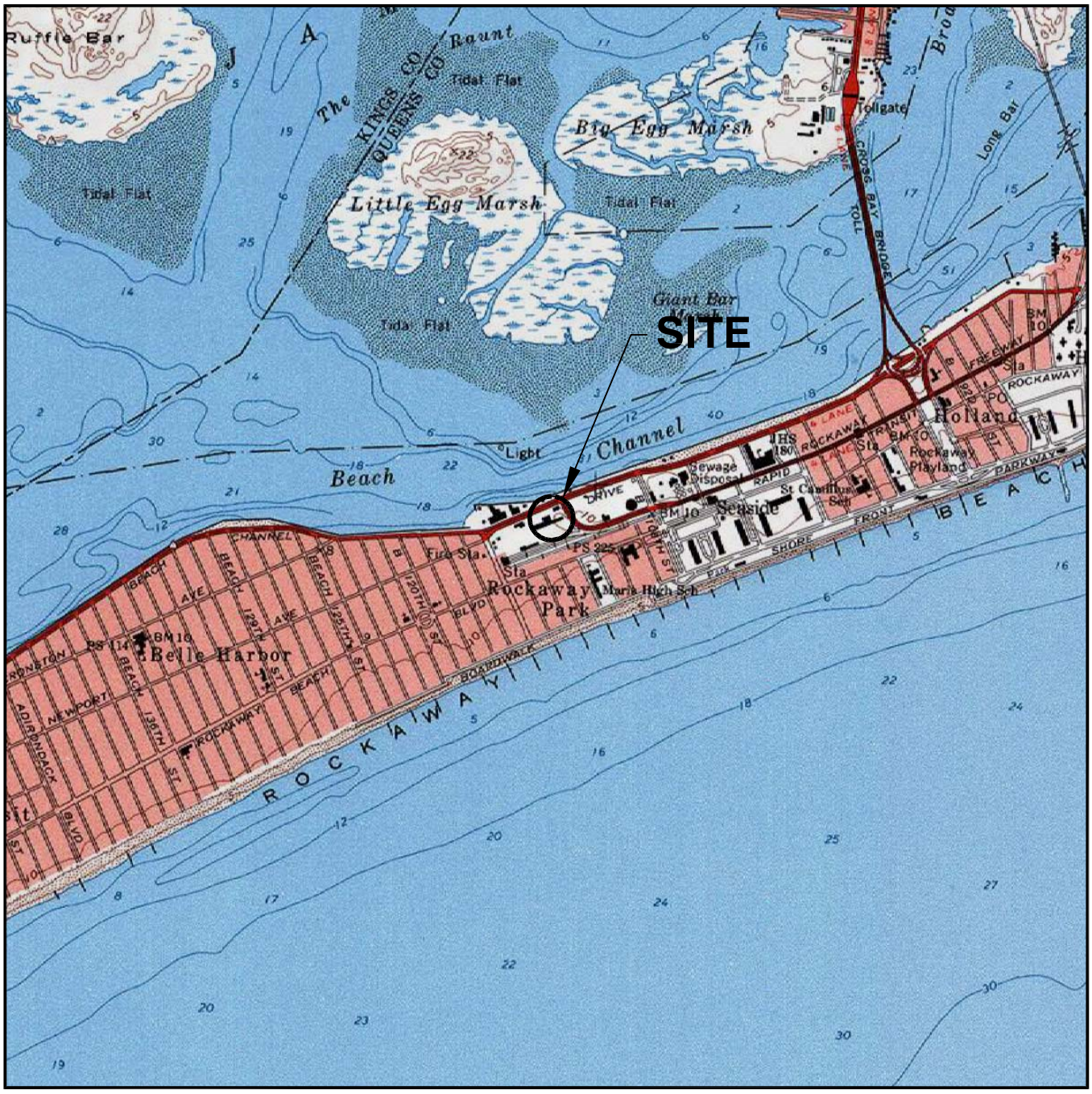
Sample Location	NYSDOH Standards [1]		Stop & Shop Grocery Store				Ambient	
Medium	Subsurface Vapors	Indoor Air	Sub-Slab Vapor	Sub-Slab Vapor	Indoor Air	Indoor Air	Outdoor Air	Outdoor Air
Sample ID			SV-103	SVP-103	IA-103	IA-S & S-103	OA-101	Ambient
Collection Date			04/16/15	01/31/18	04/16/15	01/31/18	04/16/15	01/31/18
Units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Analyte								
1,1,1-Trichloroethane	NS	NS	< 119	< 1200	< 1.09	< 1.1	< 1.09	< 1.1
1,1,2,2-Tetrachloroethane	NS	NS	< 150	< 1400	< 1.37	< 1.4	< 1.37	< 1.4
1,1,2Trichloro-1,2,2-trifluoroethane	NS	NS	< 168	< 1600	0.498 J	< 1.5	0.5 J	< 1.5
1,1-Dichloroethane	NS	NS	< 88.6	< 850	< 0.809	< 0.81	< 0.809	< 0.81
1,1-Dichloroethene	NS	NS	< 86.8	< 150	< 0.793	< 0.14	< 0.793	< 0.14
1,2,4-Trimethylbenzene	NS	NS	< 108	< 1000	0.442 J	< 0.98	< 0.983	< 0.98
1,2-Dichloroethane	NS	NS	< 88.6	< 850	< 0.809	< 0.81	< 0.809	< 0.81
1,3-Butadiene	NS	NS	< 48.4	< 470	< 0.442	< 0.44	< 0.442	< 0.44
1,4-Dichlorobenzene	NS	NS	< 132	< 1300	0.836 J	< 1.2	< 1.2	< 1.2
1,4-Dioxane	NS	NS	< 78.9	< 19000	< 0.721	< 18	< 0.721	< 18
2-Butanone (MEK)	NS	NS	< 162	< 1600	0.979 J	< 1.5	0.463 J	< 1.5
2-Propanol (Isopropyl Alcohol)	NS	NS	< 135	< 13000	8.01	23	< 1.23	< 12
4-Ethyltoluene	NS	NS	< 108	< 1000	< 0.983	< 0.98	< 0.983	< 0.98
4-Methyl-2-pentanone (MIBK)	NS	NS	< 225	< 2200	< 2.05	< 2.0	< 2.05	< 2.0
Acetone	NS	NS	93.6 J	< 13000	9.38	14	2.38 J	< 12
Benzene	NS	NS	< 70	< 670	0.364 J	0.79	0.335 J	1.2
Carbon Disulfide	NS	NS	< 68.2	< 1600	< 0.623	< 1.6	< 6.23	< 1.6
Carbon Tetrachloride	NS	NS	< 138	< 230	0.237 J	0.49	< 1.26	0.40
Chloroform	NS	NS	51.3 J	< 1000	1.12	< 0.98	< 0.977	< 0.98
Chloromethane	NS	NS	< 45.2	< 1100	1.1	1.2	0.869	1.1
cis-1,2-Dichloroethene	NS	NS	< 86.8	< 150	< 0.793	< 0.14	< 0.793	< 0.14
Cyclohexane	NS	NS	< 75.4	< 730	< 0.688	< 0.69	< 0.688	< 0.69
Dichlorodifluoromethane (Freon 12)	NS	NS	68.2 J	< 2600	1.37	2.5	1.48	< 2.5
Ethyl Benzene	NS	NS	< 95.1	< 920	0.369 J	< 0.87	< 0.869	< 0.87
Heptane	NS	NS	< 89.7	< 860	0.508 J	< 0.82	< 0.82	< 0.82
Hexane	NS	NS	< 77.2	< 740	0.3 J	1.6	< 0.705	1.1
m,p-Xylene	NS	NS	< 190	< 2300	0.812 J	< 2.2	< 1.74	< 2.2
Methylene Chloride	NS	60	< 190	< 1800	1.49 J	< 1.7	1.74 J	< 1.7
n-Butane	NS	NS	45.2 J	< 1300	18.4	16	2.45	7.5
o-Xylene	NS	NS	< 95.1 J	< 920	0.378 J	< 0.87	< 0.869	< 0.87
Styrene	NS	NS	< 93.2	< 900	0.571 J	< 0.85	< 0.852	< 0.85
Tert-butyl Alcohol	NS	NS	24.6 J	< 16000	0.318 J	< 15	< 1.52	< 15
Tetrachloroethene (PCE)	NS	30	115,000	150,000	1.57	1.6	< 1.36	3.7
Toluene	NS	NS	< 82.5	< 800	3.32	1.5	0.452 J	1.7
trans-1,2-Dichloroethene	NS	NS	< 86.8	< 840	< 0.793	< 0.79	< 0.793	< 0.79
Trichloroethene (TCE)	NS	2	67.2 J	430	< 1.07	< 0.19	< 1.07	< 0.19
Trichlorofluoromethane (Freon 11)	NS	NS	< 123	< 1200	0.961 J	1.1	1.11 J	< 1.1
Vinyl Chloride	NS	NS	< 56	< 94	< 0.511	< 0.089	< 0.511	< 0.089
Acetaldehyde	NS	NS	120 J	NT	4.5 J	NT	2.52 J	NT
Acrolein	NS	NS	< 126	NT	0.303 J	NT	< 1.15	NT
Ethanol	NS	NS	133 J	NT	298	NT	10.9	NT
n_Octane (C8)	NS	NS	< 102	NT	1.21	NT	< 0.934	NT
n-Decane (C10)	NS	NS	< 127	NT	10.9	NT	< 1.16	NT
n-Dodecane (C12)	NS	NS	213 J	NT	5.95 J	NT	1.39 J	NT
n-Nonane (C9)	NS	NS	< 115	NT	4.99	NT	< 1.05	NT
n-Undecane (C11)	NS	NS	< 140	NT	2.99	NT	< 1.28	NT
Pentane	NS	NS	24.9 J	NT	20.2	NT	1.83	NT
Total VOCs			115841.0	150430.0	402.4	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

FIGURES



MAP SOURCE:

NORTH

DeLORME 3D TOPOQUADS

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

2000 0 2000

Scale in feet

Stantec Consulting Services Inc.

STANTEC OFFICE LOCATION: AUBURN, NEW HAMPSHIRE				DRAWING TITLE: SITE LOCATION
DATE PREPARED: 8-02-12	DESIGNED BY: JJW	DRAWN BY: JJW	CHECKED BY: DFM	REVIEWED BY: DFM
REVISION DATE:	REVISION NO:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
PROJECT NAME/FILE NAME: A&P ALOCUS		PROJECT NUMBER/PHASE: 191710624	SCALE: 1:24000	PREPARED FOR: A&P

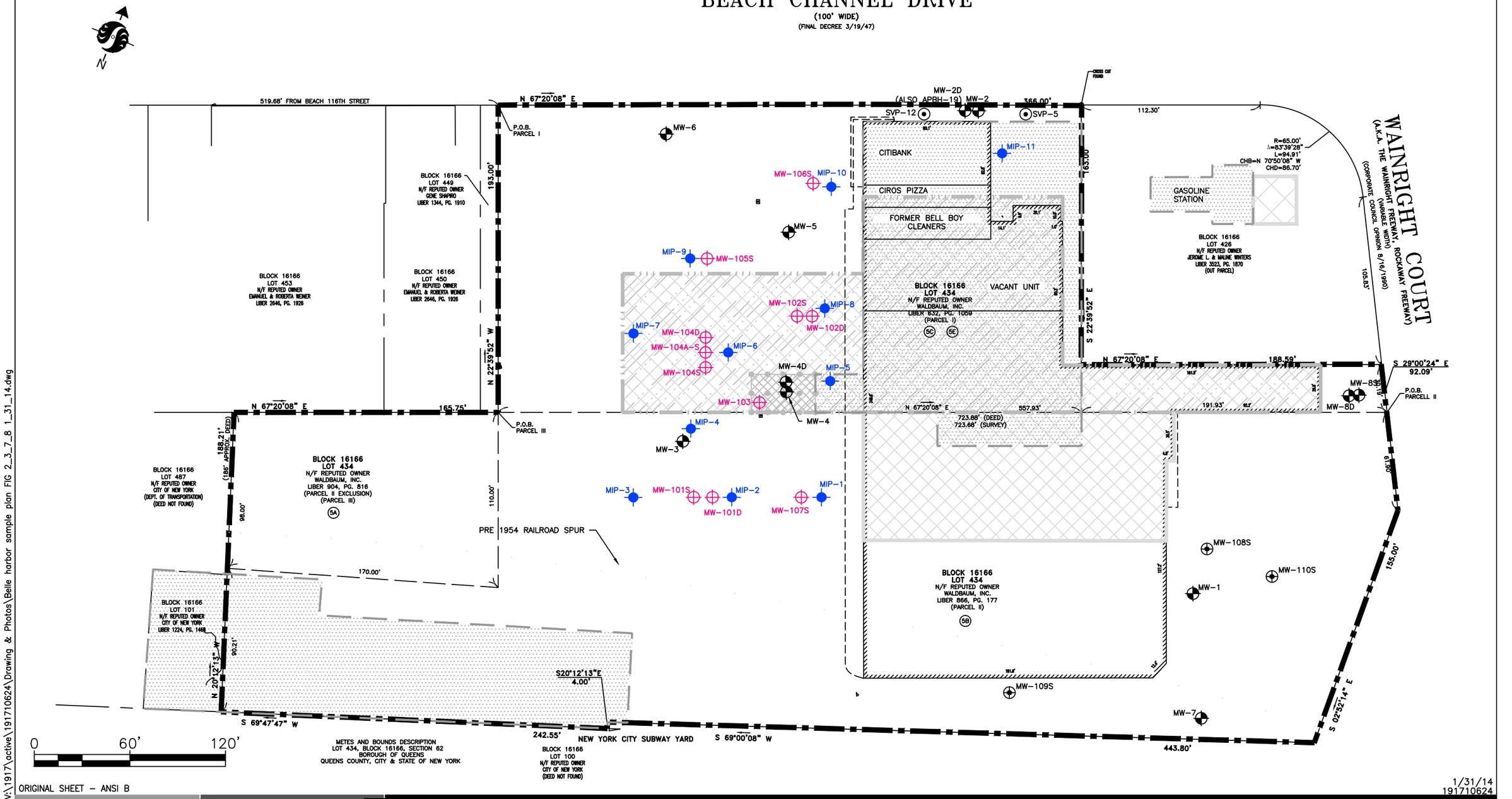
BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
BELLE HARBOR, NY

FIGURE NO. 1

BEACH CHANNEL DRIVE

(100' WIDE)

(FINAL DECREE 3/19/47)



METES AND BOUNDS DESCRIPTION
LOT 434, BLOCK 16166, SECTION 62
BOROUGH OF QUEENS
QUEENS COUNTY, CITY & STATE OF NEW YORK

BLOCK 16166
LOT 100
N/F REPUTED OWNER
CITY OF NEW YORK
(DEED NOT FOUND)

ORIGINAL SHEET – ANSI B

1/31/14
191710624

V:\1917\active\191710624\Drawing & Photos\Belle harbor sample plan FIG 2_3_7_8 1_31_14.dwg

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Legend

- MW-3 — MONITOR WELL (INSTALLED BY OTHERS)
- 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
- VCP SITE BOUNDARIES

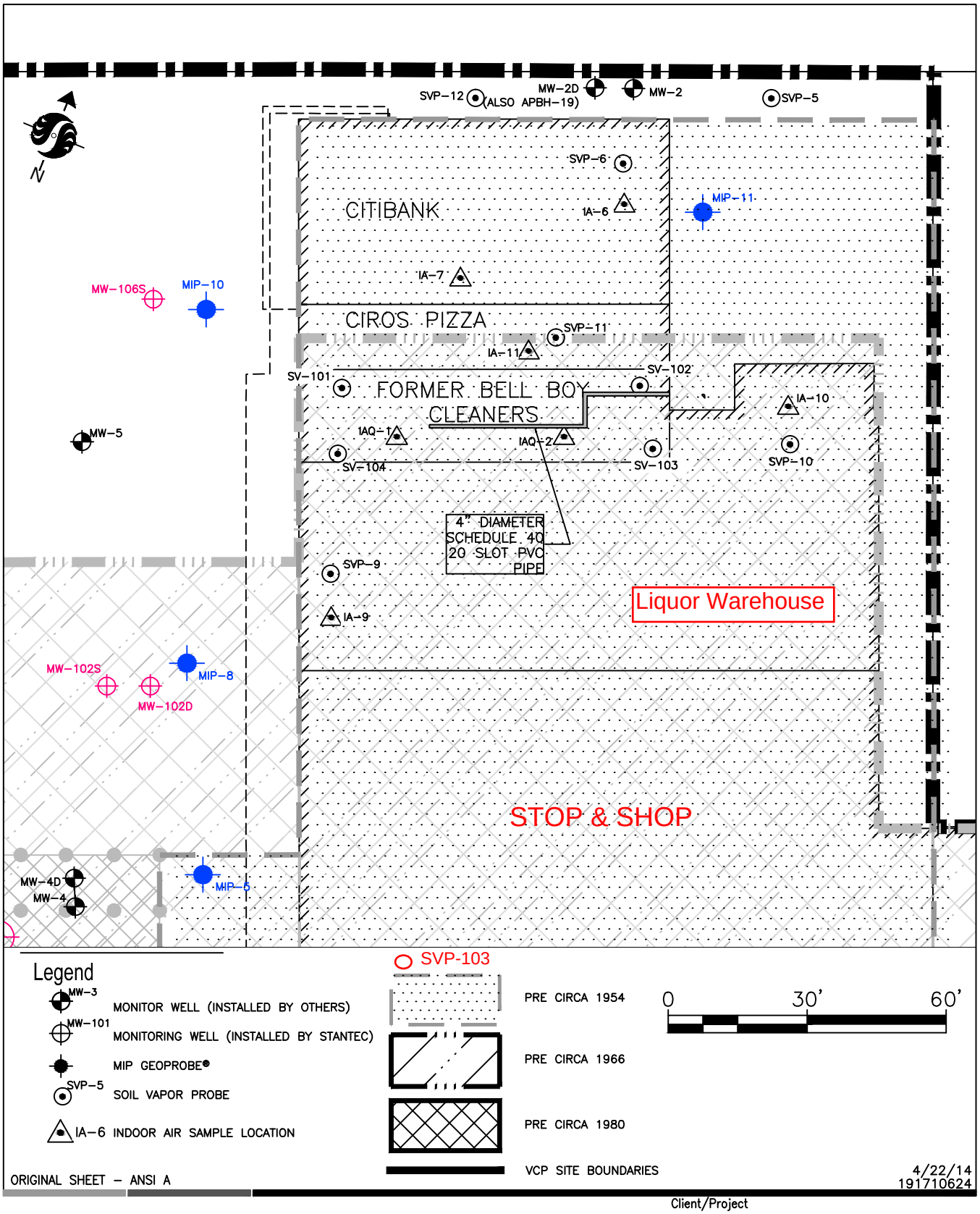
Notes

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



V:\1917\active\191710624\Drawing & Photos\Belle harbor interior sample plan FIG 3 4-22-14 .dwg

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

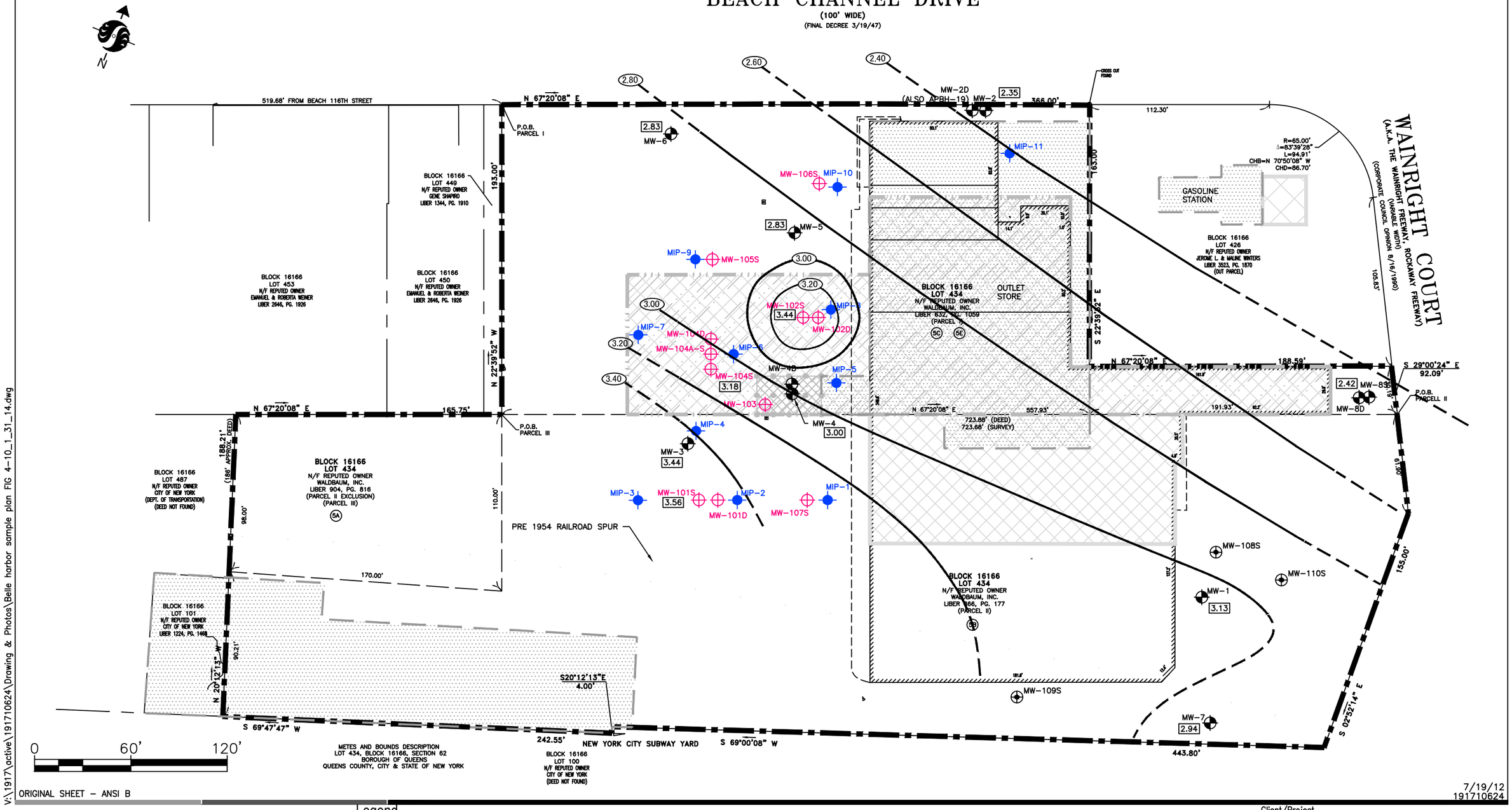
Figure No.
3

Title
INTERIOR
SAMPLE LOCATIONS

BEACH CHANNEL DRIVE

(100' WIDE)

(FINAL DECREE 3/19/47)



V:\1917\active\191710624\Drawing & Photos\Belle harbor sample plan FIG 4-10_1_31_14.dwg

ORIGINAL SHEET – ANSI B

7/19/12
191710624

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Legend

- MW-3 – MONITOR WELL (INSTALLED BY OTHERS)
- 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
- VCP SITE BOUNDARIES

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.

4

Title

GROUND WATER CONTOUR PLAN

MW-102	SCO (ppm)	May 2012	May 2012
Analyte		(6.6 - 7.2 ft)	(22 - 23 ft)
Benzo(a)anthracene	5.6	53	ND
Benzo(b)fluoranthene	5.6	34	ND
Benzo(a)pyrene	1	40	ND
Dibenz(a,h) anthracene	0.56	7.2	ND
Indeno(1,2,3-cd)pyrene	5.6	23	ND

MW-105	SCO (ppm)	May 2012
Analyte		(5.0 - 5.8 ft)
Benzo(a)pyrene	1	3.2
Dibenz(a,h) anthracene	0.56	0.62

MW-104	SCO (ppm)	May 2012
Analyte		(6.3 - 6.9 ft)
Benzo(a)anthracene	5.6	6.4
Benzo(a)pyrene	1	6.0
Dibenz(a,h) anthracene	0.56	1.3
Copper	270	783

MW-103	SCO (ppm)	May 2012
Analyte		(5.2 - 6.2 ft)
Benzo(a)pyrene	1	3.1

MW-107	SCO (ppm)	May 2012
Analyte		(6.0 - 6.9 ft)
Benzo(a)pyrene	1	1.4

MW-8	SCO (ppb)	May 2004
Analyte	Commercial	(4.5 - 6.0 ft)
Benzo(a)pyrene	1	2.5

B-110	SCO (ppm)	May 2012	May 2012
Analyte		(1 - 3 ft)	(5.5 - 7.5 FT)
Benzo(a)anthracene	5.6	10	ND
Benzo(b)fluoranthene	5.6	5.7	ND
Benzo(a)pyrene	1	3.3	ND
Dibenz(a,h) anthracene	0.56	1.1	ND
Total Cyanide	27	127	ND

SB-117		Jun 2015
Analyte	SCO (ppm)	(1 - 3 ft)
Total Cyanide	27	103

B-111	SCO (ppm)	May 2012
Analyte		(6.5 - 7.5 ft)
Benzo(a)pyrene	1	3.1

B-107	SCO (ppm)	May 2012	May 2012
Analyte		(8.5 - 10 ft)	(11 - 12 ft)
Benzo(a)anthracene	5.6	7.4	36
Benzo(b)fluoranthene	5.6	3.3	15
Benzo(a)pyrene	1	5.6	27
Dibenz(a,h) anthracene	0.56	0.56	3.1
Indeno(1,2,3-cd)pyrene	5.6	2	11

MW-1	SCO (ppm)	Mar 2003	Mar 2003
Analyte		(1.0 - 1.5 ft)	(7.0 - 7.5 ft)
Benzo(a)pyrene	1	0.73	4.0

B-104	SCO (ppm)	May 2012
Analyte		(9 - 10 ft)
Benzo(a)anthracene	5.6	16
Benzo(b)fluoranthene	5.6	6.6
Benzo(a)pyrene	1	12
Dibenz(a,h) anthracene	0.56	1.3

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Updated October 19, 2017
191711713

Legend

- MW-3 — MONITOR WELL (INSTALLED BY OTHERS)
- MW-101 — MONITORING WELL (INSTALLED BY STANTEC)
- MIP-2 — MIP GEOPROBE®
- SVP-6 — SUB-SLAB BORING (INSTALLED BY STANTEC)
- B-105 — SOIL BORING (INSTALLED BY GEI)
- SV-102/IAQ-102 — SUB-SLAB BORING, INDOOR AIR LOCATION (INSTALLED BY GEI)
- GP-4 — SOIL BORING (INSTALLED BY STANTEC)
- IAQ-1 / SV-1 — INDOOR AIR / SOIL GAS SAMPLE LOCATION
- HYDROGEN RELEASE COMPOUND (HRC) INJECTION AREA/POINTS – 2008
- ND — NOT DETECTED
- NA — NOT ANALYZED
- J — ESTIMATED CONCENTRATION
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE BOUNDARIES

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC. SEPTEMBER 2012.

DATA IN CHEM BOXES ARE ONLY FOR CHEMICALS ABOVE STANDARDS.

SEE SUPPLEMENTAL INVESTIGATION IMPLEMENTATION OF WORK PLAN REPORT OF MEMBRANE INTERFACE PROBE STUDY (MAY 2012) RESULTS FOR MIP RESULTS.

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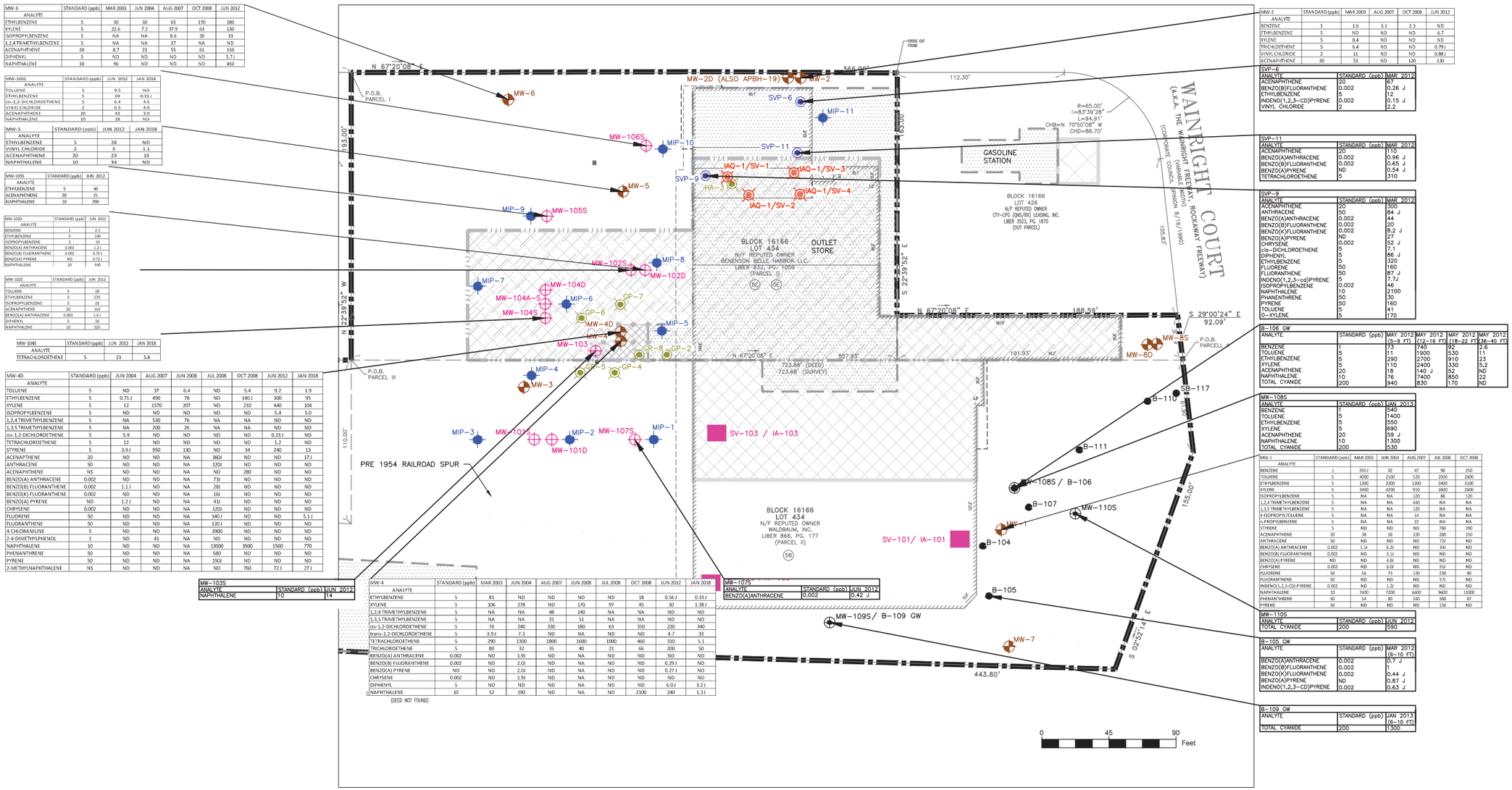
Client/Project
BELLE HARBOR SHOPPING CENTER
112-15 BEACH CHANNEL DRIVE
QUEENS (FAR ROCKAWAY), NEW YORK

Figure No. 5

Title
CONTAMINANTS IN SOIL EXCEEDING COMMERCIAL SOIL CLEANUP OBJECTIVES



MW-6	STANDARD (ppb)	MAR 2003	JUN 2004	AUG 2007	OCT 2008	JUN 2012
ANALYTE						
ETHYLBENZENE	5	30	10	65	170	180
XYLENE	5	22.6	7.2	17.9	63	130
ISOPROPYLBENZENE	5	NA	NA	8.6	20	33
1,2,4 TRIMETHYLBENZENE	5	NA	NA	27	NA	ND
ACENAPHTHENE	20	8.7	23	55	61	110
DIPHENYL	5	NO	ND	ND	ND	5.7 J
NAPHTHALENE	10	96	ND	ND	ND	410

MW-106S	STANDARD (ppb)	JUN 2012	JAN 2018
ANALYTE			
TOLUENE	5	9.5	ND
ETHYLBENZENE	5	69	0.31 J
cis-1,2-DICHLOROETHENE	5	6.4	4.6
VINYL CHLORIDE	2	6.5	4.0
ACENAPHTHENE	20	43	3.0
NAPHTHALENE	10	18	ND

MW-5	STANDARD (ppb)	JUN 2012	JAN 2018
ANALYTE			
ETHYLBENZENE	5	28	ND
VINYL CHLORIDE	2	3	1.1
ACENAPHTHENE	20	23	19
NAPHTHALENE	10	34	ND

MW-105S	STANDARD (ppb)	JUN 2012
ANALYTE		
ETHYLBENZENE	5	40
ACENAPHTHENE	20	21
NAPHTHALENE	10	290

MW-102D	STANDARD (ppb)	JUN 2012
ANALYTE		
BENZENE	1	2.1
ETHYLBENZENE	5	140
ISOPROPYLBENZENE	5	10
BENZO(A) ANTHRACENE	0.002	1.2 J
BENZO(B) FLUORANTHENE	0.002	0.70 J
BENZO(A) PYRENE	ND	0.72 J
NAPHTHALENE	10	440

MW-102S	STANDARD (ppb)	JUN 2012
ANALYTE		
TOLUENE	5	29
ETHYLBENZENE	5	270
ISOPROPYLBENZENE	5	20
ACENAPHTHENE	20	110
BENZO(A) ANTHRACENE	0.002	1.0 J
DIPHENYL	5	30
NAPHTHALENE	10	320

MW-104S	STANDARD (ppb)	JUN 2012	JAN 2018
ANALYTE			
TETRACHLOROETHENE	5	23	5.8

MW-4D	STANDARD (ppb)	JUN 2004	AUG 2007	JUN 2008	JUL 2008	OCT 2008	JUN 2012	JAN 2018
ANALYTE								
TOLUENE	5	ND	37	6.4	ND	5.4	9.2	1.9
ETHYLBENZENE	5	0.71 J	490	78	ND	140 J	300	95
XYLENE	5	12	1570	207	ND	210	480	104
ISOPROPYLBENZENE	5	ND	ND	ND	ND	ND	5.4	5.0
1,2,4 TRIMETHYLBENZENE	5	NA	530	76	NA	NA	ND	ND
1,3,5 TRIMETHYLBENZENE	5	NA	200	26	NA	NA	ND	ND
cis-1,2-DICHLOROETHENE	5	5.9	ND	ND	ND	ND	0.23 J	ND
TETRACHLOROETHENE	5	12	ND	ND	ND	ND	1.2	ND
STYRENE	5	3.9 J	950	130	ND	34	240	13
ACENAPTHENE	20	ND	ND	NA	360 J	ND	ND	17 J
ANTHRACENE	50	ND	ND	NA	120 J	ND	ND	ND
ACENAPHTHENE	NS	ND	ND	NA	ND	280	ND	ND
BENZO(A) ANTHRACENE	0.002	ND	ND	NA	7 J	ND	ND	ND
BENZO(B) FLUORANTHENE	0.002	1.1 J	ND	NA	28 J	ND	ND	ND
BENZO(K) FLUORANTHENE	0.002	ND	ND	NA	16 J	ND	ND	ND
BENZO(A) PYRENE	ND	1.2 J	ND	NA	41 J	ND	ND	ND
CHRYSENE	0.002	ND	ND	NA	120 J	ND	ND	ND
FLUORENE	50	ND	ND	NA	340 J	ND	ND	5.1 J
FLUORANTHENE	50	ND	ND	NA	120 J	ND	ND	ND
4-CHLORANILINE	5	ND	ND	NA	3900	ND	ND	ND
2-4-DIMETHYLPHENOL	1	ND	41	NA	ND	ND	ND	ND
NAPHTHALENE	10	ND	ND	NA	13000	3900	1500	770
PHENANTHRENE	50	ND	ND	NA	580	ND	ND	ND
PYRENE	50	ND	ND	NA	150 J	ND	ND	ND
2-METHYLNAPHTHALENE	NS	ND	ND	NA	ND	760	72 J	27 J

MW-103S	STANDARD (ppb)	JUN 2012
ANALYTE		
NAPHTHALENE	10	14

MW-4	STANDARD (ppb)	MAR 2003	JUN 2004	AUG 2007	JUN 2008	JUL 2008	OCT 2008	JUN 2012	JAN 2018
ANALYTE									
ETHYLBENZENE	5	81	ND	ND	ND	ND	18	0.56 J	0.33 J
XYLENE	5	106	278	ND	170	97	45	30	1.38 J
1,2,4 TRIMETHYLBENZENE	5	NA	NA	48	140	NA	NA	ND	ND
1,3,5 TRIMETHYLBENZENE	5	NA	NA	31	51	NA	NA	ND	ND
cis-1,2-DICHLOROETHENE	5	76	240	330	180	63	350	220	340
trans-1,2-DICHLOROETHENE	5	3.9 J	7.3	ND	NA	ND	ND	4.7	33
TETRACHLOROETHENE	5	290	1300	1800	1600	1000	460	330	5.1
TRICHLOROETHENE	5	80	32	35	40	21	66	200	50
BENZO(A) ANTHRACENE	0.002	ND	1.9 J	ND	NA	ND	ND	ND	ND
BENZO(B) FLUORANTHENE	0.002	ND	2.0 J	ND	NA	ND	ND	0.29 J	ND
BENZO(A) PYRENE	ND	ND	2.0 J	ND	NA	ND	ND	0.27 J	ND
CHRYSENE	0.002	ND	1.9 J	ND	NA	ND	ND	ND	ND
DIPHENYL	5	ND	ND	ND	NA	ND	ND	6.0 J	3.2 J
NAPHTHALENE	10	52	190	ND	NA	ND	2100	240	1.3 J

(DEED NOT FOUND)

MW-107S	STANDARD (ppb)	JUN 2012
ANALYTE		
BENZO(A)ANTHRACENE	0.002	0.42 J

MW-2	STANDARD (ppb)	MAR 2003	AUG 2007	OCT 2008	JUN 2012
ANALYTE					
BENZENE	1	1.6	3.1	2.3	ND
ETHYLBENZENE	5	ND	ND	ND	6.7
XYLENE	5	8.4	ND	ND	ND
TRICHLOETHENE	5	6.4	ND	ND	0.79 J
VINYL CHLORIDE	2	11	ND	ND	0.88 J
ACENAPHTHENE	20	53	ND	130	130

SVP-6	STANDARD (ppb)	MAR 2012
ANALYTE		
ACENAPHTHENE	20	97
BENZO(B)FLUORANTHENE	0.002	0.26 J
ETHYLBENZENE	5	12
INDENO(1,2,3-CD)PYRENE	0.002	0.15 J
VINYL CHLORIDE	2	2.2

SVP-11	STANDARD (ppb)	MAR 2012
ANALYTE		
ACENAPHTHENE	20	110
BENZO(A)ANTHRACENE	0.002	0.96 J
BENZO(B)FLUORANTHENE	0.002	0.65 J
BENZO(A)PYRENE	ND	0.54 J
TETRACHLOROETHENE	5	310

SVP-9	STANDARD (ppb)	MAR 2012
ANALYTE		
ACENAPHTHENE	20	300
ANTHRACENE	50	84 J
BENZO(A)ANTHRACENE	0.002	44
BENZO(B)FLUORANTHENE	0.002	20
BENZO(K)FLUORANTHENE	0.002	8.2 J
BENZO(A)PYRENE	ND	27
CHRYSENE	0.002	52 J
cis-DICHLOROETHENE	5	7.1
DIPHENYL	5	86 J
ETHYLBENZENE	5	320
FLUORENE	50	160
FLUORANTHENE	50	87 J
INDENO(1,2,3-cd)PYRENE	5	7.7J
ISOPROPYLBENZENE	0.002	46
NAPHTHALENE	10	2100
PHANENTHRENE	50	30
PYRENE	50	160
TOLUENE	5	41
O-XYLENE	5	170

B-106 GW	STANDARD (ppb)	MAY 2012 (5-9 FT)	MAY 2012 (12-16 FT)	MAY 2012 (18-22 FT)	MAY 2012 (36-40 FT)
ANALYTE					
BENZENE	1	73	740	92	2.6
TOLUENE	5	11	1900	530	11
ETHYLBENZENE	5	290	2700	910	23
XYLENE	5	110	2400	330	5.2
ACENAPHTHENE	20	18	140 J	52	ND
NAPHTHALENE	10	76	7400	850	22
TOTAL CYANIDE	200	940	830	170	ND

MW-108S	STANDARD (ppb)	JAN 2013
ANALYTE		
BENZENE	1	540
TOLUENE	5	1400
ETHYLBENZENE	5	550
XYLENE	5	690
ACENAPHTHENE	20	59 J
NAPHTHALENE	10	1300
TOTAL CYANIDE	200	530

MW-1	STANDARD (ppb)	MAR 2003	JUN 2004	AUG 2007	JUL 2008	OCT 2008
ANALYTE						
BENZENE	1	350 J	92	47	98	250
TOLUENE	5	4000	2100	520	2500	2600
ETHYLBENZENE	5	1300	2200	1300	2400	3100
XYLENE	5	3400	4200	910	2600	2600
ISOPROPYLBENZENE	5	NA	NA	120	88	120
1,2,4 TRIMETHYLBENZENE	5	NA	NA	460	NA	NA
1,3,5 TRIMETHYLBENZENE	5	NA	NA	120	NA	NA
4-ISOPROPYLTOLUENE	5	NA	NA	14	NA	NA
n-PROPYLBENZENE	5	NA	NA	22	NA	NA
STYRENE	5	ND	ND	ND	780	390
ACENAPHTHENE	20	38	58	230	280	350
ANTHRACENE	50	ND	ND	ND	72 J	ND
BENZO(A) ANTHRACENE	0.002	1.3 J	6.3 J	ND	34 J	ND
BENZO(B) FLUORANTHENE	0.002	ND	3.1 J	ND	ND	ND
BENZO(A) PYRENE	ND	ND	6.8 J	ND	ND	ND
CHRYSENE	0.002	ND	6.0 J	ND	55 J	ND
FLUORENE	50	56	73	130	230	90
FLUORANTHENE	50	ND	ND	ND	57 J	ND
INDENO(1,2,3-CD) PYRENE	0.002	ND	1.2 J	ND	ND	ND
NAPHTHALENE	10	7400	7200	6400	9600	13000
PHENANTHRENE	50	54	80	240	380	87
PYRENE	50	ND	ND	ND	150	ND

MW-110S	STANDARD (ppb)	JUN 2012
ANALYTE		
TOTAL CYANIDE	200	590

B-105 GW	STANDARD (ppb)	MAR 2012 (6-10 FT)
ANALYTE		
BENZO(A)ANTHRACENE	0.002	0.7 J
BENZO(B)FLUORANTHENE	0.002	1
BENZO(K)FLUORANTHENE	0.002	0.44 J
BENZO(A)PYRENE	ND	0.87 J
INDENO(1,2,3-CD)PYRENE	0.002	0.63 J

B-109 GW	STANDARD (ppb)	JAN 2013 (6-10 FT)
ANALYTE		
TOTAL CYANIDE	200	1300

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Updated MAY 14, 2018
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Legend

- MW-3 — MONITOR WELL (INSTALLED BY OTHERS)
- MW-101 — MONITORING WELL (INSTALLED BY STANTEC)
- MIP-2 — MIP GEOPROBE®
- SVP-6 — SUB-SLAB BORING (INSTALLED BY STANTEC)
- B-105 — SOIL BORING (INSTALLED BY GEI)
- SV-102/IAQ-102 — SUB-SLAB BORING, INDOOR AIR LOCATION (INSTALLED BY GEI)
- GP-4 — SOIL BORING (INSTALLED BY STANTEC)
- IAQ-1 / SV-1 — INDOOR AIR / SOIL GAS SAMPLE LOCATION
- HYDROGEN RELEASE COMPOUND (HRC) INJECTION AREA/POINTS – 2008
- ND — NOT DETECTED
- NA — NOT ANALYZED
- J — ESTIMATED CONCENTRATION
- PRE CIRCA 1954
- PRE CIRCA 1966
- PRE CIRCA 1980
- SITE BOUNDARIES

Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC. SEPTEMBER 2012.

DATA IN CHEM BOXES ARE ONLY FOR CHEMICALS ABOVE STANDARDS.

SEE SUPPLEMENTAL INVESTIGATION IMPLEMENTATION OF WORK PLAN REPORT OF MEMBRANE INTERFACE PROBE STUDY (MAY 2012) RESULTS FOR MIP RESULTS.

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

Figure No.
6

Title
CONTAMINANTS IN GROUNDWATER EXCEEDING GW QUALITY STANDARDS

Figure 7
Concentrations of PCE over Time
MW-4

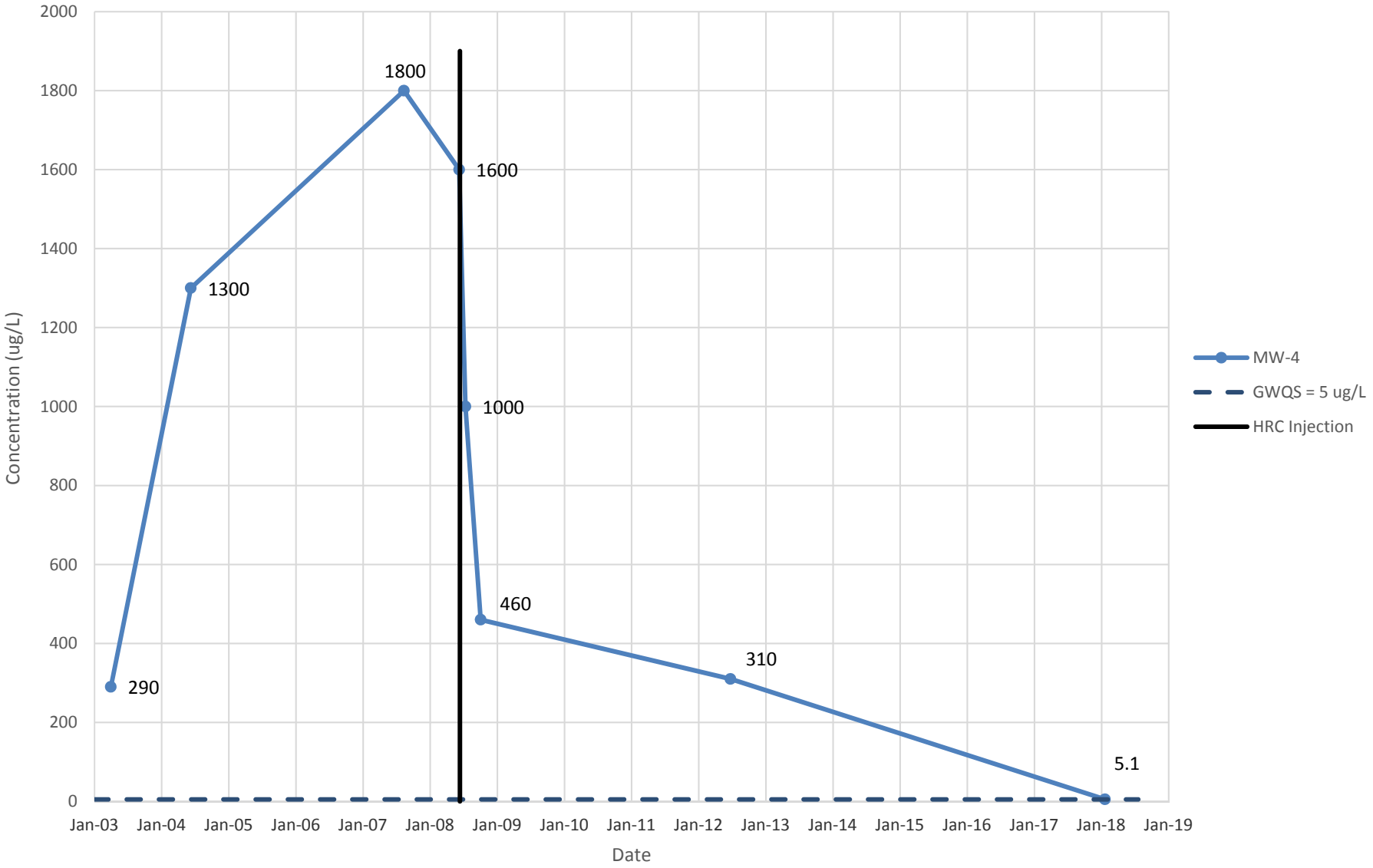
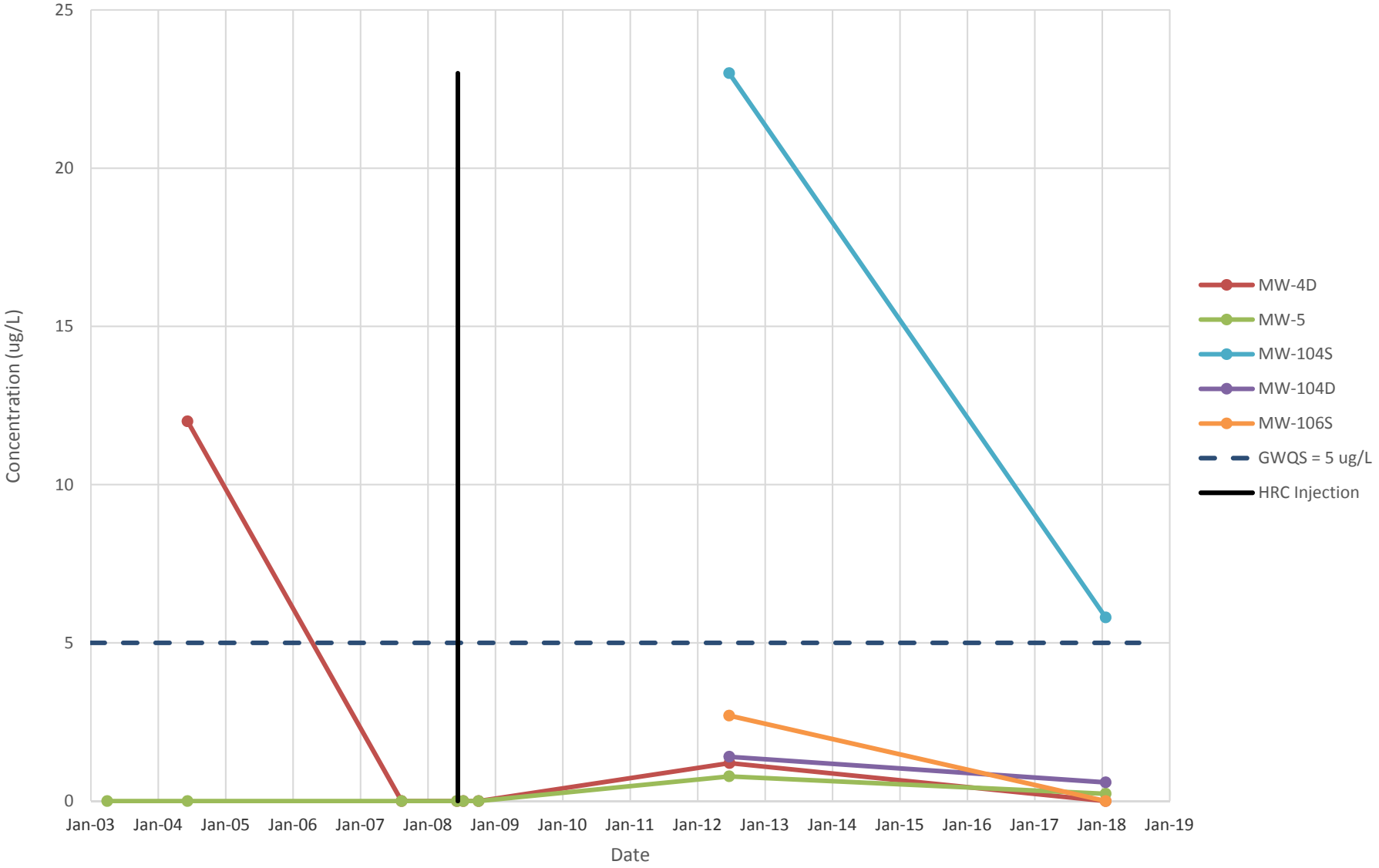


Figure 7A
Concentrations of PCE over Time
Select Monitoring Wells



LOCATION	CONCENTRATION (ug/m3)	ACTION CATEGORY
IAQ-1	310	
SV-1	3800	MITIGATE

SVP-9		
ANALYTE	STANDARD (ppb)	MAR 2012
ACENAPHTHENE	20	300
ANTHRACENE	50	84 J
BENZO(A)ANTHRACENE	0.002	44
BENZO(B)FLUORANTHENE	0.002	20
BENZO (K)FLUORANTHENE	0.002	8.2 J
BENZO(A)PYRENE	ND	27
CHRYSENE	0.002	52 J
DIPHENYL	5	86 J
FLUORENE	50	160
FLUORANTHENE	50	87 J
IDENO(1,2,3-cd)PYRENE	0.002	7.7 J
NAPHTHALENE	10	2100
PHANENTHRENE	50	30
PYRENE	50	160

LOCATION	CONCENTRATION (ug/m3)	ACTION CATEGORY
IAQ-1	310	
SV-2	14000	MITIGATE

LOCATION	CONCENTRATION (ug/m3)	ACTION CATEGORY
IA-103	1.57	
SV-103	115000	MITIGATE

LOCATION	CONCENTRATION (ug/m3)	ACTION CATEGORY
IA-101	0.515 J	
SV-101	433	NO FURTHER ACTION

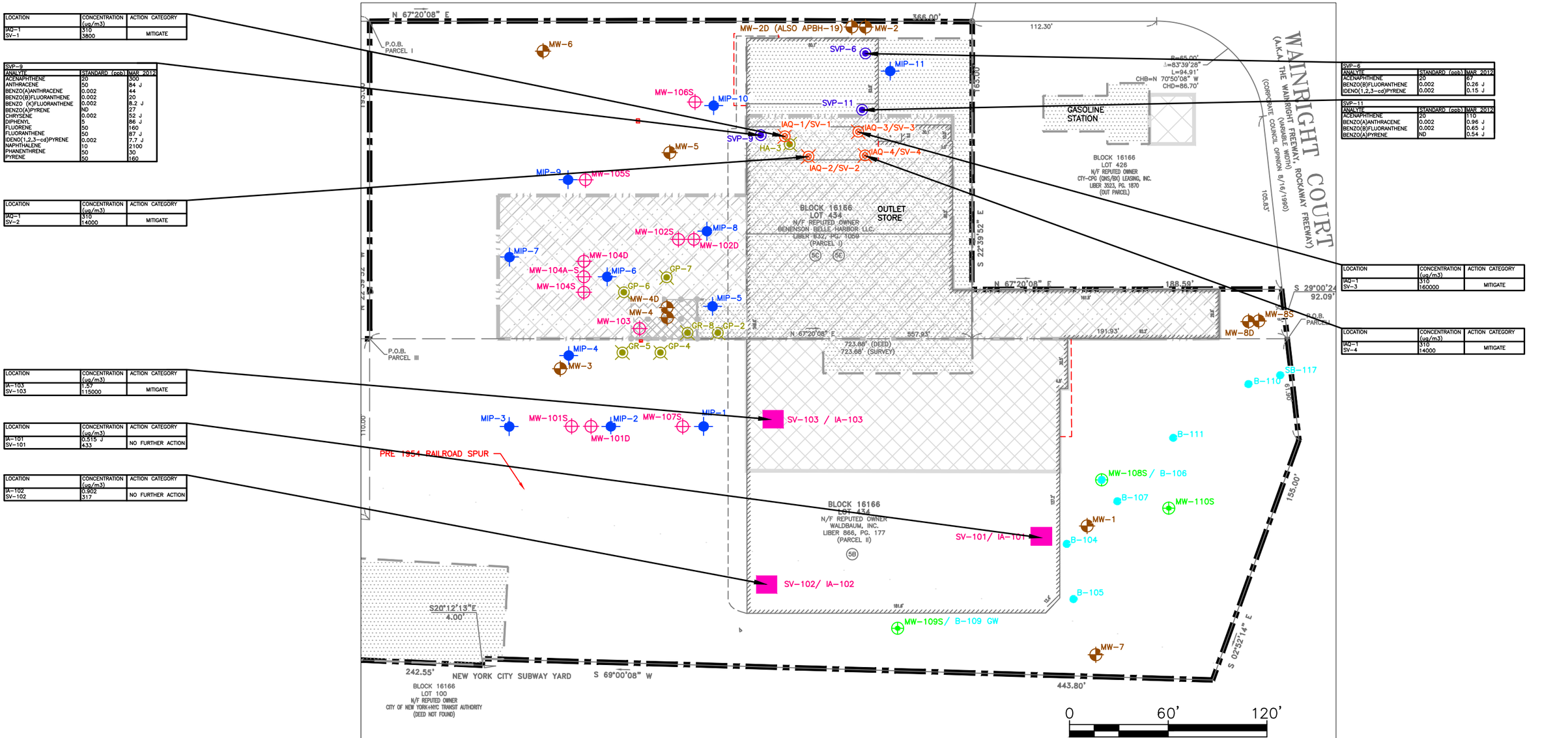
LOCATION	CONCENTRATION (ug/m3)	ACTION CATEGORY
IA-102	0.902	
SV-102	317	NO FURTHER ACTION

SVP-6		
ANALYTE	STANDARD (ppb)	MAR 2012
ACENAPHTHENE	20	67
BENZO(B)FLUORANTHENE	0.002	0.26 J
IDENO(1,2,3-cd)PYRENE	0.002	0.15 J

SVP-11		
ANALYTE	STANDARD (ppb)	MAR 2012
ACENAPHTHENE	20	110
BENZO(A)ANTHRACENE	0.002	0.96 J
BENZO(B)FLUORANTHENE	0.002	0.65 J
BENZO(A)PYRENE	ND	0.54 J

LOCATION	CONCENTRATION (ug/m3)	ACTION CATEGORY
IAQ-1	310	
SV-3	160000	MITIGATE

LOCATION	CONCENTRATION (ug/m3)	ACTION CATEGORY
IAQ-1	310	
SV-4	14000	MITIGATE



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Updated September 7, 2017
191711713

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Notes

SURVEY COMPLETED BY CONTROL POINT ASSOCIATES, INC. SEPTEMBER 2012.

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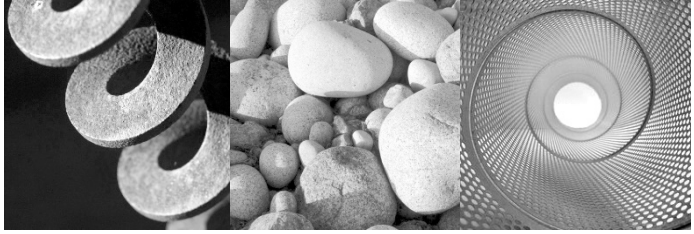
SEE APPENDIX D SUPPLEMENTAL INVESTIGATION IMPLEMENTATION OF WORK PLAN REPORT OF MEMBRANE INTERFACE PROBE STUDY RESULTS FOR MIP RESULTS.

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

Figure No.
8

Title
PCE IN INDOOR AIR / SOIL GAS ABOVE MITIGATION LEVELS

APPENDIX A



GEI Consultants

Consulting
Engineers and
Scientists

Interim Remedial Measure Work Plan

Belle Harbor Shopping Center

Rockaway Park, New York
Site ID # ~~V00490~~
NYSDEC Index No. ~~W2-0996-01-09~~

Submitted to:
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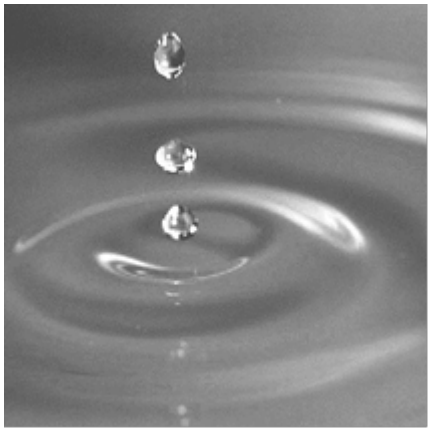
June 2018
Project 093150-2-1206



Matthew J. O'Neil, P.E.
Project Manager

Errol Kitt
Vice President

Professional Engineer Certification

I, Matthew J. O'Neil, certify that I am currently a NYS registered professional engineer and that this Remedial Action 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).

Date	Matthew J. O'Neil GEI Consultants, Inc., P.C. New York State Professional Engineer License Number 091317

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

Table of Contents

Figures

Appendices

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1. Background and Site Description

1.1 Purpose

GEI Consultants, Inc. P.C. (GEI), on behalf of National Grid, has prepared this Interim Remedial Measure (IRM) Work Plan for the removal of Manufactured Gas Plant (MGP)-related residuals at the Belle Harbor Shopping Center Site in Rockaway Park, Queens County, New York (the Site) in accordance with the New York State Department of Environmental Conservation (NYSDEC) voluntary cleanup program. The NYSDEC Site # is ~~V00490~~. This work will be completed in accordance with the access agreement between National Grid and the current site tenant the Stop & Shop Supermarket Company LLC (Stop & Shop). National Grid is proposing to remove shallow MGP-related residuals from the loading dock area in the eastern portion of the Site. The goal of this IRM is to remove the shallow MGP-related residuals observed from 0-3 feet below ground surface (ft bgs) during investigations completed in 2012 and 2015 at the property.

During investigations of the chlorinated Volatile Organic Compounds (VOCs) related to the former dry cleaner located on the Site, MGP-related residuals were detected. National Grid entered into an agreement with A&P to investigate the extent of MGP-related residuals at the Site. A summary of the observed impacts was submitted to the A&P's consultant Stantec Consulting Services, Inc. (Stantec) for inclusion in the Remedial Investigation Report for the site. A&P declared bankruptcy in 2015 and Stop & Shop acquired its leasehold interest in the Site through the bankruptcy proceedings. Stop & Shop was assigned A&P's leasehold interest in the property on November 5, 2015. Stop & Shop, as a successor to A&P, is preparing an application to move the Site from the Voluntary Cleanup Program to the Brownfield Remediation Program. This IRM will be conducted in accordance with the governing agreement at the time of the work.

1.2 Background and Description

The Site is approximately 5 acres in size located at 112-15 Beach Channel Drive, Rockaway Park, Queens County, New York (**Figure 1**). The Site currently consists of a shopping center building of approximately 57,000 square feet with tenant retail commercial operations (**Figure 2**). The remaining approximate 3.7 acres of the Site is paved. The Site is bordered by Beach Channel Drive running parallel to the northern boundary, a Mobil gasoline station adjacent to the north corner site boundary, and Wainwright Court/Rockaway Freeway to the east. An electrical substation and the former Rockaway Park MGP site is located immediately to the east of the Site across Wainwright Court/Rockaway Freeway. The New York City Subway Yard tracks are located to the south separated from the Site by a chain-linked fence. The Subway Yard appears to be at a lower elevation of approximately 2 to 3

feet below the grade of the Site parking area. A Post Office and retail stores are located to the northwest abutting the parking area of the Site. A New York City Department of Transportation (DOT) parking lot is located to the west (**Figure 2**).

The Site is relatively flat with a very gentle topographic downward slope toward the south. The Site is approximately 10 feet above mean sea level and within the Atlantic Coast Plain with 2 to 4 feet of fill beneath pavement and buildings. Jamaica Bay is approximately 300 feet north and the Atlantic Ocean is approximately 1,400 feet south of the Site.

Groundwater was encountered at the Site between 5 and 7 ft bgs during previous investigations at the Site. Groundwater measurements from these investigations indicate that groundwater flow in the shallow portion of the aquifer is to the north (Whitestone, 2004). A series of tidal studies were conducted from 2000 to 2009 on the adjacent Rockaway Park MGP site. The studies showed that during both high and low tide, shallow groundwater at the southern boundary of the Rockaway Park MGP Site flowed northeast and northwest toward Jamaica Bay. During periods of high tide, groundwater in the immediate vicinity of Beach Channel Drive flows to the south (GEI, 2009).

1.3 Previous Investigations

1.3.1 Phase II Investigation (Malcolm Pirnie, 2000-2001)

In two mobilizations to the Site, Malcolm Pirnie installed 38 soil borings both inside and outside of the former dry cleaner area. This included 12 borings in the vicinity of the loading dock area and south of the existing building. The full report of these investigations was not available for review. An excerpt of the report including the analytical results and some of the boring logs were included in the *Remedial Investigation Report & Supplemental Remedial Investigation & Corrective Action Work Plan* prepared by Whitestone Associates, Inc., (Whitestone, 2001). Figure 5 of that report indicated that "Free phase naphthalene plus other MGP waste products" were observed in boring APBH-31 located to the west of the building and the area adjacent to the loading dock. A boring log for this location was not included in the documents available for review. No other visual MGP-related residuals are noted in the figure or in the logs for borings APBHS-1 through APBHS-4, and APBH-7 through APBH-22. Boring logs for borings APBH-5, APBH-6, and APBH-23 through APBH-38 were not available for review. The report indicated that visual evidence including "smearing in the sample sleeve and strong odors of Semivolatile Organic Compound (SVOC) contamination" was observed in borings APBH-20 and APBH-21 at approximately 15 ft bgs. However, the boring logs at these locations did not identify any visual impacts. The only impact noted in either of the two boring logs was an elevated Photoionization Detector (PID) reading of 97.6 parts per millions (ppm) at 15 ft bgs in boring APBH-20.

Soil and groundwater analytical samples collected from the borings indicated the presence of Polycyclic Aromatic Hydrocarbons (PAHs) in the area adjacent to the loading dock consistent with MGP residuals.

1.3.2 Remedial Investigation (Whitestone, 2003)

During the remedial investigation of the chlorinated VOCs related to the former dry cleaner located on the Site, MGP-related residuals were detected. Specifically, elevated concentrations of PAHs were detected in soil collected from the boring installed at monitoring well MW-1 in the area adjacent to the loading dock. Although no visual impacts were noted during installation, MGP-related Dense Non-Aqueous Phase Liquid (DNAPL) was observed in monitoring well MW-1 during subsequent groundwater sampling and gauging.

1.3.3 DNAPL Forensics Investigation (National Grid, 2009)

NewFields Environmental Forensics Practice, LLC (NewFields) analyzed Non-Aqueous Phase Liquid (NAPL) samples from the Site and the former Rockaway Park MGP site. The purpose was to determine if the NAPL hydrocarbon signatures matched. Based on the analytical results, NewFields determined that all of the DNAPL consisted of carbureted water gas (CWG) tars; however, they exhibited distinct hydrocarbon fingerprints indicative of independent releases. The compositional differences were caused by the use of different gas oil feedstocks. In addition, the different degrees of weathering in the environment demonstrated the independent nature of the NAPL samples from each site.

1.3.4 Manufactured Gas Plant-Related Residuals Investigation Report (GEI, 2015)

GEI conducted an investigation of MGP-related residuals involving subsurface soil, groundwater, and soil vapor in the area near MW-1 in 2012, 2013, and 2015. A total of 42 samples at various depths were collected from 18 soil borings and analyzed for VOCs, SVOCs, Target Analyte List (TAL) metals and mercury, total cyanide, and free cyanide (**Figure 3**). Only seven of the 42 soil samples contained compounds (PAHs and total cyanide) which exceeded the Commercial Use Soil Cleanup Objectives (SCOs). Total cyanide was detected at each of the 18 boring locations, with the concentration from two soil samples near the former gas station and Wainwright Court (B-110 and B-117) exceeding the Commercial Use SCO. Free cyanide was detected in 19 out of 42 soil samples. Only two soil sample locations (B-110 and B-117) had free cyanide concentration more than 2 milligrams per kilogram.

Groundwater samples collected from temporary probes and monitoring wells showed detectable concentrations of MGP-related compounds above New York State Ambient Water Quality Standards.

Soil vapor, indoor air, and ambient air analytical data from collected samples did not contain elevated concentrations of MGP-related VOCs, and naphthalene was non-detect in all samples.

The 2012 and 2013 site work was originally submitted in a report entitled "Manufactured Gas Plant-Related Residuals Investigation Report, Belle Harbor Shopping Center" (October 2013) to Stantec. This report was included in Stantec's Draft Supplemental Remedial Investigation Report, which was submitted to NYSDEC in July 2014. Stantec received final comments from the NYSDEC regarding the MGP-related impacts via email on January 29, 2015. GEI prepared a work plan for additional delineation of MGP-related material in the vicinity of boring B-110 and soil vapor intrusion sampling for naphthalene. This work was incorporated into Stantec's Workplan dated April 1, 2015. NYSDEC subsequently approved the April 1, 2015 Workplan in a letter dated April 7, 2015. GEI conducted the vapor intrusion sampling on April 15, 2015 and the soil delineation sampling in June 2015. All data from 2012, 2013 and 2015 was included in the "Manufactured Gas Plant-Related Residuals Investigation Report, Belle Harbor Shopping Center" (September 2015) submitted to Stantec on September 9, 2015.

2. IRM Soil Removal

National Grid will complete an IRM to remove shallow soil impacts in the upper 3 feet of material in the loading dock area of the site. The planned limits of the IRM are depicted in **Figure 4**. The shallow MGP-related materials will be removed where present and accessible, and shipped for off-site disposal. Waste characterization and documentation sampling will be conducted prior to soil removal. The excavated material will be replaced with clean fill and a new asphalt entranceway surface. MGP-related material at depths greater than 3 feet bgs, which do not meet the Commercial Use SCOs (i.e., at B-110 and B-117) will be left in place below the new asphalt entranceway surface and institutional controls will be put in place to protect workers during any future subsurface construction activities. The horizontal extent of excavation will be bounded by MW-8D to the north, B-116 to the west, and B-118 to the south. The eastern boundary is based on the results of previous sampling during the Remedial Investigation for the adjacent Rockaway Park former MGP site. Specifically, the results of boring RPSB-74 located at the property boundary along Wainright Court. A data excerpt from this report is included in **Appendix A**.

GEI, acting as a representative for National Grid's Site Investigation and Remediation (SIR) group, will oversee National Grid's Remedial Contractor in managing MGP-related residuals. GEI will also perform community air monitoring and provide construction observation during all invasive activities. This will include perimeter monitoring in accordance with the Community Air Monitoring Plan (CAMP). All invasive activities which will encounter MGP-related residuals will be conducted in accordance with the Site Health and Safety Plan (HASP) included in **Appendix B**. Management of MGP-related residuals will be completed in accordance with this work plan.

This section of the Work Plan describes the following components of the IRM:

1. Remedy Execution
2. Mobilization and Site Access
3. Site Preparation
4. Documentation Sampling
5. IRM Excavation
6. Backfill
7. Material Handling
8. Site Restoration
9. Post Restoration Survey
10. Schedule

2.1 Remedy Execution

The proposed remedy includes the excavation, removal, and off-site disposal of MGP-related materials to a depth approximately 3 feet below the existing grade in the loading dock area. Impacted soils will be transported off-site for treatment and disposal at an appropriately permitted facility approved by National Grid. The excavation will be brought to final grade using certified-clean backfill. Asphalt pavement and entranceway will be sawcut at the limits of the work and will be restored to pre-construction conditions. The final grade of the site will be restored to match the existing grade.

It is anticipated that excavations will not extend below the water table and dewatering will not be required. Decontamination liquids generated will be containerized and stored within the project limits. The decontamination waste will be sampled for characterization for disposal by the Remediation Contractor at a National Grid approved disposal facility. If necessary, solids will be removed from the containers and combined with the impacted material being excavated and disposed of off-site.

Due to the limited volume of MGP-related material (240 cubic yards), a temporary structure will not be necessary to complete this excavation. A Vapor/Odor Management Plan is included in Section 3.

Site work will be limited to the hours in compliance with the Rules of New York City. Particularly, work hours will be restricted to start no earlier than 07:30 Monday through Friday with no heavy truck traffic until 08:00. All work must be completed and the site secured for the evening at 17:00 unless otherwise approved by National Grid and in compliance with the Rules of New York City, including after-hours work permits if applicable. Work hours may be adjusted with prior approval from National Grid, which will include input from the property owner/operator. Work between 18:00 and 07:00 will require a noise mitigation plan and authorization from the New York City Department of Buildings in accordance with the New York City Noise Ordinance.

Work will be scheduled to accommodate the operations of the shopping center. During working hours, National Grid's Remedial Contractor will make every effort to minimize potential nuisance community impacts. These include, but are not limited to, noise, odor, and traffic concerns associated with the execution of the remedy. Site work will not be conducted on weekends without prior approval of National Grid. The work will be completed so that truck traffic to the loading dock is not impeded during the work. This may include phasing the excavation or backfilling the excavation daily to provide truck access to the loading dock each night. National Grid's Remedial Contractor will schedule work and coordinate with National Grid and the Engineer, on behalf of the property owner/operator to accommodate their delivery schedule.

2.2 Mobilization and Site Access

Prior to mobilization, National Grid's Remedial Contractor will prepare and submit all required documents identified in the Contract Documents for review and approval by National Grid, National Grid's Engineer, and, as applicable, the NYSDEC. The Engineer will review National Grid's Remedial Contractor submittals to ensure conformance with Contract Documents.

National Grid's Remedial Contractor will apply for and obtain all necessary Federal, State, and local permits associated with completion of the work. These permits may include, but are not limited to, traffic routing, construction, air emissions, noise, etc.

Prior to the start of intrusive activities, National Grid's Remedial Contractor will perform utility clearance. National Grid's Remedial Contractor will contact New York 811 to request that all public utilities leading to the Site are located and marked. National Grid's Remedial Contractor will contract a private utility locator service to identify any utilities on the private property. This will include the use of Ground Penetrating Radar (GPR) at the perimeter of the excavation area. The locations of any known or suspected utilities will be hand cleared to confirm the utility location and alignment prior to the start of work. Any underground utility protection and/or relocation will be the responsibility of the National Grid's Remedial Contractor. This includes leaching basins for storm water drainage located immediate south of the proposed excavation area that will be protected during the work and electrical service to yard lights located adjacent to the work area. Any damage to underground utilities during the work will be repaired by National Grid's Remedial Contractor.

The Engineer will conduct a pre-construction site meeting, after the project is awarded, with National Grid's Remedial Contractor, National Grid, and NYSDEC prior to the commencement of IRM. The meeting will be conducted to review specified construction requirements and schedules, as well as to review the responsibilities of the National Grid's Remedial Contractor, the Engineer, and National Grid with respect to the IRM implementation.

Prior to the start of work, National Grid's Engineer will conduct an external pre-construction survey and inspection of adjacent properties to document existing conditions. The survey will be conducted under the oversight of the Engineer and the findings reviewed and approved by the Engineer and National Grid prior to mobilization.

A New York State-licensed surveyor will be utilized by the Remedial Contractor to establish a temporary baseline grid and benchmarks for the remedial work for use by the contractor to identify the extent of the excavation and maintain control of excavation limits and depths during the work.

The grid and benchmarks will be established in English Units (feet) in the following datums:

- Horizontal: New York State Plane Coordinate System; NAD83
- Vertical: North American Vertical Datum 1988, NAVD88

The surveyors will also establish other reference points, as needed, layout work, and survey record information such as the locations of samples and the limits of the excavations.

National Grid's Remedial Contractor will mobilize all necessary labor, equipment, supplies and materials to complete the IRM upon notice to proceed by National Grid.

The IRM excavation will occur at the current entrance of the Wainright Court to the rear lot of the shopping plaza. National Grid's Remedial Contractor will maintain access for contractor vehicles to utilize this entrance during the work. Customer access to and egress from, the shopping center to Wainright Court will not be possible during the work. It is anticipated that National Grid's Remedial Contractor will install temporary signage and a temporary barrier across both entrances to this area to prevent non-construction traffic flow into the work area as described in the Traffic Plan included in Section 9.

2.3 Site Preparation

National Grid's Remedial Contractor will be responsible for preparing the site for the remedy. Site preparation activities necessary to provide support for the work, includes at a minimum, the establishment of work zones, support facilities, decontamination facilities, erosion control measures, and installation of temporary security fencing around the work area and roll-off box staging area (for debris including non-impacted asphalt and concrete).

National Grid's Remedial Contractor will be responsible for removing/installing appropriate protection for existing structures/appurtenances prior to the start of the remedy.

National Grid's Remedial Contractor will be required to collect pre-characterization samples based on the requirements of the National Grid approved disposal facilities. National Grid's Remedial Contractor will be required to obtain approval from a primary and an alternate, properly-licensed, National Grid-approved disposal facility for all excavated material, prior to beginning any excavation work. Waste-characterization sampling is discussed further in Sections 7 and 8.

Soil erosion and sediment control measures will be installed prior to excavation and maintained throughout the project in accordance with the Erosion and Sediment Control Plan in the Contract Documents.

An 8-foot high temporary fence will be erected to enclose and control access to the construction site for the duration of the remedy. The site Security Plan, Section 5, indicates the location and installation details for the temporary fence.

As part of preparation of the Site, a decontamination/anti-traction pad will be constructed. The pad will likely be located towards the Site entrance to Wainright Court. The Decontamination Plan in Section 6 details the placement and operation of the decontamination/anti-traction pad.

2.4 Documentation Sampling

Prior to the start of excavation, National Grid's Engineer will collect documentation samples from the materials below the target depth of 3 ft bgs in the excavation areas from test holes using vacuum excavation or other hand clearing methods. The locations of the proposed documentation samples are depicted in **Figure 4**. Samples will be collected from the soils below the excavation limits.

Samples will be collected from both the 3-4 ft interval and the 4-5 ft interval. Confirmation samples will be analyzed for total cyanide and free cyanide via United States Environmental Protection Agency (EPA) Method 9012B and Method 9016, respectively. A rapid turn-around-time (less than 5 days) will be requested from the laboratory.

2.5 IRM Excavation

The shallow MGP-related residuals areas will be excavated to the target depth of 3 ft bgs. The depth may be increased based on the results of the documentation sampling to a maximum depth of 4 ft bgs to ensure that the remaining soils meet the Commercial Use SCO for cyanide. The planned soil excavation limits, as shown in **Figure 4,** are approximately 49 ft long by 44 ft wide to a depth of 3 ft bgs for a total of approximately 240 cubic yards of surface and subsurface material. The groundwater monitoring wells are screened from a depth of 5 ft bgs to a maximum depth of 40 ft bgs. Therefore, the lower excavation limits should be above the groundwater table and no dewatering measures are expected.

2.6 Backfill

A visual demarcation barrier consisting of a high-visibility woven geotextile will be placed at the base of the excavation. The excavation will be backfilled up to approximately 6 inches below grade with imported, well-graded sand and gravel from a DOT-approved source and then completed with asphalt to match the existing grade. The excavation will be backfilled with materials meeting the NYSDEC Part 375 Unrestricted Use Criteria. Backfill will be placed and compacted in lifts equal to or less than 1 foot in thickness.

2.7 Material Handling

Due to the constraints at the Site, it is anticipated that the excavation activities will be conducted as a direct load operation. All loading of excavated material will occur within the exclusion zone. All material transportation vehicles leaving the site must be watertight and will be decontaminated in accordance with the decontamination plan prior to departing the site. The watertight beds will be lined with plastic truck liners prior to material being placed in the bed. In the event that significant odors are noted, the material in the bed may be covered with Rusmar foam or similar odor suppressant prior to being covered in plastic. Finally, a solid tarp will be affixed to the truck bed to prevent volatilization or fugitive dust emissions during transit to the disposal facility. The truck will then exit the excavation area and proceed immediately to a decontamination pad. Following decontamination, the truck will proceed directly to the designated approved disposal facility.

Based on the investigation data, it is anticipated that excavated material will be transported as non-hazardous material. Waste characterization will be completed prior to the start of excavation. If necessary, materials encountered during excavation that may exhibit hazardous characteristics will be segregated, stored on site, characterized via analytical sampling, and disposed of appropriately by National Grid's Remedial Contractor.

2.8 Site Restoration

Upon completion of the remedy, the Site will be restored to a paved entranceway. Restoration actions shall include, but may not be limited to:

- Backfill and compact the fill in the excavation area
- Removal of all erosion control measures after permanent stabilization
- Paving the site to match existing site grade
- Replacing any removed or damaged structures, utilities or appurtenances, if damaged during the IRM
- Restoration of the asphalt surface, entranceways, curb and sidewalk wherever they were removed or damaged
- Post Restoration survey to document conditions following restoration

2.9 Post Restoration Survey

A survey of the final surface and any sample points will be conducted at the end of the remedial action and compared to prior surveys to ensure that the excavated areas have been properly backfilled and paved to match the grade of the existing surface.

2.10 Schedule

Work will commence following approval of this Work Plan based on the availability of National Grid's Remedial Contractor and access from the property owner. Work will be conducted to minimize the impacts on the property owner during the work.

Remedial Activity	Approximate Duration
Waste Characterization/Documentation Sampling	2 Days
Site Mobilization/Demobilization	1 week
Shallow Soil Excavation	1-2 weeks
Site Restoration	1 week

3. DNAPL Recovery Evaluation

National Grid will complete an evaluation of DNAPL recovery at monitoring well MW-1 to evaluate potential source material removal options for the DNAPL that is present at this location. This evaluation will include an assessment of the DNAPL's mobility and hydraulic recoverability. Determination of the mobility of the DNAPL will determine the frequency of DNAPL recovery operations warranted.

Prior to testing, GEI will evaluate the well conditions in MW-1 to verify suitability for testing. This preliminary testing will include fluid gauging events to collect depth to water, depth to DNAPL, and well total depth data using an interface probe. This data will be utilized to verify there is sufficient DNAPL thickness to test, that the well total depth has not been compromised, and establish the pre-test equilibrium condition. GEI will also collect a DNAPL sample and have it analyzed in an environmental laboratory for density and viscosity.

If the well is determined to be suitable for testing, GEI will conduct a baildown test of the DNAPL present in MW-1. DNAPL is removed from the well and filterpack to initiate the test. The fluid levels are monitored via pressure transducers as well as periodic manual gauging until the DNAPL thickness returns to the pre-testing equilibrium in the well. If the DNAPL present is highly transmissive, the testing may be complete within hours. However, if the DNAPL is at or below the threshold of hydraulic recoverability, the test may take weeks to months to have the DNAPL thickness within the well return to the pre-testing equilibrium condition. The data generated from the transducers will be used to identify the specific elevations and thickness of the Mobile NAPL Intervals (MNIs) in the formation that may support future recovery as well as their DNAPL transmissivity.

Identification of the MNIs is critical because the well acts as a sump and DNAPL enters the well from all MNIs simultaneously causing an exaggeration of the DNAPL thickness relative to where the DNAPL is actually present within the formation; thus, exaggerating the height of DNAPL in the well versus the impacted portion of the formation.

Transmissivity is an established, universal metric for the recoverability of groundwater from aquifers, essentially measuring the rate at which groundwater can flow through a one-foot wide strip of an aquifer under a unit gradient in a unit amount of time. However, transmissivity is not limited to groundwater. It can be used to measure the flow potential for any liquid in the subsurface that exhibits Darcian flow. As documented in ASTM E2856, transmissivity may be measured for LNAPL via multiple methods, and accounts for the different density and viscosity of the LNAPL, as well as the relative permeability resulting from two liquids (groundwater and LNAPL) competing to flow through an aquifer. Transmissivity may also be calculated for DNAPL using a modification of the methods

identified in ASTM E2856. Using this method and analysis of the data, the DNAPL can be quantitatively identified as mobile or immobile DNAPL, and identify if these mobile NAPL intervals require or will support active hydraulic recovery.

Following completion of the evaluation, the results will be presented to the NYSDEC along with a recommendation regarding the frequency of DNAPL recovery operations warranted at the Site. The DNAPL present at the Site is a potential source of groundwater impacts at the site and the removal of the DNAPL will likely decrease the dissolved phase contribution to groundwater quality at the Site.

4. Vapor/Odor Management

Excavation activities at remediation sites can generate airborne dust and vapors (VOCs) that have the potential to migrate off site. In recognition of this potential hazard, the New York State Department of Health (NYSDOH) has promulgated a CAMP that establishes action levels for respirable dust and VOCs that are protective of the surrounding community. The requirements of the CAMP are contained in Appendix 1A of the 2010 Draft DER-10 Technical Guidance for the site Investigations and Remediation. The CAMP is intended to supplement, but be discrete from the air-monitoring program implemented by National Grid's Remedial Contractor for purposes of evaluating site worker health and safety.

4.1 Community Air Monitoring

A site-specific CAMP has been prepared for the Site and included in **Appendix C**. During times of ground intrusive activities, fixed air monitoring stations will be placed upwind and downwind of the work area. VOCs and respirable particulates (PM-10) will be monitored at the upwind and downwind stations on a continuous basis. The CAMP is designed to provide monitoring procedures, Alert Limits, Action Limits, and contingency measures if Action Limits are approached. An Alert Limit is a contaminant concentration or odor intensity that triggers contingent measures. An Alert Limit does not suggest the existence of a health hazard, but serves instead as a screening tool to trigger contingent measures if necessary, to assist in minimizing off-site transport of contaminants and odors during remedial activities. An Action Limit is a contaminant concentration or odor intensity that triggers the Contingency Plan.

The CAMP includes a Contingency Plan that defines specific response activities to be implemented during working hours if an exceedance of an Alert Limit or Action Limit for a measured compound occurs. The response actions, potentially including work stoppage, are intended to prevent or significantly reduce the migration of airborne contaminants from the Site.

If the real-time perimeter Alert Limits are exceeded or significant nuisance odors are noted, National Grid, the Engineer, and National Grid's Remedial Contractor will consult to determine what type of emission control action is appropriate. Actions will be taken at the Alert Limit in an attempt to prevent exceedance of the Action Limit and implementation of more stringent Contingency Plan response activities. Actions that may be taken to reduce emissions include the following:

- Spraying water on exposed soil surfaces and/or roadways to suppress windblown dust.

- Covering working areas of exposed impacted soils, trucks loaded with impacted soils, or stockpiles of impacted soils with tarpaulins with vapor suppressing foam or other vapor control agent.
- Temporarily relocating work to an area with potentially lower emission levels.
- Reduce the production rate or change the sequence of work activities.
- Change the work methods or equipment to alternatives that minimize air emissions.

In practice, these actions will typically be employed proactively to prevent action levels from being reached at the exclusion zone perimeter in the first instance.

4.2 Fugitive Dust Control

Construction activities will be performed so as to limit the potential for fugitive dust emissions. Dust control measures will be implemented to minimize the potential for dust generation during soil excavation and handling, and placement of fill. Dust control measures will include a water mist spray, a slowdown of the work activities, and/or suppressant foams. National Grid's Remedial Contractor will provide materials to act as a dust suppressant. This may include tarps and/or water, or chemical foam (e.g., Rusmar^{TM} foam) or other National Grid-approved method.

National Grid's Remedial Contractor will keep sufficient dust suppressant materials on site to suppress fugitive dust from the excavation. The material will be stored near the excavation and will be easily accessible.

The exclusion and support zones will be wet down to minimize dust emissions as necessary. Truck routes will be continuously monitored for excessive dirt or dust. Proper cleaning of trucks exiting the exclusion zone will aid in minimizing/ eliminating dusty conditions on site. A decontamination pad large enough to accommodate equipment and truck traffic will be constructed at exit points to clean tires of transport trucks exiting the Site.

Truck routes within the exclusion zone will be inspected continuously during truck traffic periods for excessive dirt or dust. Proper cleaning of trucks exiting the exclusion zone will minimize transferring dust to the adjacent roadways. Transport trucks exiting the exclusion zone will pass through an inspection area and/or to inspect tires and undercarriages for excess dust and that tarps are secured. Excessive mud and loose dirt observed on the trucks will be manually removed with brooms and brushes as necessary.

5. Erosion and Sediment Control Plan

The erosion and sediment controls are intended to mitigate erosion and sedimentation from the Site.

5.1 Description of Construction Activities

This project involves the excavation of approximately 240 cubic yards of MGP-related source material. Excavation depths will be approximately 3 feet bgs. All storm water runoff from the protected perimeter of the exclusion zone will be routed into the local drainage structures prior to contact with impacted materials for the remediation work. Access areas between the excavation area and the adjacent public streets will contain decontamination stations for all trucks and equipment. The decontamination waters will be collected and stored on site in a frac tank.

5.2 Potential Areas for Erosion and Sedimentation

The site is relatively flat, but slopes slightly from East to West across the remediation area. The IRM area is primarily paved with southern portions of the site covered by gravel. Trucks/equipment exiting the excavation area could track soils onto the traveled areas. Adjacent storm drains could be impacted by construction activities during the work.

5.3 Implementation of Erosion Control Measures

Hay bales will be installed around the entire perimeter of the areas to be excavated. Decontamination stations will act as anti-tracking pads, thereby, removing soil and sediment from all trucks/equipment wheels and bodies before exiting the Site onto public streets. Adjacent storm drains will be protected during construction activities to prevent sediment entering the drains. All trucks shall have watertight compartments to prevent seepage from wet soil from leaking onto public streets.

National Grid's Remedial Contractor shall install and maintain the erosion control measures for the duration of the excavation work. Additional erosion control measures may be needed due to unforeseen conditions. The National Grid's Remedial Contractor shall install additional measures as necessary and as directed by National Grid.

5.4 Restoration

Upon completion of the remedy, National Grid's Remedial Contractor will remove all hay bales and restore the surface to pre-construction conditions. All sediment accumulated in the

hay bales will be removed and transported to a licensed, National Grid-approved disposal facility.

6. Site Security Plan

The objectives of the site security plan at the site are to prevent the vandalism/destruction of construction equipment and to prevent access and minimize health and safety concerns for the patrons of the shopping center.

6.1 Perimeter Security

A temporary fence will be erected around the perimeter of the work area. At a minimum, the fence will be 8-foot high, equipped with a privacy screen. The fence will extend around all work areas to include the excavation area, waste handling equipment, and storage areas, if any. The fence will have two gates that will have the ability to be locked at the end of each working day. If not otherwise lighted (i.e. building floodlights, municipal streetlights, etc.), National Grid's Remedial Contractor will provide temporary lighting at the gate. Additional lighting and traffic controls will be placed at the entrance to Wainright Court as described in Section 10, Traffic Control Plan.

6.2 Equipment Security

All vehicles and/or equipment left in the work area must be secured at the end of each working day. Vehicles and equipment must remain inside the perimeter fence, or decontaminated and moved to a remote secured area, if left on site overnight or during non-work days. No vehicles or equipment may be left overnight in an unsecured location. It is the responsibility of National Grid's Remedial Contractor to ensure that all non-essential equipment is de-energized when left on-site and not in use to prevent electrical/fire/explosive hazards. No equipment will run overnight and/or on non-working days.

7. Decontamination Plan

The objectives of the decontamination plan at the Site are to provide the procedures and equipment necessary to decontaminate personnel and equipment to prevent cross-contamination from the excavation area to public areas (i.e., highways, roads, support trailer, vehicles, etc.) This plan does not replace the decontamination procedures outlined in the HASP, Appendix B. This plan provides additional guidelines on decontamination locations, necessary equipment, and procedures.

Primarily, the Site will be divided into three primary zones: the exclusion zone (EZ), the contamination reduction zone (CRZ), and the onsite staging area/support zone (SZ) during the implementation of remedial activities. These locations are detailed in the National Grid's Remedial Contractor Submittal and will be further defined in the field based on work activities being conducted in an individual area as well as the results of air monitoring activities.

7.1 Decontamination Procedures

National Grid's Remedial Contractor will establish decontamination areas for the following activities.

- Personnel decontamination
- Equipment decontamination

7.1.1 Personnel Decontamination Station

Personnel field decontamination/cleanup will take place at the exit of the established EZs in CRZs. If possible, these field decontamination facilities will be located upwind of the EZs.

Once removed, disposable personal protective equipment (PPE) will be collected at the field decontamination site of the CRZ in a drum or large plastic bag. The drum or plastic bag will be secured. Additional details for personnel decontamination are presented in the HASP contained in **Appendix B**.

The designated personnel field decontamination area will be equipped with basins for clean wash water and detergent, and trash bags or cans for containing disposable PPE and discarded materials. Once personnel have decontaminated at this station and taken off their PPE, they will proceed to a field sink or basins where they will wash themselves as a secondary means of personal hygiene (e.g., hands, face, etc.). All water will be containerized and transferred to the on-site storage for decontamination liquids.

The specific decontamination procedures and requirements for the disposal of decontamination wastewater are outlined in the HASP, Appendix B.

7.1.2 Equipment Decontamination Station

Equipment decontamination will take place on a decontamination pad that will be constructed, at a minimum, as a plastic lined and bermed area, with a wastewater collection sump. Decontamination activities shall include the removal of contaminated soil, debris and other miscellaneous materials from all construction equipment and tools utilized within the EZ using a high-pressure, low volume cleaner. In addition, hand tools will be used to physically remove soil during winter months to prevent freezing and icy conditions.

All equipment in contact with soils or remediation wastewater leaving the site will be decontaminated per these guidelines. In addition, any equipment utilized to excavate impacted material will be decontaminated prior to use in backfilling (e.g. excavator bucket).

The decontamination pad will be constructed to adequately facilitate decontamination of the largest mobile construction equipment and to withstand the anticipated traffic loads throughout the duration of the project. The decontamination pad will be located and constructed as detailed in a submittal from National Grid's Remedial Contractor. Provisions will be made to control overspray at the decontamination pad(s).

Hand-held drilling equipment, hand tools, and miscellaneous small equipment that come in contact with excavated soils or impacted groundwater will be decontaminated on the decontamination pad in buckets of water and detergent.

Wastewater from equipment decontamination will be containerized. Disposal of the wastewater will be handled in accordance with the Waste Management Plan (Section 8).

Soils collected from the decontamination pads will be bulked with the excavated material and sent to the licensed National Grid-approved disposal facility.

7.1.3 Material Transport Vehicle Decontamination

Trucks transporting soil off-site will enter the excavation area as described in the Traffic Control Plan (Section 10). Care will be exercised when loading trucks so as not to spill material on the outside of the trucks. Upon exiting the EZ, National Grid's Remedial Contractor will stage the trucks on the equipment decontamination/anti-traction pad. Trucks will then be visually inspected (i.e., box sidewalls, box tailgate, and tires, etc.), cleaned with brushes/brooms and will be decontaminated with pressure sprayers, if necessary, prior to being allowed to leave the site.

In addition, trucks will be required to be covered with solid plastic tarp prior to departing the EZ.

7.2 Decontamination Equipment

National Grid's Remedial Contractor will be responsible for maintaining a sufficient supply of materials/equipment required to implement decontamination procedures, including, but not limited to, the following items:

- Plastic trash barrels
- Liners for trash barrels
- Wash basins
- Alconox™ detergent concentrate
- Hand pump sprayers
- Long handled soft bristle brushes
- Large sponges
- Cleaning wipes for respirators, if necessary
- Bench or stool(s)
- Stepladder(s)
- Pressure washer
- Liquid detergent and paper towels
- Plastic trash bags
- Supplies/equipment to construct the decontamination pads
- All necessary hosing, connections, etc., to collect and transport decontamination fluids to the wastewater storage unit

8. Waste Management Plan

The objective of the waste management plan at the site is to provide the National Grid's Remedial Contractor guidelines for managing each waste stream. National Grid's Remedial Contractor will dispose of all waste materials generated as a result of the remedial activities in accordance with all applicable laws and regulations at a National Grid-approved disposal facility. National Grid will prepare and submit to the treatment/disposal facility a generator profile of soils and wastes generated at the site.

8.1 Disposal Record Keeping

All manifests and/or bills of lading for all shipments will be submitted to the Engineer prior to any vehicle departing the site. The manifest form and/or bills of lading will be signed by an approved agent for National Grid and the truck driver before the material leaves the Site; and by a representative of disposal facility when the load is received. A copy of the signed Manifest will be maintained on file in the National Grid's Remedial Contractor's administrative trailer by the Engineer (GEI). Upon arrival at the disposal facility, the Manifest will be signed and a copy returned to the Engineer, complete with all applicable signatures as proof of delivery. A weight ticket from the receiving facility will be submitted with each manifest to the Engineer. The returned manifests will be cross checked and matched with the original copy of the manifest already on file.

A log of all shipments and copies of all manifests and/or bills of lading will be maintained by the Engineer on-site for reference. Upon completion of the remedy, National Grid will receive all logs and manifests and/or bills of lading. The logs, manifests, and bills of lading will be included in the IRM Completion Report following completion of the work to create a permanent record of disposal.

8.2 Material Shipping Procedures

Waste transporters, properly permitted by the NYSDEC, will be utilized to ship the impacted soils to approved disposal facilities. National Grid's Remedial Contractor will manage all disposal documentation including, but not limited to, all necessary manifests, bill-of-ladings, weight tickets, and certificates of treatment/destruction.

National Grid's Remedial Contractor will coordinate with the transport and disposal facilities to schedule an appropriate amount of transport trucks and to schedule deliveries of materials to the disposal facilities. Coordination with the disposal and transport facilities will be critical to accommodate the sequence of proposed excavation activities. To eliminate the need for staging of trucks on local roadways, trucks will be scheduled in a manner that will minimize the amount of trucks waiting to be loaded.

Trucks that are waiting to be loaded will be directed to the on-site staging area, or the SZ as detailed in the National Grid's Remedial Contractor Submittal. Staging of trucks will be limited to the areas identified by the property owner/operator to minimize interference with the active site operations.

Upon entry to the Site via Wainright Court, the trucks will be inspected to ensure the proper placards, decals and permits are available. While on–site, transport trucks will remain on designated haul routes. All loaded trucks leaving the EZ will follow the Decontamination Plan. Transport trucks will utilize the most direct hauling route between the Site and the disposal facility as described in Section 9. National Grid's Remedial Contractor will ensure that all trucks are loaded such that the total weight of the truck meets the requirements of the New York City Bridge Authority limits.

All material transportation vehicles leaving the site must be watertight and will be decontaminated in accordance with the decontamination plan prior to departing the site. The watertight beds will be lined with plastic truck liners prior to material being placed in the bed. In the event that significant odors are noted, the material in the bed may be covered with Rusmar foam or similar odor suppressant prior to being covered in plastic. Finally, a solid tarp will be affixed to the truck bed to prevent volatilization or fugitive dust emissions during transit to the disposal facility. In the event that a truck arrives at the site without a solid tarp, the plastic bed liner will be folded over the soil in the truck bed, secured, and the mesh tarp on the truck will be used to cover bed liner.

All material transportation vehicles leaving the Site will be decontaminated in accordance with the Decontamination Plan prior to departing the EZ.

Individual waste streams will be handled as follows.

8.2.1 Impacted Soils and Construction and Demolition Waste

All excavated MGP-related material will be placed directly into haul vehicles and transported directly to an appropriately-licensed, National Grid-approved disposal facility. National Grid's Remedial Contractor will have a primary and an alternate receiving facility prepared to receive the impacted soils prior to excavation.

Impacted soils that contain too high a water content to be transported safely (e.g. without risk of a liquid spill off-site) must be amended on site within the excavation area, by the National Grid's Remedial Contractor prior to shipment off-site. All amendments used at the site will meet NYSDEC requirements.

Impacted construction and demolition (C&D) waste (i.e., concrete, debris, etc.) will be separated from source material upon excavation, and transported for treatment/disposal at a National Grid-approved Construction and Demolition Processing facility.

8.2.2 Uncontaminated C&D Waste

Uncontaminated C&D waste (i.e., asphalt pavement sections, concrete, and debris) will be separated, if possible, from impacted soil upon excavation, immediately placed in a roll-off container or temporarily placed on the site for future loading, and transported for disposal as construction debris at an approved facility/landfill.

8.2.3 Decontamination Water

Contaminated liquids from decontamination of equipment and personnel will be pumped into the dewatering frac tank(s) and disposed of off-site. National Grid's Remedial Contractor will be responsible for conducting waste characterization of the liquids in the frac tank prior to removal form the site. The waste characterization sampling will be in compliance with the requirements of the specific National Grid-approved facility that will accept the liquid wastes. National Grid's Remedial Contractor will retain a licensed liquid waste hauler to haul liquid to the approved disposal facility. National Grid's Remedial Contractor will be responsible for obtaining any appropriate Federal, State, and/or local permits that may be required.

It is not anticipated that impacted groundwater will be collected during this remedy. However, in the event that impacted groundwater is collected, it will be containerized for off-site disposal.

Solid material collected in the frac tank(s), as a result of settling with the tank(s), will be bulked with the MGP-related material and sent to an appropriately-licensed, National Grid-approved disposal facility as necessary.

8.3 Soil Disposal Characterization Analyses

Samples collected from MGP-impacted materials for disposal will be analyzed in accordance with the receiving facilities' guidelines and all Local, State and Federal laws.

It is not anticipated that any wastes generated as a result of remedial activities will be transported as hazardous waste. All materials will be transported as non-hazardous material to a thermal desorption facility.

The Engineer will be responsible for collecting and analyzing disposal samples as required for acceptance by the National Grid-approved receiving facility. National Grid's Remedial Contractor will provide the Engineer the selected receiving facilities' guidelines prior to sampling. The number, location, and specific analytical criteria of in-situ waste characterization samples required will be dependent on the selected facilities requirements. National Grid's Remedial Contractor shall utilize these results to select appropriate and acceptable primary and backup appropriately-licensed, National Grid-approved disposal

facilities. If the selected facility or facilities require additional disposal characterization data, it is the responsibility of National Grid's Remedial Contractor to coordinate with National Grid and obtain the appropriate samples prior to the start of excavation activities. National Grid's Remedial Contractor shall provide the Engineer the results of all analyses immediately upon receipt.

9. Sample Collection & Analysis Plan

The documentation sample collection and analysis plan for the site has been designed to support the requirements of the remedy. The remedy includes the removal of MGP-related source material. This plan describes the sampling and analysis procedures for collecting representative samples of backfill and waste water for disposal.

Material within the excavation limits will be removed and the excavation will be backfilled with clean fill. Documentation sampling is not anticipated for the material below 5 feet bgs. Previous sampling from the investigations have already identified the magnitude of the remaining impacts below 5 feet bgs.

All analytical testing will be performed by a laboratory that holds a current NYSDOH Environmental Laboratory-Approval Program certification. A copy of the documentation sampling data will be maintained at the Engineer's trailer during the remedial activities.

The excavation will be backfilled with imported materials. National Grid's Remedial Contractor will identify the DOT-approved borrow pit location(s) of imported material prior to the start of excavation activities. National Grid's Remedial Contractor will provide certificates of clean fill for the imported material identifying said material as native. In addition, National Grid's Remedial Contractor will provide analytical results from the borrow pit(s), specific to the actual fill being imported to the site, as confirmation that the material is free of contamination. The results of the borrow source evaluation including analytical results will be provided to the NYSDEC with a Request to Import/Reuse Fill or Soil form prior to importing fill to the site.

At a minimum, a sample of the backfill will be collected at the beginning, the middle, and the end of backfill operations for quality control purposes. Backfill samples will be analyzed for Resource Conservation and Recovery Act (RCRA) 8 Metals, polychlorinated biphenyls (PCBs) by EPA Method 8082, VOCs by EPA Method 8260 or New York State Analytical Service Protocol (NYSASP) Method 95.1, and SVOCs by EPA Method 8270C or NYSASP Method 95-2. The results of these analysis will be submitted in the IRM Completion Report.

10. Traffic Control Plan

The objectives of the traffic plan at the site are to describe the traffic objectives and concerns. The Traffic Control Plan indicates the traffic routes to and from the site for:

- Trucking soil and C&D waste off-site
- Importing clean fill to the site
- Liquid waste hauler off-loading decontamination liquids
- Contractor access and parking
- Equipment access and storage

Vehicles for hauling of contaminated soil, fill materials, and supplies shall enter the site from Wainright Court.

Vehicles will use New York City DOT (NYCDOT)-approved truck routes to the access the site and transport materials. The nearest Through Truck Route to the Site is Beach Channel Drive. The proposed traffic routing pattern to the site from Beach Channel Drive is presented below:

- Vehicles shall access the site by turning onto Wainright Court from Beach Channel Drive and making a right turn through the primary ingress/egress gates on Wainright Court to access the site.
- Vehicles transporting impacted materials exiting the property will exit via the same gate and make a right turn onto Wainright Court.
- Vehicles will make a left turn onto Beach 108th Street.
- Vehicles will then make a left turn onto Beach Channel Drive.
- Vehicles will then proceed to their destination using the NYCDOT-approve truck routes. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. These are the most appropriate routes and take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

National Grid's Remedial Contractor shall provide traffic control personnel when all trucks are entering and exiting the site onto Wainright Court. Traffic control personnel shall also direct traffic as needed upon delivery of equipment, trailers, excavation support materials, etc.

National Grid's Remedial Contractor shall provide a detailed traffic route for all vehicles transporting waste materials to the specific disposal facilities.

National Grid's Remedial Contractor will install construction warning signs and traffic barriers to prevent traffic from passing around the south side of the grocery store towards Wainright Court. Only emergency vehicles and delivery trucks for the grocery store will be allowed access through the south side of the grocery store.

Shallow soil excavation and backfill may be conducted in phases to enhance cooperation between the remedial construction activities and the grocery store delivery trucks.

The traffic plan will be reviewed and approved by the property owner prior to the start of work.

National Grid's Remedial Contractor will maintain all signage and traffic controls required for the completion of the project.

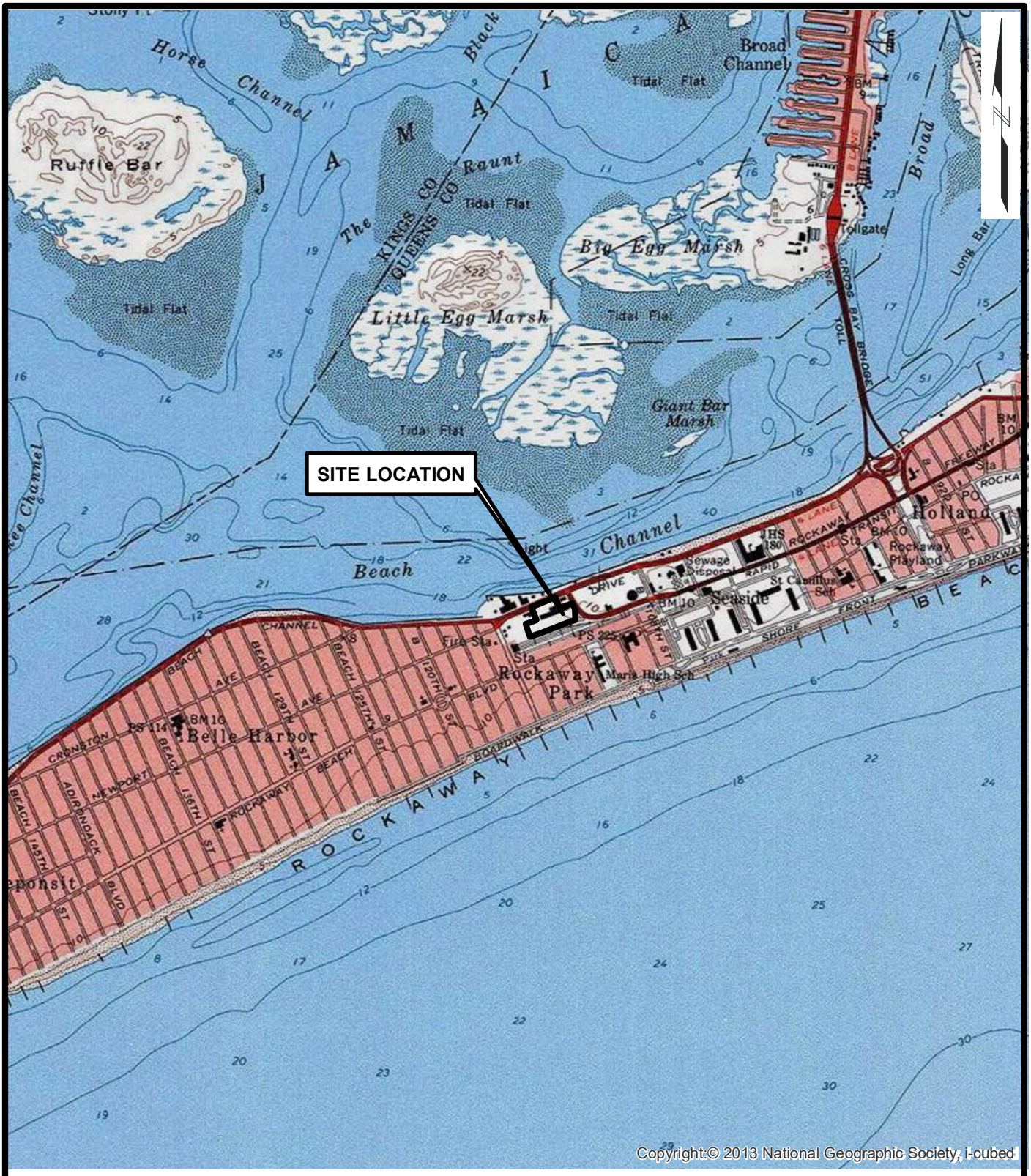
11. Reporting

Following the completion of work, a IRM Completion Report will be developed to document the excavation activities. This documentation will include a summary of the field program, documentation of any changes to the Work Plan scope, documentation of the final disposal of solid and hazardous waste.

Specific components of the IRM Completion Report will include:

- Waste Characterization and pre-excavation soil sampling analytical results
- The actual volumes of excavated material
- The results of documentation analyses
- Other plans and figures (if required), photographs, data summary tables, and appendices that will provide National Grid with an accurate account of the remedial measures implemented at the Site
- Summary of construction work, meetings, and changes in work scope
- Shipping manifests and bills of lading (contaminated soil, clean fill, and construction dewatering/decontamination liquids)
- Summary of Air Monitoring Data collected during the remedial activities.
- Certification that material transported off-site was disposed of at a properly-licensed, National Grid-approved disposal or treatment facility
- "As-Built" survey drawings documenting the final site conditions prepared by a New York State-licensed land surveyor

Figures



SOURCE:
USGS TOPOGRAPHIC MAP, ACCESSED VIA WWW.ARCGISONLINE.COM

0 1,000 2,000 4,000

SCALE: 1" = 2000'

IRM Work Plan
Belle Harbor Shopping Center
Rockaway Park, New York

nationalgrid

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SITE LOCATION MAP

Project 093150 | June 2018 | Fig. 1

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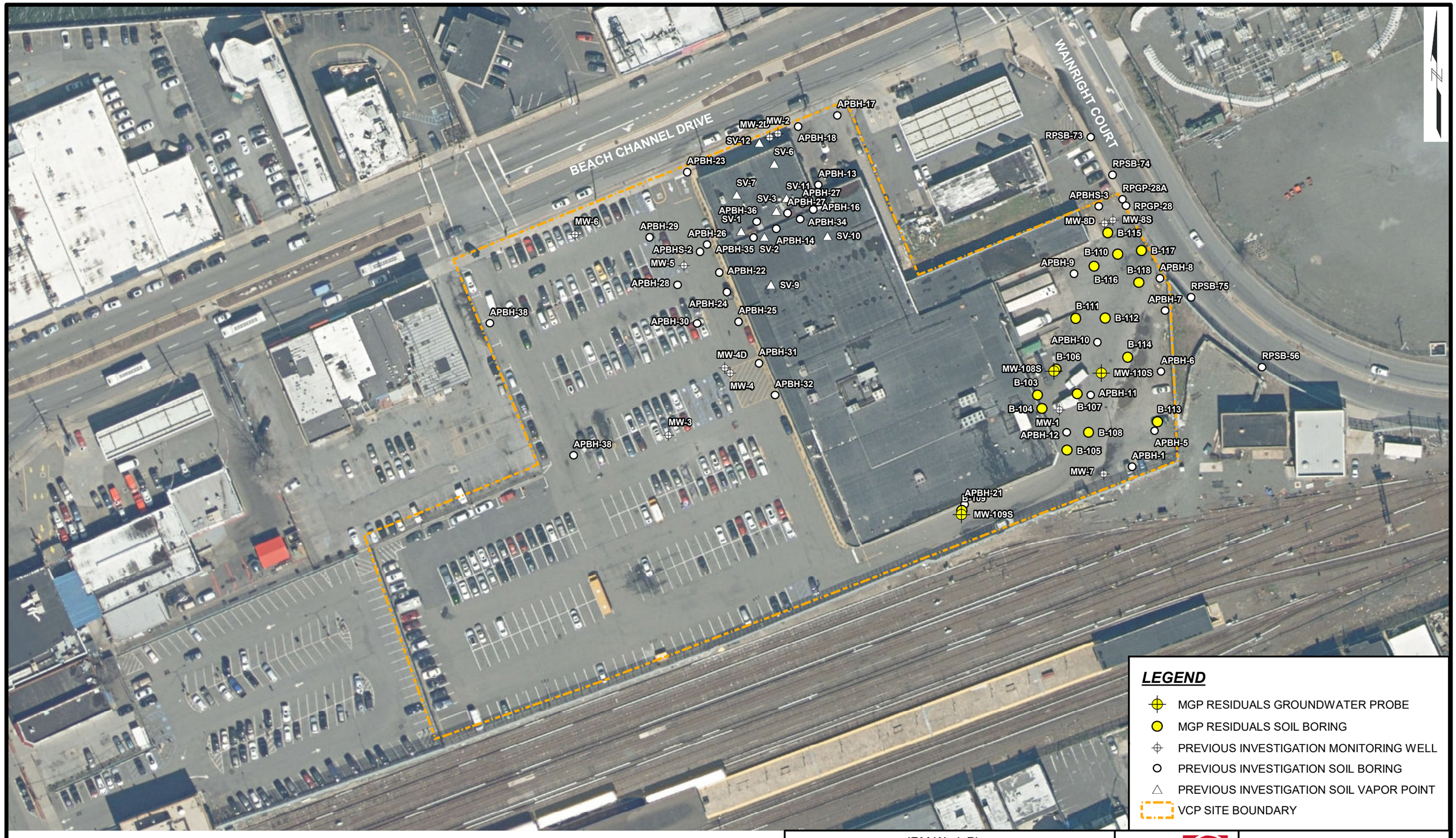

LEGEND

- MGP RESIDUALS GROUNDWATER PROBE
- MGP RESIDUALS SOIL BORING
- PREVIOUS INVESTIGATION MONITORING WELL
- PREVIOUS INVESTIGATION SOIL BORING
- PREVIOUS INVESTIGATION SOIL VAPOR POINT
- VCP SITE BOUNDARY

SOURCE:

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

0 80 160

SCALE: 1" = 80'

IRM Work Plan
Belle Harbor Shopping Center
Rockaway Park, New York

nationalgrid

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SAMPLE LOCATIONS

Project 093150 | June 2018 | Fig. 2

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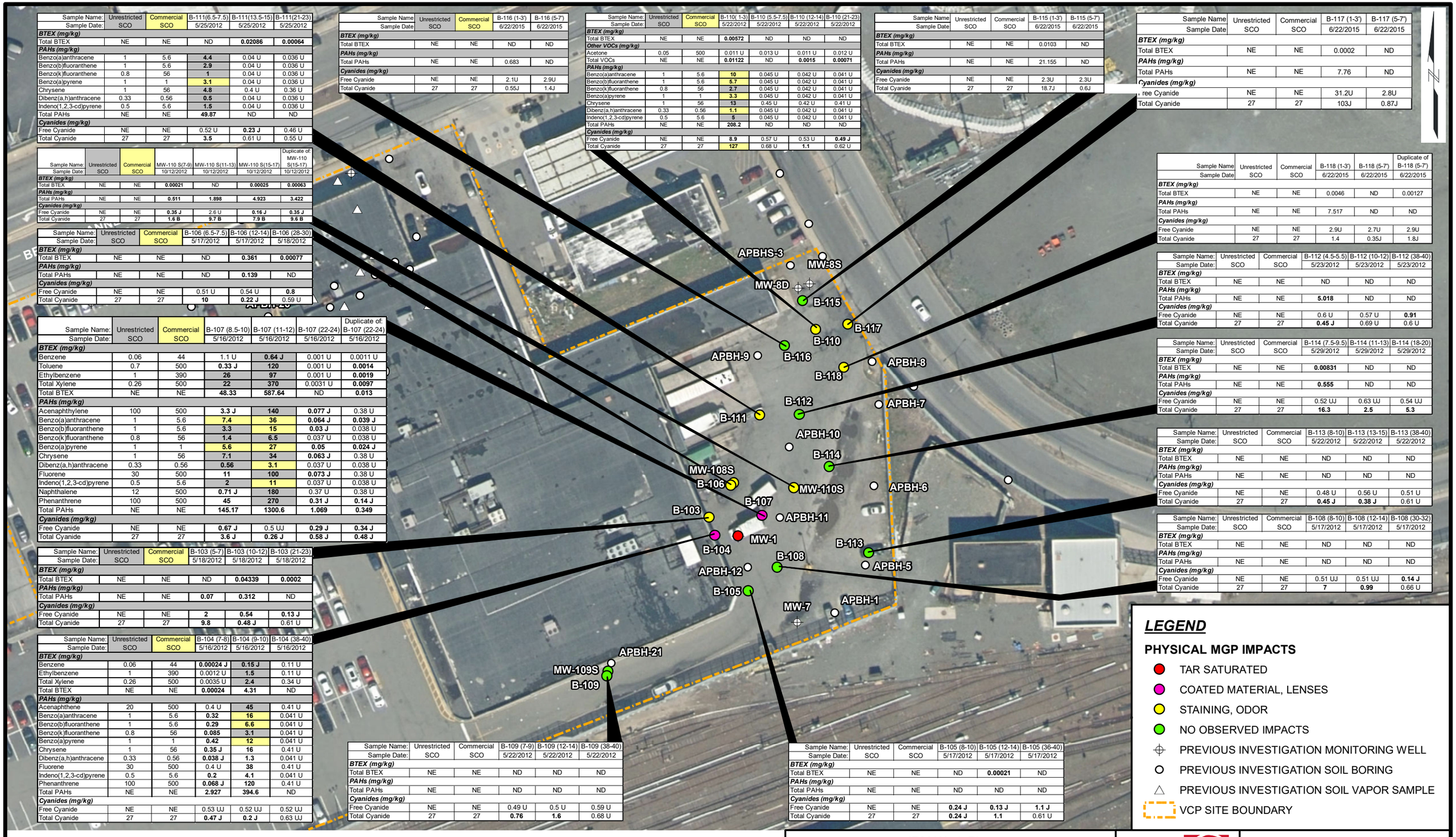

Sample Name:	Unrestricted	Commercial	B-111(6.5-7.5)	B-111(13.5-15)	B-111(21-23)
Sample Date:	SCO	SCO	5/25/2012	5/25/2012	5/25/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	**0.02086**	**0.00064**
PAHs (mg/kg)					
Benzo(a)anthracene	1	5.6	**4.4**	0.04 U	0.036 U
Benzo(b)fluoranthene	1	5.6	**2.9**	0.04 U	0.036 U
Benzo(k)fluoranthene	0.8	56	**1**	0.04 U	0.036 U
Benzo(a)pyrene	1	1	**3.1**	0.04 U	0.036 U
Chrysene	1	56	**4.8**	0.4 U	0.36 U
Dibenz(a,h)anthracene	0.33	0.56	**0.5**	0.04 U	0.036 U
Indeno(1,2,3-cd)pyrene	0.5	5.6	**1.5**	0.04 U	0.036 U
Total PAHs	NE	NE	**49.87**	ND	ND
Cyanides (mg/kg)					
Free Cyanide	NE	NE	0.52 U	**0.23 J**	0.46 U
Total Cyanide	27	27	**3.5**	0.61 U	0.55 U

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

Sample Name:	Unrestricted	Commercial	B-110(1-3)	B-110 (5.5-7.5)	B-110 (12-14)	B-110 (21-23)
Sample Date:	SCO	SCO	5/22/2012	5/22/2012	5/22/2012	5/22/2012
BTEX (mg/kg)						
Total BTEX	NE	NE	**0.00572**	ND	ND	ND
Other VOCs (mg/kg)						
Acetone	0.05	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	5.6	**10**	0.045 U	0.042 U	0.041 U
Benzo(b)fluoranthene	1	5.6	**5.7**	0.045 U	0.042 U	0.041 U
Benzo(k)fluoranthene	0.8	56	**2.7**	0.045 U	0.042 U	0.041 U
Benzo(a)pyrene	1	1	**3.3**	0.045 U	0.042 U	0.041 U
Chrysene	1	56	**13**	0.45 U	0.42 U	0.41 U
Dibenz(a,h)anthracene	0.33	0.56	**1.1**	0.045 U	0.042 U	0.041 U
Indeno(1,2,3-cd)pyrene	0.5	5.6	**5**	0.045 U	0.042 U	0.041 U
Total PAHs	NE	NE	**208.2**	ND	ND	ND
Cyanides (mg/kg)						
Free Cyanide	NE	NE	**8.9**	0.57 U	0.53 U	**0.49 J**
Total Cyanide	27	27	**127**	0.68 U	**1.1**	0.62 U

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

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

Sample Name:	Unrestricted	Commercial	MW-110 S(7-9)	MW-110 S(11-13)	MW-110 S(15-17)	Duplicate of: MW-110 S(15-17)
Sample Date:	SCO	SCO	10/12/2012	10/12/2012	10/12/2012	10/12/2012
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**
Cyanides (mg/kg)						
Free Cyanide	NE	NE	**0.35 J**	2.6 U	**0.16 J**	**0.35 J**
Total Cyanide	27	27	**1.6 B**	**9.7 B**	**7.9 B**	**9.6 B**

Sample Name	Unrestricted	Commercial	B-118 (1-3')	B-118 (5-7')	Duplicate of B-118 (5-7')
Sample Date	SCO	SCO	6/22/2015	6/22/2015	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
Cyanides (mg/kg)					
Free Cyanide	NE	NE	2.9U	2.7U	2.9U
Total Cyanide	27	27	1.4	0.35J	1.8J

Sample Name:	Unrestricted	Commercial	B-106 (6.5-7.5)	B-106 (12-14)	B-106 (28-30)
Sample Date:	SCO	SCO	5/17/2012	5/17/2012	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
Cyanides (mg/kg)					
Free Cyanide	NE	NE	0.51 U	0.54 U	**0.8**
Total Cyanide	27	27	**10**	**0.22 J**	0.59 U

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

Sample Name:	Unrestricted	Commercial	B-107 (8.5-10)	B-107 (11-12)	B-107 (22-24)	Duplicate of: B-107 (22-24)
Sample Date:	SCO	SCO	5/16/2012	5/16/2012	5/16/2012	5/16/2012
BTEX (mg/kg)						
Benzene	0.06	44	1.1 U	**0.64 J**	0.001 U	0.0011 U
Toluene	0.7	500	**0.33 J**	**120**	0.001 U	**0.0014**
Ethylbenzene	1	390	**26**	**97**	0.001 U	**0.0019**
Total Xylene	0.26	500	**22**	**370**	0.0031 U	**0.0097**
Total BTEX	NE	NE	**48.33**	**587.64**	ND	**0.013**
PAHs (mg/kg)						
Acenaphthylene	100	500	**3.3 J**	**140**	**0.077 J**	0.38 U
Benzo(a)anthracene	1	5.6	**7.4**	**36**	**0.064 J**	**0.039 J**
Benzo(b)fluoranthene	1	5.6	**3.3**	**15**	**0.03 J**	0.038 U
Benzo(k)fluoranthene	0.8	56	**1.4**	**6.5**	0.037 U	0.038 U
Benzo(a)pyrene	1	1	**5.6**	**27**	**0.05**	**0.024 J**
Chrysene	1	56	**7.1**	**34**	**0.063 J**	0.38 U
Dibenz(a,h)anthracene	0.33	0.56	**0.56**	**3.1**	0.037 U	0.038 U
Fluorene	30	500	**11**	**100**	**0.073 J**	0.38 U
Indeno(1,2,3-cd)pyrene	0.5	5.6	**2**	**11**	0.037 U	0.038 U
Naphthalene	12	500	**0.71 J**	**180**	0.37 U	0.38 U
Phenanthrene	100	500	**45**	**270**	**0.31 J**	**0.14 J**
Total PAHs	NE	NE	**145.17**	**1300.6**	**1.069**	**0.349**
Cyanides (mg/kg)						
Free Cyanide	NE	NE	**0.67 J**	0.5 UJ	**0.29 J**	**0.34 J**
Total Cyanide	27	27	**3.6 J**	**0.26 J**	**0.58 J**	**0.48 J**

Sample Name:	Unrestricted	Commercial	B-114 (7.5-9.5)	B-114 (11-13)	B-114 (18-20)
Sample Date:	SCO	SCO	5/29/2012	5/29/2012	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
Cyanides (mg/kg)					
Free Cyanide	NE	NE	0.52 UJ	0.63 UJ	0.54 UJ
Total Cyanide	27	27	**16.3**	**2.5**	**5.3**

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

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

Sample Name:	Unrestricted	Commercial	B-103 (5-7)	B-103 (10-12)	B-103 (21-23)
Sample Date:	SCO	SCO	5/18/2012	5/18/2012	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
Cyanides (mg/kg)					
Free Cyanide	NE	NE	**2**	**0.54**	**0.13 J**
Total Cyanide	27	27	**9.8**	**0.48 J**	0.61 U

Sample Name:	Unrestricted	Commercial	B-104 (7-8)	B-104 (9-10)	B-104 (38-40)
Sample Date:	SCO	SCO	5/16/2012	5/16/2012	5/16/2012
BTEX (mg/kg)					
Benzene	0.06	44	**0.00024 J**	**0.15 J**	0.11 U
Ethylbenzene	1	390	0.0012 U	**1.5**	0.11 U
Total Xylene	0.26	500	0.0035 U	**2.4**	0.34 U
Total BTEX	NE	NE	**0.00024**	**4.31**	ND
PAHs (mg/kg)					
Acenaphthene	20	500	0.4 U	**45**	0.41 U
Benzo(a)anthracene	1	5.6	**0.32**	**16**	0.041 U
Benzo(b)fluoranthene	1	5.6	**0.29**	**6.6**	0.041 U
Benzo(k)fluoranthene	0.8	56	**0.085**	**3.1**	0.041 U
Benzo(a)pyrene	1	1	**0.42**	**12**	0.041 U
Chrysene	1	56	**0.35 J**	**16**	0.41 U
Dibenz(a,h)anthracene	0.33	0.56	**0.038 J**	**1.3**	0.041 U
Fluorene	30	500	0.4 U	**38**	0.41 U
Indeno(1,2,3-cd)pyrene	0.5	5.6	**0.2**	**4.1**	0.041 U
Phenanthrene	100	500	**0.068 J**	**120**	0.41 U
Total PAHs	NE	NE	**2.927**	**394.6**	ND
Cyanides (mg/kg)					
Free Cyanide	NE	NE	0.53 UJ	0.52 UJ	0.52 UJ
Total Cyanide	27	27	**0.47 J**	**0.2 J**	0.63 UJ

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

Sample Name:	Unrestricted	Commercial	B-105 (8-10)	B-105 (12-14)	B-105 (36-40)
Sample Date:	SCO	SCO	5/17/2012	5/17/2012	5/17/2012
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	**0.00021**	ND
PAHs (mg/kg)					
Total PAHs	NE	NE	ND	ND	ND
Cyanides (mg/kg)					
Free Cyanide	NE	NE	**0.24 J**	**0.13 J**	**1.1 J**
Total Cyanide	27	27	**0.24 J**	**1.1**	0.61 U

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
- VCP SITE BOUNDARY

SOURCE:

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

0 60 120

SCALE: 1" = 60'

IRM Work Plan
Belle Harbor Shopping Center
Rockaway Park, New York

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SUBSURFACE SOIL ANALYTICAL RESULTS AND PHYSICAL IMPACTS

Project 093150 | June 2018 | Fig. 3

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LEGEND

- PROPOSED DOCUMENTATION SAMPLE LOCATION
- TEMPORARY FENCE
- LIMITS OF IRM EXCAVATION
- EXCLUSION ZONE
- PERSONAL DECONTAMINATION (CONTAMINATION REDUCTION ZONE)
- SUPPORT ZONE
- VEHICLE DECONTAMINATION/ANTI-TRAC... PAD (CONTAMINANT REDUCTION ZONE)
- VCP SITE BOUNDARY

SOURCE:

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

0 80 160

SCALE: 1" = 80'

IRM Work Plan
Belle Harbor Shopping Center
Rockaway Park, New York

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LIMITS OF PROPOSED EXCAVATION

Project 093150 | June 2018 | Fig. 4

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Appendix A

Rockaway Park Data Excerpt

Table 4-25
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPGP-28A	RPSB-103	RPSB-104	RPSB-106	RPSB-107	RPSB-55
		4-8	4-6	4-6	6-8	4-6	10-12
		RPGP-28A (4-8)	RPSB-103 (4-6)	RPSB-104 (4-6)	RPSB-106 (6-8)	RPSB-107 (4-6)	RPSB-55 (10-12)
		07/24/2002	11/07/2001	11/07/2001	11/07/2001	11/07/2001	03/06/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.007	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0.007	0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(a)pyrene	0.061	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(b)fluoranthene	1.1	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(k)fluoranthene	1.1	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Chrysene	0.4	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Acenaphthene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Acenaphthylene	41	0.043 J	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Anthracene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(g,h,i)perylene	50	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Fluoranthene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Fluorene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Naphthalene	13	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Phenanthrene	50	0.047 J	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Pyrene	50	0.056 J	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Total Non-Carcinogenic PAHs		0.146	0	0	0	0	0
Total PAHs		0.146	0	0	0	0	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	420 U	400 U	360 U	350 U	370 U	400 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPGP-28A	RPSB-103	RPSB-104	RPSB-106	RPSB-107	RPSB-55
		4-8	4-6	4-6	6-8	4-6	10-12
		RPGP-28A (4-8)	RPSB-103 (4-6)	RPSB-104 (4-6)	RPSB-106 (6-8)	RPSB-107 (4-6)	RPSB-55 (10-12)
		07/24/2002	11/07/2001	11/07/2001	11/07/2001	11/07/2001	03/06/2000
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA	1.1 B
Barium	300	NA	NA	NA	NA	NA	4.9 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA	0.044 U
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA	2.4
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA	1.3
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA	0.018 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA	0.66 B
Silver	NE*	NA	NA	NA	NA	NA	0.22 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	NA	0.65 B	0.53 B	7 U	0.44 B	0.3 B
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-56	RPSB-73		RPSB-74		
		5-7 RPSB-56 (5-7) 03/06/2000	4-6 RPSB-73 (4-6) 02/25/2000	8-10 RPSB-73 (8-10) 02/25/2000	4-6 RPSB-74 (4-6) 02/25/2000	8-10 RPSB-74 (8-10) 02/25/2000	10-12 RPSB-74 (10-12) 02/25/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	13 U	NA	NA	NA	NA	NA
2-Butanone	300	13 U	NA	5 U	NA	5 U	NA
2-Hexanone	NE	13 U	NA	NA	NA	NA	NA
Acetone	200	16 B	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	13 U	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	13 U	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	13 U	NA	NA	NA	NA	NA
Carbon disulfide	2700	13 U	NA	NA	NA	NA	NA
Chlorobenzene	1700	13 U	NA	5 U	NA	5 U	NA
Methylene chloride	100	15	NA	NA	NA	NA	NA
n-Butylbenzene	NE	13 U	NA	NA	NA	NA	NA
n-Propylbenzene	NE	13 U	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	13 U	NA	NA	NA	NA	NA
Styrene	NE	13 U	NA	NA	NA	NA	NA
Tetrachloroethene	1400	13 U	NA	5 U	NA	5 U	NA
Trichloroethene	700	13 U	NA	5 U	NA	5 U	NA
Trichlorofluoromethane	NE	13 U	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**26**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(a)pyrene	0.061	**25**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(b)fluoranthene	1.1	**32**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(k)fluoranthene	1.1	**8.4**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Chrysene	0.4	**25**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Dibenzo(a,h)anthracene	0.014	**3.8 J**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	**17**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Total Carcinogenic PAHs		137.2	0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	5.5 J	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Acenaphthene	50	14	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Acenaphthylene	41	3.5 J	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Anthracene	50	19	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(g,h,i)perylene	50	17	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Fluoranthene	50	**63**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Fluorene	50	13	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Naphthalene	13	8.2	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Phenanthrene	50	**77**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Pyrene	50	**51**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Total Non-Carcinogenic PAHs		271.2	0	0	0	0	0
Total PAHs		408.4	0	0	0	0	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	2900	13 U	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	6800 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	6800 U	NA	33 U	NA	33 U	NA
2-Methylphenol	100	6800 U	NA	33 U	NA	33 U	NA
4-Methylphenol	900	6800 U	NA	33 U	NA	33 U	NA
Benzene, hydroxy-	NE	6800 U	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	6800 U	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	6800 U	NA	NA	NA	NA	NA
Carbazole	NE	9000	NA	NA	NA	NA	NA
Dibenzofuran	6200	**12000**	340 U	400 U	340 U	410 U	400 U
Di-n-butylphthalate	8100	6800 U	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	6800 U	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	6800 U	NA	NA	NA	NA	NA
p-Cymene	NE	13 U	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-56	RPSB-73		RPSB-74		
		5-7 RPSB-56 (5-7) 03/06/2000	4-6 RPSB-73 (4-6) 02/25/2000	8-10 RPSB-73 (8-10) 02/25/2000	4-6 RPSB-74 (4-6) 02/25/2000	8-10 RPSB-74 (8-10) 02/25/2000	10-12 RPSB-74 (10-12) 02/25/2000
Metals (mg/kg)							
Aluminum	NE*	428	NA	NA	NA	NA	NA
Antimony	NE*	0.31 U	NA	NA	NA	NA	NA
Arsenic	7.5	0.94 B	NA	NA	NA	NA	NA
Barium	300	2 B	NA	NA	NA	NA	NA
Beryllium	0.16	0.21 U	NA	NA	NA	NA	NA
Cadmium	1	0.041 U	NA	NA	NA	NA	NA
Calcium	NE*	96.2	NA	NA	NA	NA	NA
Chromium	10	1.5 B	NA	NA	NA	NA	NA
Cobalt	30	1.2 B	NA	NA	NA	NA	NA
Copper	25	3.3	NA	NA	NA	NA	NA
Iron	2000	1520	NA	NA	NA	NA	NA
Lead	NE*	13.5	NA	NA	NA	NA	NA
Magnesium	NE*	88	NA	NA	NA	NA	NA
Manganese	NE*	36	NA	NA	NA	NA	NA
Mercury	0.1	0.017 U	NA	NA	NA	NA	NA
Nickel	13	1.3 B	NA	NA	NA	NA	NA
Potassium	NE*	76.4 B	NA	NA	NA	NA	NA
Selenium	2	0.41 U	NA	NA	NA	NA	NA
Silver	NE*	0.21 U	NA	NA	NA	NA	NA
Sodium	NE*	82.6 B	NA	NA	NA	NA	NA
Thallium	NE*	0.31 U	NA	NA	NA	NA	NA
Vanadium	150	1.6 B	NA	NA	NA	NA	NA
Zinc	20	**26**	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.32 B	0.27 B	0.13 B	0.59 B	0.48 B	1.7
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	5 U	NA	5 U	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	33 U	NA	33 U	NA
p-Cresol (TCLP)	NE	NA	NA	33 U	NA	33 U	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	4.4 B	NA	3.9 B	NA
Barium (TCLP)	NE	NA	NA	9.8 B	NA	17.5 B	NA
Cadmium (TCLP)	NE	NA	NA	2 U	NA	2 U	NA
Lead (TCLP)	NE	NA	NA	3 U	NA	3 U	NA
Selenium (TCLP)	NE	NA	NA	4 U	NA	4 U	NA
Silver (TCLP)	NE	NA	NA	3 U	NA	3 U	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-75			RPSB-76		
		4-6 RPSB-75 (4-6) 02/28/2000	6-8 RPSB-75 (6-8) 02/28/2000	8-10 RPSB-75 (8-10) 02/28/2000	4-6 RPSB-76 (4-6) 02/28/2000	6-8 RPSB-76 (6-8) 02/28/2000	8-10 RPSB-76 (8-10) 02/28/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	0.37 U	0.46 U	0.41 U	0.046 J	**10**	0.39 U
Benzo(a)pyrene	0.061	0.37 U	0.46 U	0.41 U	0.35 U	**6.9**	0.39 U
Benzo(b)fluoranthene	1.1	0.37 U	0.46 U	0.41 U	0.35 U	**8.7**	0.39 U
Benzo(k)fluoranthene	1.1	0.37 U	0.46 U	0.41 U	0.35 U	**3.8**	0.39 U
Chrysene	0.4	0.37 U	0.46 U	0.41 U	0.047 J	**7.9**	0.39 U
Dibenzo(a,h)anthracene	0.014	0.37 U	0.46 U	0.41 U	0.35 U	**1 J**	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.37 U	0.46 U	0.41 U	0.35 U	**3.4**	0.39 U
Total Carcinogenic PAHs		0	0	0	0.093	41.7	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.37 U	0.46 U	0.41 U	0.35 U	1.7 U	0.39 U
Acenaphthene	50	0.37 U	0.46 U	0.41 U	0.35 U	1.7 U	0.39 U
Acenaphthylene	41	0.37 U	0.46 U	0.41 U	0.35 U	0.63 J	0.39 U
Anthracene	50	0.37 U	0.46 U	0.41 U	0.35 U	3.3	0.39 U
Benzo(g,h,i)perylene	50	0.37 U	0.46 U	0.41 U	0.35 U	2.5	0.39 U
Fluoranthene	50	0.37 U	0.46 U	0.41 U	0.044 J	17	0.39 U
Fluorene	50	0.37 U	0.46 U	0.41 U	0.35 U	0.65 J	0.39 U
Naphthalene	13	0.37 U	0.46 U	0.41 U	0.35 U	1.7 U	0.39 U
Phenanthrene	50	0.37 U	0.46 U	0.41 U	0.039 J	8	0.39 U
Pyrene	50	0.37 U	0.46 U	0.41 U	0.05 J	14	0.39 U
Total Non-Carcinogenic PAHs		0	0	0	0.133	46.08	0
Total PAHs		0	0	0	0.226	87.78	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	370 U	460 U	410 U	350 U	1700 U	390 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-75			RPSB-76		
		4-6 RPSB-75 (4-6) 02/28/2000	6-8 RPSB-75 (6-8) 02/28/2000	8-10 RPSB-75 (8-10) 02/28/2000	4-6 RPSB-76 (4-6) 02/28/2000	6-8 RPSB-76 (6-8) 02/28/2000	8-10 RPSB-76 (8-10) 02/28/2000
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	2.1	0.56 B	0.22 B	3.4	0.52 B	0.28 B
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	5 U	NA	NA	5 U	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	33 U	NA	NA	33 U	NA
p-Cresol (TCLP)	NE	NA	33 U	NA	NA	33 U	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	4.8 B	NA	NA	4 U	NA
Barium (TCLP)	NE	NA	19.1 B	NA	NA	9.5 B	NA
Cadmium (TCLP)	NE	NA	0.4 U	NA	NA	0.4 U	NA
Lead (TCLP)	NE	NA	2.3 U	NA	NA	10.6	NA
Selenium (TCLP)	NE	NA	4 U	NA	NA	5.3 B	NA
Silver (TCLP)	NE	NA	2 U	NA	NA	2 U	NA

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-26
Soil Analytical Results
South and West Adjacent Areas (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date	
		RPGP-28A	RPSB-73
		20-24	12-14
		RPGP-28A (20-24)	RPSB-73 (12-14)
		07/24/2002	02/25/2000
Volatile Organic Compounds (VOCs)			
BTEX (mg/kg)			
Benzene	0.06	0.005 U	0.001 U
Ethyl benzene	5.5	0.005 U	0.001 U
Toluene	1.5	0.005 U	0.001 U
Xylene (total)	1.2	0.005 U	0.001 U
Total BTEX		0	0
Other Volatile Organic Compounds (ug/kg)			
2-Butanone	300	5 U	NA
2-Hexanone	NE	1 J	NA
Acetone	110	11	NA
Carbon disulfide	2700	2 J	NA
Chlorobenzene	1700	5 U	NA
Methylene chloride	100	7 B	NA
Styrene	NE	5 U	NA
Tetrachloroethene	1400	5 U	NA
Trichloroethene	700	5 U	NA
Semivolatile Organic Compounds (SVOCs)			
Carcinogenic PAHs (mg/kg)			
Benzo(a)anthracene	0.224	0.38 U	0.4 U
Benzo(a)pyrene	0.061	0.38 U	0.4 U
Benzo(b)fluoranthene	1.1	0.38 U	0.4 U
Benzo(k)fluoranthene	1.1	0.38 U	0.4 U
Chrysene	0.4	0.38 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.38 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.38 U	0.4 U
Total Carcinogenic PAHs		0	0
Non-Carcinogenic PAHs (mg/kg)			
2-Methylnaphthalene	36.4	0.38 U	0.4 U
Acenaphthene	50	0.38 U	0.4 U
Acenaphthylene	41	0.38 U	0.4 U
Anthracene	50	0.38 U	0.4 U
Benzo(g,h,i)perylene	50	0.38 U	0.4 U
Fluoranthene	50	0.38 U	0.4 U
Fluorene	50	0.38 U	0.4 U
Naphthalene	13	0.38 U	0.4 U
Phenanthrene	50	0.38 U	0.4 U
Pyrene	50	0.38 U	0.4 U
Total Non-Carcinogenic PAHs		0	0
Total PAHs		0	0
Other Semivolatile Organic Compounds (ug/kg)			
1,2-Dichlorobenzene	2900	380 U	NA
2,4-Dimethylphenol	NE	380 U	NA
2,4-Dinitrotoluene	NE	380 U	NA
2-Methylphenol	100	380 U	NA
4-Methylphenol	900	380 U	NA
Benzene, hydroxy-	NE	380 U	NA
Bis(2-ethylhexyl)phthalate	50000	380 U	NA
Butylbenzylphthalate	50000	380 U	NA
Dibenzofuran	6200	380 U	400 U
Di-n-butylphthalate	8100	380 U	NA
Di-n-octylphthalate	50000	380 U	NA
N-Nitrosodiphenylamine (1)	NE	380 U	NA
Total Cyanide (mg/kg)			
Cyanide	NE	NA	0.26 B

Table 4-26 (continued)
Soil Analytical Results
South and West Adjacent Areas (12-24 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-27
Soil Analytical Results
South and West Adjacent Areas (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPGP-28A	RPSB-55	RPSB-56
		40-44	40-42	40-42
		RPGP-28A (40-44)	RPSB-55 (40-42)	RPSB-56 (40-42)
		07/24/2002	03/06/2000	03/06/2000
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.42 U	0.41 U	0.41 U
Benzo(a)pyrene	0.061	0.42 UJ	0.41 U	0.41 U
Benzo(b)fluoranthene	1.1	0.42 UJ	0.41 U	0.41 U
Benzo(k)fluoranthene	1.1	0.42 UJ	0.41 U	0.41 U
Chrysene	0.4	0.42 U	0.41 U	0.41 U
Dibenzo(a,h)anthracene	0.014	0.42 UJ	0.41 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 UJ	0.41 U	0.41 U
Total Carcinogenic PAHs		0	0	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.42 U	0.41 U	0.41 U
Acenaphthene	50	0.42 U	0.41 U	0.41 U
Acenaphthylene	41	0.42 U	0.41 U	0.41 U
Anthracene	50	0.42 U	0.41 U	0.41 U
Benzo(g,h,i)perylene	50	0.42 UJ	0.41 U	0.41 U
Fluoranthene	50	0.42 U	0.41 U	0.41 U
Fluorene	50	0.42 U	0.41 U	0.41 U
Naphthalene	13	0.42 U	0.41 U	0.41 U
Phenanthrene	50	0.42 U	0.41 U	0.41 U
Pyrene	50	0.42 U	0.41 U	0.41 U
Total Non-Carcinogenic PAHs		0	0	0
Total PAHs		0	0	0
Other Semivolatile Organic Compounds (ug/kg)				
Dibenzofuran	6200	420 U	410 U	410 U
Metals (mg/kg)				
Arsenic	7.5	NA	1 B	1.1 B
Barium	300	NA	1.8 B	1.7 B
Chromium	10	NA	1.8 B	2.4
Lead	NE*	NA	0.85 B	0.9 B
Total Cyanide (mg/kg)				
Cyanide, total	NE	NA	0.2 U	0.27 B

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
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TCLP - Toxicity Characteristic Leaching Procedure
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BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Appendix B

Health and Safety Plan

GEI Consultants

Consulting
Engineers and
Scientists

Health and Safety Plan

Belle Harbor Shopping Center

Rockaway Park, New York

NYSDEC Consent Index No. D1-0002-98-11

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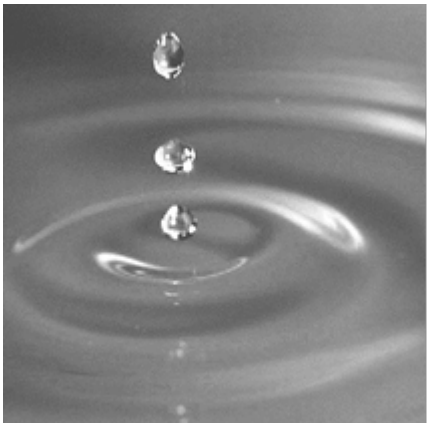
July 2017
Project 093150



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RECORD OF CHANGE		
Revision	**Date**	**Description**
0	**July 2017**	**Initial Draft**

1. Background Information

1.1 General

Engineer GEI Consultants, Inc., P.C. (GEI)
110 Walt Whitman Road, Suite 204
Huntington Station, NY 11746

Project Name Belle Harbor Site
Rockaway Park, NY

This Health and Safety Plan (HASP) establishes policies and procedures to protect GEI personnel from the potential hazards posed by the activities at the Belle Harbor Site located in Rockaway Park, New York (see **Appendix A** – Site-Specific Information). The site is currently owned by National Grid.

Reading of and adherence to the HASP is required of all on site GEI personnel. Subcontractors for this project will be required to develop their own HASP for protection of their employees, but at a minimum must adhere to applicable requirements set forth in this HASP. GEI will verify that its subcontractor's HASP includes National Grid's site-specific requirements as outlined in this HASP. Additionally, federal, state and local representatives, as well as National Grid employees may be required to sign and adhere to this HASP, depending on the nature of their presence onsite during activities conducted by GEI.

The plan identifies measures to minimize accidents and injuries, which may result from project activities, emergencies, or during adverse weather conditions. Activities performed under this HASP will comply with applicable parts of Occupational Safety and Health Administration (OSHA) Regulations, primarily 29 Code of Federal Regulations (CFR) Parts 1910 and 1926, and National Grid policies and procedures.

1.2 Project Description

Activities conducted at the Belle Harbor Site may consist of:

Site-wide tasks include:

- Soil Borings
- Groundwater Probes
- Soil and Groundwater Sampling
- Gauging and Recovery of Dense Non-Aqueous Phase Liquid (DNAPL)
- Well Installation

1.3 Site Description

The Belle Harbor site is a shopping center located at 112-15 Beach Channel Drive in Far Rockaway, New York. The property is bordered by Beach Channel Drive to the north, an electrical substation and former Manufactured Gas Plant (MGP) to the east, a New York City Department of Transportation parking lot to the west, and a Metropolitan Transit Authority (MTA) subway yard to the south. Further description of the site can be found in the *Supplemental Remedial Investigation Work Plan* for the Belle Harbor Shopping Center (July 2011) completed by Stantec.

The geographic boundaries of each operable unit are shown on figures provided in **Appendix A**. Work covered by this HASP may be performed within or near any of these operable units.

1.4 Hazard/Risk Analysis

1.4.1 Physical Hazards

Physical hazards associated with heavy equipment operations may be present should the need arise to excavate, trench, or install or abandon groundwater monitoring wells or other sample points. These activities would require the use of heavy equipment by subcontractors such as a backhoe or a drill rig, which is associated with, but not limited to, the following hazards:

- Bodily injuries
- Slipping, tripping or falling
- Heavy lifting

1.4.2 Fire and Explosion

Fire extinguishers are located on heavy equipment operating onsite and within any work vehicles on site. All fires should be reported to 911 emergency services. National Grid and the GEI project manager will determine if it is necessary to shut down site work for the day due to fire related issues.

1.4.3 Cold Stress

During the winter months, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, and poor judgment. The procedures to be followed regarding the avoidance of cold stress are provided in **Appendix B** – Cold Stress Guidelines.

1.4.4 Heat Stress

A heat stress prevention program will be implemented when ambient temperatures exceed 70ºF. The procedures to be followed are provided in **Appendix C** – Heat Stress Guidelines.

1.4.5 Noise

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps and generators. Site workers who will perform suspected or established high noise tasks and operations for short durations (less than 1-hour) shall wear hearing protection. If deemed necessary by the Site Safety Officer (SSO), the Corporate Health & Safety Officer (CHSO) will be consulted on the need for additional hearing protection and the need to monitor sound levels for site activities. Other workers who do not need to be in proximity of the noise should distance themselves from the equipment generating the noise.

1.4.6 Hand and Power Tools

In order to complete the various tasks for the project, personnel will use hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Work gloves, safety glasses, and hard hats will be worn by the operating personnel at all times when using hand and power tools and Ground Fault Indicator (GFI)-equipped circuits will be used for all power tools.

1.4.7 Slips, Trips, and Falls

Working in and around the site will pose slip, trip and fall hazards due to slippery surfaces. Excavation at the sites will cause uneven footing in the trenches and around the spoil piles. GEI employees will wear proper footwear (i.e. steel toe boots) and will employ good work practice and housekeeping procedures to minimize the potential for slips, trips, and falls.

1.4.8 Manual Lifting

Manual lifting of objects and equipment may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers should use power equipment (such as a forklift) to lift heavy loads whenever possible and should evaluate loads before trying to lift them (i.e., they should be able to easily tip the load and then return it to its original position). Carrying heavy loads with a buddy and proper lifting techniques include:

1) Make sure footing is solid
2) Make back straight with no curving or slouching
3) Center body over feet
4) Grasp the object firmly and as close to your body as possible

5) lift with legs
6) turn with your feet, don't twist

1.4.9 Projectile Objects and Overhead Dangers

Overhead dangers, including but not limited to falling debris and equipment, can occur while heavy machinery is in operation. GEI staff will be instructed to maintain a minimum distance from large overhead operations. Staff must also maintain proper communication with heavy equipment operators and their handlers, especially if work necessitates their presence beyond the minimum safe distance. Additionally, employees should be cognizant of low-hanging overhead power lines, as these can snag on vehicles entering and exiting the site. Vehicles that are large enough to damage overhead power lines require spotters when entering and exiting the site. Proper PPE will be worn at all times during these types of activities including steel-toed or equivalent boots, safety vests and hard hats.

1.4.10 Heavy Equipment Operation

Heavy equipment will not be operated by GEI personnel, but may be present on site due to continuing projects. GEI personnel should be cautious when working near operating heavy equipment, and maintain a safe distance from the equipment. Personnel should maintain eye contact with the vehicle spotter or operator before traversing any paths that may cross that of the machinery.

1.4.11 Excavation and Trenching

GEI personnel will not enter a trench or excavation that is greater than 4 feet deep.

The safety requirements for each excavation must be determined by a competent person who is capable of identifying existing and predictable hazards and work conditions that are unsanitary, hazardous, or dangerous to employees. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of any excavation activity (or ground intrusive activity, such as drilling), the location of underground installations will be determined. The New York State one-call center will be contacted by the Contractor / Subcontractor a minimum of 72 hours prior to excavation activities. It may also be necessary to temporarily support underground utilities during excavation. When excavations approach the estimated location of underground installations, the exact location of the underground installations shall be determined by means that are safe to workers, i.e., hand dig, test pits, etc.
- All excavations will be inspected daily by the competent person prior to

commencement of work activities. Evidence of cave-ins, slides, sloughing, or surface cracks or excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.

- Excavated and other materials or equipment that could fall or roll into the excavation shall be placed at least 5 feet from the edge of the excavation.
- Vehicular traffic and heavy equipment shall remain at least 5 feet from the face of the excavation.
- All excavation operations will cease immediately during hazardous weather conditions such as high winds, heavy rain, lightning and heavy snow.

Excavation Entry Safety

- The sides of all excavations in which personnel will be exposed to the danger of moving ground or potential cave-in will be adequately sloped, shored or contained within a trench box, or similar support structure designed and sealed by a professional engineer.
- The air in the excavation will be tested for oxygen deficiency, explosivity, organic vapors, carbon monoxide and hydrogen sulfide. The bottom, middle, top and corners of the excavation will be tested prior to entry and continuously during excavation entry.
- Ramps or ladders will be used to provide access and sufficient egress to the excavation. Ladders must be supplied for every 25 feet of lateral travel. Ladders must be securely anchored at the top or bottom and must extend at least 3 feet above the ground surface. A competent person is required to design ramps (those used exclusively for employee access/egress). Such ramps are constructed of wood, steel or earth. Structural ramps, used for vehicle/equipment access (steel or wood) must be designed by a competent person qualified in structural design. Vehicle ramps built of earth are not considered "structural ramps".
- Employees shall not work in excavations where there is an accumulation of water or in excavations where water is accumulating unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.
- Where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation, Permit Required Confined Space entry procedures (**Appendix I**) will be followed if entry into the excavation is required.

1.4.12 Working Within a Temporary Enclosure

Any work conducted within a temporary enclosure shall employ work zone and ambient monitoring in accordance with the Air Monitoring Plan and Section 8.0 of this HASP. If internal combustion engine equipment is used within the temporary enclosure, engineering controls, additional air monitoring parameters, and additional worker protection measures will need to be evaluated. If monitoring indicates the enclosure atmosphere meets the definition of

a Permit Required Confined Space (PRCS), then the procedures of **Appendix I** will apply in accordance with OSHA 1910.146 and 1910.134.

1.4.13 Line Breaking Activities

During line breaking activities, the potential exists for exposure to suspect asbestos containing materials (ACM). If suspect ACM is encountered, work will stop and will not resume until asbestos trained personnel have been upgraded to the proper PPE, and water is available to keep the work area and the suspect ACM wetted. All workers are to have completed asbestos awareness training prior to working with suspect ACM. The project management team (National Grid Project Manager, Consultant Project Manager, Contractor Project Manager, and CHSO) is to be notified if suspect ACM is encountered.

1.4.14 Additional Physical Hazards

GEI personnel should verify that all electric, gas, water, steam, sewer, and other utility service lines are located and marked before any intrusive work is started. In each case, any utility company that is involved should be notified in advance by the Contractor according to markout procedures, and its approval or services, if necessary, shall be obtained.

1.4.15 Electrical Hazards

The most serious physical hazard on site is the electrical hazards present in the LIPA electrical substation. The substation proper is enclosed by a perimeter fence and a locked gate. If GEI employees need access to the area located within the substation they will be escorted by a LIPA representative.

Electrical hazards are typically the most serious physical hazards associated with working on or near an electric substation. Activities at Belle Harbor Site are not conducted near or in the substation perimeter, however measures to mitigate exposure to overhead and subsurface electrical transmission and distribution lines should still be adhered to at all times due to the proximity of the substation. These measures include:

- When working within the perimeter of the substation, or while conducting intrusive work inside or outside the substation, Electrical Hazard (EH)-rated footwear, a hardhat, rubber gloves, and flame resistant clothing that meet NFPA 70E standards is to be worn. See Section 13 for information regarding PPE.
- A LIPA representative or designate must perform oversight during activities within the substation.
- Avoid carrying tools/equipment above waist height if overhead electric hazards exist.
- Maintain a minimum clearance of 16 feet from bus bars, transformer/capacitor electrodes and overhead transmission/distribution lines.

- Avoid working within the perimeter of the LIPA substation in conditions of high humidity or rain or thunderstorms.
- Stop work immediately and vacate the work area in the event lightning is observed.

Measures of protection that should be adhered to, should work be conducted **within the substation perimeter, or if work adjacent to the substation perimeter includes intrusive activities,** include:

- Contact DigNet of New York City and Long Island at 1-800-272-4420 at least 72 hours prior to any invasive activities for mark out of underground public utilities.
- Complete utility clearance documentation included in **Appendix D**.
- Obtain the most recent as-built drawings of the transmission/distribution line layout from National Grid.
- Mark out of underground transmission/distribution lines by National Grid survey/mark out personnel. Markouts must be checked every 10 days and updated as necessary.
- Conduct work under the supervision of a LIPA Health and Safety representative as required.
- Use hand digging tools specifically designed for use on substation property (i.e. insulated digging bar, long-handled spoon shovel, etc.). In addition, rubber gloves and flame resistant clothing are required if hand digging in a substation in/or around energized conductors, which is not anticipated to be the case.
- Use insulated lineman's gloves (NFPA 70E) when handling equipment that may come into contact with underground utilities.
- Electrical Hazard (EH)-rated footwear is required when working within the substation perimeter.
- Avoid carrying tools/equipment above waist height if overhead electric hazards exist.
- GEI vehicles will be parked outside of the substation proper during sampling activities.
- Maintain a minimum clearance of 16 feet from bus bars, transformer/capacitor electrodes and overhead transmission/distribution lines.
- Maintain a minimum offset of five feet from marked underground transmission/ distribution lines.
- Avoid working on substation in conditions of high humidity or rain or thunderstorms.
- Stop work immediately and vacate the work area in the event lightning is observed.

Additional LIPA requirements for working in and around electrical substations include:

- Gate to substation must remain closed and locked unless access is granted and observed by LIPA or LIPA-approved personnel
- Safety vests cannot have any zippers (Nomex vests are recommended)
- Be aware of exposed cables, transformers and other electrical structures. Many of these are not insulated and are at ground level or a level within bodily reach.

- Equipment in control houses may be exposed/uninsulated.
- LIPA oversight personnel must be notified if a lever is hit or touched. Do not turn the lever back to its original position.

Site personnel will assume that all electrical equipment at surface, subsurface, and overhead locations is energized, until the equipment has been designated as de-energized by a National Grid/LIPA representative. LIPA representatives will be responsible for de-energizing and lock out/tag out of all electrical equipment. If the equipment cannot be de-energized, work will stop and the Field Representative (FR) and/or SSO will consult with the GEI Project Manager (PM) and CHSO. All GEI employees will use proper PPE when working within the active substation including EH-rated safety boots, a hardhat, rubber gloves, and flame resistant clothing that meet NFPA 70E standards. GEI will notify National Grid prior to working adjacent to this equipment, and will verify that the equipment is energized or de-energized.

All power lines, which have been indicated by LIPA to be de-energized, must be locked out by a National Grid/LIPA representative, such that the lines cannot be energized when personnel are working near them. The lines shall not be unlocked and re-energized until GEI notifies National Grid that they have completed work in the area and that all personnel are clear of the area. National Grid representatives will provide GEI personnel with site-specific lockout/tagout documentation prior to onsite activities.

If power lines cannot be de-energized, the SSO will consult with National Grid to discuss how to proceed. Work tasks will only commence after determination that a safe working distance can be maintained and all personnel working in the area have been informed of the limitation. All work performed within the substation boundaries requires the use of task-specific PPE, as described in Section 13.

The subcontractor should verify that all electric, gas, water, steam, sewer, and other utility service lines are located and marked before any intrusive work is started. GEI must verify that the subcontractor has completed a utility mark out checklist prior to intrusive work in accordance with the Field Sampling Plan (FSP). In each case, any utility company that is involved should be notified in advance by the subcontractor according to markout procedures, and its approval or services, if necessary, shall be obtained.

Smoking is prohibited at or in the vicinity of hazardous operations or materials.

The potential hazards for this project are listed in the following Activity Hazard Analysis and Site Hazards sections.

Activity Hazard Analysis

Activity: Groundwater Monitoring and Soil Sampling		
Task	**Potential Hazard**	**Control Measure**
Groundwater and soil sample collection.	Traffic	Follow traffic safety guidelines in **Appendix F**.
	Contaminant Contact	Wear proper PPE during sampling including nitrile gloves and safety glasses. Dispose of gloves after use and wash hands.
	Insect Bites	Use insect repellant. Avoid areas where insects may be prevalent.
	Slips, Trips and Falls	Keep trafficked areas free of slip/trip/fall hazards.
	Heavy Lifting-Strains and Sprains	Use proper lifting techniques. Ask fellow worker for help .
	Poisonous Plants	Avoid brush areas. Staff should be able to identify common poisonous plants.
	Wild Animals	Avoid contact with wild animals.
	Electrical Substation Proximity	Wear proper PPE when working within close distance of substation. Follow National Grid, LIPA and OSHA guidelines for working distance to equipment.
Waste Characterization Sampling	Contaminant Contact	Wear proper PPE during sampling including nitrile gloves and safety glasses. Dispose of gloves after use and wash hands.
	Cuts or abrasions (handling drums)	Wear work gloves over nitrile gloves.
	Traffic	Follow traffic safety guidelines in **Appendix F**.
	Electrical Substation Proximity	Wear proper PPE when working within close distance of substation. Follow National Grid, LIPA and OSHA guidelines for working distance to equipment.
Drum Removal	Contaminant Contact	Wear proper PPE during sampling including nitrile gloves and safety glasses. Dispose of gloves after use and wash hands.

Activity: Groundwater Monitoring and Soil Sampling		
Task	**Potential Hazard**	**Control Measure**
	Cuts or abrasions (handling drums)	Wear work gloves over nitrile gloves.
	Heavy Lifting-Strains and Sprains	Use proper lifting techniques and equipment for the job. Ask fellow worker for help.
	Electrical Substation Proximity	Wear proper PPE when working within close distance of substation. Follow National Grid, LIPA and OSHA guidelines for working distance to equipment.

Activity: DNAPL Gauging and Recovery		
Task	**Potential Hazard**	**Control Measure**
DNAPL Gauging & Recovery	Repetitive Motion Injury (Standing, squatting and bending over)	Take regular breaks and do not work in unusual positions for long periods of time. Walk and stretch between tasks.
	Contaminant Contact	Wear proper PPE during sampling including nitrile gloves, face shield (recovery only) and safety glasses. Dispose of gloves after use and wash hands.
	Slips, Trips, and Falls	Keep trafficked areas free of slip/trip/fall hazards.
	Electrical Substation Proximity	Wear proper PPE when working within close distance of substation. Follow National Grid, LIPA and OSHA guidelines for working distance to equipment.

Activity: Installation/Abandonment/Maintenance of Groundwater Monitoring Wells, and/or Other Sample Points		
Task	**Potential Hazard**	**Control Measure**
Oversight for monitoring well and/or other sample point installation and abandonment.	Contaminant Contact	Wear proper PPE including nitrile gloves and safety glasses. Dispose of gloves after use and wash hands.
Replacement of well boxes and associated concrete on sample points.	Slips, Trips, and Falls	Keep trafficked areas free of slip/trip/fall hazards.
	Silica Dust Inhalation (From Grout/Cement Mixing)	Stay upwind of mixing area. Wear a dust mask if necessary.
	Drill Rig Proximity (Pinch Points, Crushing, Non-Secure Equipment)	Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation. Do not work near equipment

Activity: Installation/Abandonment/Maintenance of Groundwater Monitoring Wells, and/or Other Sample Points		
Task	**Potential Hazard**	**Control Measure**
		unless necessary.
	Loud noise	Wear hearing protection.
	Jackhammer Proximity (Debris, Crushing, Pinch Points)	Wear proper PPE, including impact resistant safety glasses. Maintain awareness of location of equipment.
Waste Management	Contaminant Contact	Wear proper PPE including nitrile gloves and safety glasses. Dispose of gloves after use and wash hands.
	Cuts or Abrasions (Handling Drums)	Wear work gloves over nitrile gloves.
Trenching Oversight	Cave Ins, Objects Rolling Into Trench Traffic	Verify that appropriate trenching guidelines are being followed. Follow traffic safety guidelines in **Appendix F**.
	Exposure of Underground Utilities	Utility location should be carried out prior to start of project.
	Electrical Substation Proximity	Wear proper PPE when working within close distance of substation. Follow National Grid, LIPA and OSHA guidelines for working distance to equipment.

Activity: Site Investigations/Site Remediations		
Task	**Potential Hazard**	**Control Measure**
Excavation and Trenching Oversight	Silica Dust Inhalation (From Concrete Break-Up, Grout/Cement Mixing)	Stay upwind of concrete break-up and grout mixing areas. Use water mist to control dust. Wear a dust mask if necessary.
	Loud Noise	Wear hearing protection.
	Proximity of Impacted Stockpiles	Maintain safe distance from stockpiles. Wear respiratory protection if necessary.
	Heavy Equipment Operations (Debris, Crushing, Pinch Points)	Wear proper PPE, including impact resistant safety glasses. Maintain awareness of location of equipment. Make eye-contact with operators to make sure they are aware of your position when navigating in the vicinity of heavy equipment.

Activity: Site Investigations/Site Remediations		
Task	**Potential Hazard**	**Control Measure**
	Slips, Trips and Falls	Keep trafficked areas free of slip/trip/fall hazards. Maintain awareness of excavation and trench perimeters.
	Traffic	Follow traffic safety guidelines in **Appendix F**
	Contaminant Contact	. Wear proper PPE including nitrile gloves and safety glasses. Dispose of gloves after use and wash hands.
	Electrical Substation Proximity	Wear proper PPE when working within close distance of substation. Follow National Grid, LIPA and OSHA guidelines for working distance to equipment.

Site-Wide Potential Hazards	**Control Measures**
Inclement Weather	Weather reports, proper clothing, and work stoppage.
Heat/Cold Stress	Proper clothing, acclimatization, regular work breaks, fluid intake, watch for signs of heat/cold stress.

1.5 Evaluation of Potential Chemical Hazards

The characteristics of compounds at the Site are discussed below for information purposes. Adherence to the safety and health guidelines in this HASP should reduce the potential for exposure to the compounds discussed below. Table 1-1 presents chemical data regarding potential exposure and monitoring for the chemical types listed below. Chemicals defined as "present" or "not present" at the site were determined based upon post-remediation data that reflects the current state of contaminants monitored at the site.

1.5.1 Volatile Organic Compounds (VOCs)

VOCs, such as benzene, toluene, ethyl benzene, and xylene (BTEX) are present in soil and groundwater and in some cases chemical components in non-aqueous phase liquids (NAPL) such as oil or tar within soils and underground structures. At high concentrations, these compounds generally have a depressant effect on the central nervous system (CNS), may cause chronic liver and kidney damage, and some are suspected human carcinogens. Benzene is a known human carcinogen. Acute exposure may include headache, dizziness, nausea, and

skin and eye irritation. The primary route of exposure to VOCs is through inhalation and therefore respiratory protection is the primary control against exposure to VOCs.

1.5.2 Coal Tar and Coal Tar Products

Coal tar products, which are semi-volatile organic compounds (SVOCs), typically consist of a mixture of:

acenaphthene	chrysene
acenaphthylene	dibenz(a,h)anthracene
anthracene	fluoranthene
benz(a)anthracene	fluorene
benzo(b)fluoranthene	indeno(1,2,3cd)pyrene
benzo(k)fluorethene	2-methyl naphthalene
benz(a)pyrene	naphththalene
benzo(e)pyrene	phenanthrene
benzo(g,h,i)peryline	Phenols
	pyrene

Coal tar products and other SVOCs are present at the site within impacted soil and groundwater and as a DNAPL by-product of gas production within soils, former MGP structures, and abandoned pipelines.

Coal tar products such as those listed above may cause contact dermatitis. Direct contact can be irritating to the skin and produce itching, burning, swelling and redness. Direct contact or exposure to the vapors may be irritating to the eyes. Conjunctivitis may result from prolonged exposure. Coal tar is considered to be very toxic, if ingested. High levels of exposure to coal tar, though not anticipated during work activities conducted during this project, may increase the risk of cancer including lung, kidney and skin cancer. Naphthalene is also an eye and skin irritant and can cause nausea, headache, fever anemia, liver damage, vomiting convulsions and coma. Poisoning may occur by ingestion of large doses, inhalation or skin absorption.

The major route of entry for the work activities to be conducted at this site is through direct contact. Exposure is most likely when handling soil and water samples. Inhalation may occur when the soil is disturbed causing respirable and nuisance dust particles to become airborne. Details for monitoring procedures can be found in Section 2.

1.5.3 Heavy Metals

The Site potentially contains elevated levels of metals.

As with VOCs, the primary route of exposure is through inhalation of dust particles when soil is disturbed and becomes airborne.

1.5.4 Asbestos-Containing Materials

As asbestos containing materials (ACM) have not been identified onsite, they are not currently monitored for at the site.

1.5.5 Polychlorinated Biphenyls

As polychlorinated Biphenyls (PCBs) have not been identified on site, they are not currently monitored for at the site.

1.5.6 Cyanide

Cyanide compounds are common by-products of manufactured gas production. Hydrogen cyanide is toxic because it is a chemical asphyxiant. It replaces the oxygen in the blood and, thereby, suffocates the cells. Ferrocyanides are not considered toxic because the hydrogen cyanide ion is bound to tightly to the iron and cannot, therefore, replace the oxygen. It takes a great amount of heat and/or acid to release cyanide gas from the ferrocyanide molecule. Therefore, hydrogen cyanide is not a concern at the Site. However, it is National Grid policy to monitor for hydrogen cyanide in the work zone during earth-disturbing activities at sites where MGP-related contaminants have been found.

1.5.7 Hydrogen Sulfide

Hydrogen sulfide is another common by-product of manufactured gas production. Exposure to lower concentrations can result in eye irritation, a sore throat and cough, shortness of breath, and fluid in the lungs. These symptoms usually go away in a few weeks. Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness. Breathing very high levels (>800 ppm) of hydrogen sulfide can cause death within just a few breaths. The primary route of exposure is through inhalation and therefore respiratory protection is the primary control against exposure to hydrogen sulfide.

1.5.8 Evaluation of Organic Vapor Exposure

During intrusive activities, the requirement for air monitoring reduces the risk of overexposure by indicating when action levels have been exceeded and when PPE must be upgraded or changed. Action levels for VOCs and associated contingency plans for the work zone are discussed within Section 2. Air monitoring will be conducted during intrusive activities (such as drilling) and PID screening of well head spaces will be conducted during groundwater sampling activities.

Exposure to organic vapors shall be evaluated and/or controlled by:

- Monitoring air concentrations for organic vapors in the breathing zone with a photo-ionization detector (PID).
- When possible, engineering control measures will be utilized to suppress the volatile organic vapors. Engineering methods can include utilizing a fan to promote air circulation, utilizing volatile suppressant foam, providing artificial ground cover or covering up the impacted material with a tarp to mitigate volatile odors.
- When volatile suppression or other engineering controls are not effective and organic vapor meters indicate concentrations above the action levels, then appropriate respiratory protection (i.e., air purifying respirator with organic vapor cartridge) will be employed.

Specific chemical hazards information from the Material Safety Data Sheet (MSDS) and Occupational Health Guidelines are summarized in Table 1-1. MSDSs for decontamination chemicals, calibration gases, sample preservation chemicals, or other chemicals that may be used on site, are kept in a separate MSDS binder on site.

Table 1-1
Chemical Data

Compound	CAS #	American Conference of Industrial Hygienists (ACGIH) threshold limit value (TLV)	OSHA permissible exposure limit (PEL)	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Arsenic	7440-38-2	0.01 mg/m^3	0.01 mg/m^3	Inhalation Skin Absorption Ingestion Skin Contact	Ulceration of nasal septum, derm, GI disturbances, peripheral neuropathy, resp. irrt, hyperpigmentation of skin, potential carcinogen	Liver, kidneys, skin, lungs, lymphatic system	Metal: Silver-gray or tin-white, brittle, odorless solid FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Benzene	71-43-2	0.5 parts ppm (Skin)	1 ppm TWA 5 ppm STEL	Inhalation Skin Absorption Ingestion Skin Contact	Irritation of eyes, skin, nose, respiratory system, giddiness, headache, nausea; staggering gait, fatigue, anorexia, weakness, dermatitis, bone marrow depression, known human carcinogen	Eyes, skin, CNS, bone marrow, blood	FP: 12° F, LEL: 1.2% UEL: 7.8% VP: 75 mm
Copper	7440-50-8	1.0 mg/m^3	1.0 mg/m^3	Inhalation Ingestion Skin Contact	Irritation of eyes, nose, pharynx; nasal septum perf; metallic taste, skin irritation	Respiratory system, eyes, skin, liver, kidneys (increase risk with Wilson's disease)	Reddish, lustrous, malleable, odorless solid FP: NA IP: NA LEL: NA UEL NA VP: 0 mm
Ethylbenzene	100-41-4	100 ppm	100 ppm	Inhalation Ingestion Skin Contact	Eye, skin, mucous membrane irritation; headache; dermatitis, narcosis; coma	Eyes, skin, respiratory system, CNS	FP: 55° F LEL: 0.8% UEL:6.7% VP: 7 mm
Hydrogen cyanide	74-90-8	4.7 ppm (5 milligram	10 ppm (11 mg/m^3) [skin]	Inhalation Ingestion Absorption	Asphyxia; weakness, headache, confusion; nausea, vomiting; increased rate and depth of	CNS, Cardiovascular system, thyroid,	Colorless or pale-blue liquid or gas (above 78°F) with a bitter, almond-like odor.

Table 1-1
Chemical Data

Compound	CAS #	American Conference of Industrial Hygienists (ACGIH) threshold limit value (TLV)	OSHA permissible exposure limit (PEL)	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
		s mg/m^3) STEL [skin]		Skin/Eye Contact	respiration or respiration slow and gasping; thyroid, blood changes	blood	VP: 630 mmHg
Hydrogen sulfide	7783-06-4	10 ppm TWA, 15 ppm STEL	20 ppm continuous, 50 ppm [10-min. Maximum peak]	Inhalation Skin/Eye Contact	Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, fatigue, irritability, insomnia; gastrointestinal disturbance; liquid: frostbite	Eyes, respiratory system, CNS	Colorless gas with a strong odor of rotten eggs.VP: 17.6 atm
Iron	7439-89-6	1.0 mg/m^3	NA	Inhalation Ingestion Skin Contact	Irritation of eyes, skin, mucus membrane, abdominal pain, diarrhea, vomit, possible liver damage	Eyes, skin, respiratory system, liver, GI tract	Appearance and odor vary dependent upon specific soluble iron salt. FP: NA IP: NA LEL: NA UEL: NA VP: 4 mm
Lead	7439-92-1	0.050 mg/m^3	0.05 mg/m^3 A.L. 0.03 mg/m3	Inhalation Ingestion Skin Contact	Weakness, insomnia; facial pallor; pal eye, anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis of wrist and ankles;	Eyes, GI tract, Central Nervous System, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. FP: NA LEL: NA UEL: NA VP: 0 mm

Table 1-1
Chemical Data

Compound	CAS #	American Conference of Industrial Hygienists (ACGIH) threshold limit value (TLV)	OSHA permissible exposure limit (PEL)	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
					irritates eyes, hypo tension		
Manganese	7439-96-5	TWA 1 mg/m^3 ST 3 mg/m^3	C 5 mg/m^3	Inhalation, ingestion	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage	Respiratory system, central nervous system, blood, kidneys	A lustrous, brittle, silvery solid. FP: NA LEL: NA UEL: Na VP: 0 mmHg
PAHs as Volatiles and Semi-Volatiles	65996-93-2	0.2 mg/m3	0.2 mg/m^3	Inhalation Skin contact Ingestion	Irritant to eyes, swelling, acne contact dermatitis, chronic bronchitis	Respiratory system, Central Nervous System, liver, kidneys, skin, bladder,	Black or dark brown amorphous residue.
Selenium	7782-49-2	0.2 mg/m^3	0.2 mg/m^3	Inhalation Ingestion Skin Contact	Irritant to eyes, skin, nose and throat, visual disturbance, headache, chills, fever, breathing difficulty, bronchitis, metallic taste, garlic breath, GI disturbance, dermatitis, eye and skin burns,	Eyes, skin, respiratory system, liver, kidneys, blood spleen	Amphorous or crystalline, red to gray solid FP: NA LEL: NA UEL: NA VP: 0 mm
Toluene	108-88-3	50 ppm	200 ppm	Inhalation Skin Absorption	Eye, nose irritation; fatigue, weakness, confusion, euphoria,	Eyes, skin, respiratory system,	FP: 40^o F LEL: 1.1% UEL:7.1%

Table 1-1
Chemical Data

Compound	CAS #	American Conference of Industrial Hygienists (ACGIH) threshold limit value (TLV)	OSHA permissible exposure limit (PEL)	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
				Ingestion Skin Contact	dizziness, headache; dilated pupils, tearing of eyes; nervousness, muscle fatigue, insomnia, tingling in limbs; dermatitis	Central Nervous System, liver, kidneys	VP: 21 mm
Xylene	1330-20-7	100 ppm	100 ppm	Inhalation Skin Absorption Ingestion Skin Contact	Eye, skin, nose, throat irritation; dizziness, excitement, drowsiness; lack of coordination, staggering gait; corneal damage; appetite loss, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, Central Nervous System, GI tract, blood, liver, kidneys	FP: 90° F LEL: 0.9% UEL: 6.7% VP: 9 mm
Zinc	1314-13-2	5.0 mg/m^3	5.0 mg/m^3	Inhalation	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; weak, lass; metallic taste; head; blurred vision; low back pain; vomit; fatigue; malaise; tight chest; dysphoria, decreased pulmonary function	Respiratory System	White odorless solid. FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm

Abbreviations	
C = ceiling limit, not to be exceeded	LEL = Lower explosive limit
CNS = Central Nervous System	mm = millimeter
CVS = Cardiovascular System	ppm = parts per million
eV = electron volt	Skin = significant route of exposure
FP = Flash point	STEL = Short-term exposure limit (15 minutes)
IP = Ionization Potential	TWA = Time-weighted average (8 hours)
GI = Gastro-intestinal	UEL = Upper explosive limit
mg/m^3= milligrams per cubic meter	VP = vapor pressure approximately 68° F in mm Hg (mercury)

1.6 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants. Workers will be instructed in hazard recognition, health hazards, and control measures during site-specific training.

1.6.1 Animals

During the conduct of site operations, wild animals such as stray dogs or cats, raccoons, and mice may be encountered. Workers shall use discretion and avoid all contact with wild animals. If these animals present a problem, efforts will be made to remove these animals from the site by contacting a licensed animal control technician.

1.6.2 Insects

Insects, including bees, wasps, hornets, and spiders, may be present at the Site making the chance of a bite possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life-threatening condition. Any individuals who have been bitten or stung by an insect should notify the SSO. The following is a list of preventive measures:

- Apply insect repellent prior to performing any field work and as often as needed throughout the work shift.
- Wear proper protective clothing (work boots, socks and light colored pants).
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Field personnel who may have insect allergies should have bee sting allergy medication on site and should provide this information to the SSO prior to commencing work.

1.6.2.1 Tick Borne Illnesses

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream that could lead to the worker contracting Lyme disease.

Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibodies has been successful in preventing more serious symptoms from developing. Early signs may include a flu-like illness, an expanding skin rash, and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems, as well as a disabling type of arthritis.

Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October when ticks are most active. A large expanding skin rash may develop around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash.

Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis.

The disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetated areas. If a tick is found biting an individual, the PM should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe. The employee will be offered the option for medical treatment by a physician, which typically involves prophylactic antibiotics. If personnel feel sick or have signs similar to those above, they should notify the PM immediately.

The deer tick can also cause **Babesiosis**, an infection of the parasite Babesia Microti. Symptoms of Baesiosis may not be evident, but may also include fever, fatigue and hemolytic anemia lasting from several days to several months. Babesiosis is most commonly diagnosed in the elderly or in individuals whose immune systems are compromised.

Ehrlichiosis is a tick-borne disease which can be caused by either of two different organisms. Human monocytic ehrlichiosis (HME) is caused by *Ehrlichia chaffeensis*, which is transmitted by the lone star tick (*Amblyomma americanum*). Human granulocytic anaplasmosis (HGA), previously known as human granulocytic ehrlichiosis (HGE), is caused by *Anaplasma phagocytophilia*, which is transmitted by the deer tick (*Ixodes scapularis*).

In New York State, most cases of ehrlichiosis have been reported on Long Island and in the Hudson Valley. Ehrlichiosis is transmitted by the bite of infected ticks, including the deer tick and the lone star tick. The symptoms of HME and HGE are the same and usually include fever, muscle aches, weakness and headache. Patients may also experience confusion, nausea, vomiting and joint pain. Unlike Lyme disease or Rocky Mountain spotted fever, a rash is not common. Infection usually produces mild to moderately severe illness, with high fever and headache, but may occasionally be life-threatening or even fatal. Symptoms appear one to three weeks after the bite of an infected tick. However, not every exposure results in infection.

Rocky Mountain spotted fever (RMSF) is a tick-borne disease caused by a rickettsia (a microbe that differs somewhat from bacteria and virus). Fewer than 50 cases are reported annually in New York State. In the eastern United States, children are infected most frequently, while in the western United States, disease incidence is highest among adult males. Disease incidence is directly related to exposure to tick-infested habitats or to infested pets. Most of the cases in New York State have occurred on Long Island. RMSF is characterized by a sudden onset of moderate to high fever (which can last for two or three weeks), severe headache, fatigue, deep muscle pain, chills and rash. The rash begins on the legs or arms, may include the soles of the feet or palms of the hands and may spread rapidly to the trunk or rest of the body. Symptoms usually appear within two weeks of the bite of an infected tick.

*(Information on Ehrlichiosis, Babesiosis, and Rocky Mountain Spotted Fever was derived from the New York State Department of Health).

1.6.3 Plants

The potential for contact with poisonous plants exists when performing field work in undeveloped and wooded areas. Poison ivy, sumac, and oak may be present onsite. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety “down.” Poison sumac has white, “hairy” berry clusters. Poison oak can be present as a sparingly branched shrub. Poison oak is similar to poison ivy in that it has the same leaflet configuration, however, the leaves have slightly deeper notches. Prophylactic application of Tecnu may prevent the occurrence of exposure symptoms. Post exposure over the counter products are available and should be identified at the local pharmacist. Susceptible individuals should be identified to the PM.

Contact with poison ivy, sumac, or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin which needs first aid treatment. If a field worker believes they have contacted one

of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

1.7 Personal Safety

Field activities have the potential to take site workers into areas which may pose a risk to personal safety. The following website (source) has been researched to identify potential crime activity in the area of the project:

- http://www.nyc.gov/html/nypd/html/crime_prevention/crime_statistics.shtml

2011 crime statistics from this website report that the 100th precinct, which encompasses Belle Harbor, New York, recorded all crimes below the New York City total (see below).

Type of Crime	Belle Harbor & Vicinity	New York City Total*
Murder	1	515
Rape	5	1421
Robbery	86	19,714
Felony Assault	130	18,477
Burglary	138	18,716
Grand Larceny	145	38,501

*New York City Total includes values from Belle Harbor & Vicinity. To protect yourself, take the following precautions:

- Use the buddy system (teams of a minimum of two persons present);
- Let the SSO know when you begin work in these areas and when you leave;
- Call in regularly;
- Pay attention to what is going on around you; and
- If you arrive in an area and it does not look safe to get out of your vehicle, lock the doors and drive off quickly, but safely.

Site workers must not knowingly enter into a situation where there is the potential for physical and violent behaviors to occur. If site workers encounter hostile individuals or a confrontation develops in the work area, suspend work activities, immediately leave the area of concern, and contact local 911 for assistance. Notify the SSO and CHSO of any incidents once you are out of potential danger.

In the event of an emergency, prompt communications with local emergency responders is essential. At least one charged and otherwise functioning cell phone to facilitate emergency communications will be on site. Confirmation of cellular phone operation and site worker safety will be confirmed at the start, mid-point, and near the end of each working day.

2. Air Monitoring

Air monitoring shall be performed to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of worker protection needed on site in the event that intrusive work is conducted. Work requiring air monitoring includes the installation and/or abandonment of monitoring wells, sample points, and DNAPL recovery wells.

GEI may conduct perimeter air monitoring, and work zone monitoring for on-site workers during intrusive activities only. Activities requiring air monitoring will be conducted in accordance with a pre-approved work plan. GEI will monitor and document daily site conditions and operations and inform field representatives (FR) of results. If action levels are exceeded PM and the CHSO.

GEI will provide the following equipment for health and safety monitoring of onsite personnel:

- PID with 10.6 eV lamp or equivalent
- Drager Chip Measurement System (CMS) with appropriate gas detection chips
- Dust Meter
- Mutli-Gas Meter: Combustible Gas Indicator (CGI)/Oxygen (O2) / Hydrogen Sulfide (H_2S) / Hydrogen Cyanide (HCN) meter
- Sound Level Meter if deemed necessary by the PM and CHSO, type to be appropriate to the activities performed.

All air monitoring equipment will be calibrated and maintained in accordance with manufacturer's requirements. All calibrations will be recorded in the project notes daily or on a daily calibration form.

Organic vapor concentrations will be measured using the PID during intrusive activities. During intrusive operations, organic vapor concentrations shall be measured continuously. Organic vapor concentrations will be measured upwind of the work site(s) to determine background concentrations at least twice a day, (once in the morning and once in the afternoon). The FR will interpret monitoring results using professional judgment and according to the alert and action limits set forth in the associated site work plan.

A dust meter will be used to measure airborne particulate matter during intrusive activities. Monitoring will be continuous and readings will be averaged over a 15-minute period for comparison with the action levels. Monitoring personnel will make a best effort to collect dust monitoring data from downwind of the intrusive activity. If off-site sources are considered to be the source of the measured dust, upwind readings will also be collected.

A Multi-Gas meter shall be used to monitor for combustible gases and oxygen content during intrusive activities. The meter will also be equipped with an H_2S sensor and an HCN sensor. H_2S and HCN monitoring will be conducted concurrently with atmospheric monitoring for oxygen and combustible gases on a continuous basis. Staff conducting air monitoring should note that a sulfur-like odor may indicate the presence of H_2S, and that a bitter almond odor may indicate the presence of HCN.

Perimeter and work zone air monitoring will be conducted during intrusive activities such as monitoring well installation and abandonment, recovery well installation and abandonment, soil borings and groundwater probes. Table 2-1 provides a summary of real time air monitoring action levels and contingency plans for work zone activities. The below action levels are determined by halving the PELs or TLVs as set forth by the OSHA and the ACGIH. Oxygen values are based on the maximum use limits of a full-face respirator if oxygen were being displaced by a chemical.

TABLE 2-1
REAL TIME WORK ZONE AIR MONITORING ACTION LEVELS

Air Monitoring Instrument	Monitoring Location	Action Level (above background)	Site Action
PID	Work Zone	1.0 ppm	Use detector tube for benzene or Znose™ to determine if concentration is benzene. If benzene is detected, stop work, withdraw from the work area and notify the SSO and CHSO.
PID	Work Zone	0 – 50 ppm	If benzene is not detected, no respiratory protection is required
		50 – 100 ppm	Stop work, withdrawal from work area, institute engineering controls, if levels reach 100 ppm upgrade to Level C
		> 100 ppm	Stop work, withdraw from work area; notify SSO & CHSO
Oxygen meter	Work Zone	< 20.7%	Stop work; withdraw from work area; ventilate area, notify SSO & CHSO.
		> 21.1%	Stop work; withdraw from work area; notify SSO & CHSO.
H_2S meter	Work Zone	<5 ppm	No respiratory protection is required
		>5 ppm	Stop work, cover excavation, withdraw from work area, institute engineering controls, notify SSO & CHSO
HCN meter	Work Zone	<1.0 ppm	Run CMS Drager tube. Continue monitoring with real time meter, and continue work if CMS Drager Tube Reading is less than 2 ppm.
		1.0< HCN Conc.<2.0 ppm	Run CMS Drager tube and confirm concentration is less than 2.0 ppm, notify SSO and CHSO. Run CMS 26 tube for sulfur dioxide, hydrogen sulfide, and phosphine chip potential interferences. Continue to monitor with real time meter.
		>2.0 ppm	Stop work, and move (with continuous HCN monitoring meter) at least 25 ppm upwind of the excavation until continuous meter reads less than 1 ppm, Notify SSO & CHSO. Run CMS Drager hydrogen cyanide chip and re-evaluate activity, continue monitoring with a real time meter, resume work if concentrations read less than 1.0 ppm.

Air Monitoring Instrument	Monitoring Location	Action Level (above background)	Site Action
CGI	Work Zone	< 10 % LEL	Investigate possible causes, allow excavation to ventilate; use caution during procedures.
		> 10% LEL	Stop work; allow excavation, borehole to ventilate to < 10% LEL; if ventilation does not result in a decrease to < 10% LEL, withdraw from work area; notify SSO & CHSO.
Particulate Meter	Work Zone	150 µg/m^3	Implement work practices to reduce/minimize airborne dust generation, e.g., spray/misting of soil with water

Statement of Safety and Health Policy

GEI is committed to providing a safe and healthy work environment for its employees. To maintain a safe work environment, GEI has established an organizational structure and a Corporate Health and Safety Program to promote the following objectives:

- Reduce the risk of injury, illness, and loss of life to GEI employees.
- Maintain compliance with federal, state, and other applicable safety regulations.
- Minimize GEI employees' work exposure to potential physical, chemical, and biological hazards.

2.1 Key Project Personnel/Responsibilities and Lines of Authority

GEI Personnel		
Matt O' Neil	OU-1 Task Manager	Office: 401-533-5152 Cell: 860-608-9725
Chris Morris	Field Operations Manager Site Safety Officer (or designee)	Office: 631-759-2967 Cell: 631-484-9152
Mike Quinlan	Field Staff Lead	Office: 631-759-2972 Cell: 631-708-8063
Tess Landgraff	Local Health and Safety Coordinator	Office: 631-759-2963 Cell: 631-356-2287
Jeena Sheppard	Regional Health and Safety Officer (RHSO)	Office: 860-368-5348 Cell: 860-916-4167
Steve Hawkins	Corporate Health and Safety Officer (CHSO)	Office: 813-774-6564 Cell: 813-323-6220

Lines of Authority will be as follows:

On site – GEI will have responsibility for safety of its employees during the work performed at the site. GEI's FR will have a cell phone available to contact the appropriate local authorities, in the event of an emergency. The FR will be available for communication with the SSO and PM and with the National Grid representative. The FR and/or SSO may change due to the nature of work being conducted on site.

2.2 PM

Responsibilities of the PM include the following:

- Verifies implementation of the HASP
- Conducts periodic inspections and documents these in the field book
- Participates in incident investigations
- Verifies the HASP has all of the required approvals before any site work is conducted
- Verifies that the National Grid site manager is informed of project changes, which require modifications of the HASP
- Has overall responsibility for project health and safety
- Acts as the primary point of contact with National Grid for site related activities and coordination with non-project related site operations
- Overseeing of performance of project tasks as outlined in the scope of work
- Plans field work using appropriate safe procedures and equipment
- Verifies and documents current training and medical monitoring clearance for GEI project staff
- Verifies that subcontractor has a site-specific HASP

2.3 CHSO

The CHSO is a qualified health and safety professional with experience in hazardous waste site remediation activities. Responsibilities of the CHSO include the following:

- Provides support for the development and approval of the HASP
- Serves as the primary contact to review health and safety matters that may arise
- Approves revised or new safety protocols for field operations
- Coordinates revisions of this HASP with field personnel
- Coordinates upgrading or downgrading of PPE with the site manager
- Leads the investigation of all accidents/incidents
- Provide the necessary training of GEI field crews in accordance with OSHA regulations and provides proof of training to the SSO prior to GEI personnel entering the site

2.4 SSO

Responsibilities of the SSO include the following:

- Verifies that the HASP is implemented and that all health and safety activities identified in the HASP are conducted and/or implemented
- Verifies that field work is scheduled with adequate personnel and equipment resources to complete the job safely and enforces site health and safety rules

- Verifies that adequate communications between field crews and emergency response personnel is maintained during emergency situations
- Verifies that field site personnel are adequately trained and qualified to work at the site and that proper PPE is utilized by field teams
- Investigate and report all accidents/incidents to the CHSO and PM
- Stop work if necessary
- Identifies operational changes which require modifications to the HASP and ensures that the procedure modifications are implemented and documented through changes to the HASP, with CHSO and National Grid approval
- Determines upgrades or downgrades of PPE based on site conditions and/or real-time monitoring results with CHSO and National Grid approval
- Reports to the CHSO and provides summaries of field operations and progress

2.5 FR

The FR is responsible for carrying out field work on a monthly, quarterly, or as-needed basis. Responsibilities of the FR include:

- Conducts routine safety inspection of the work area
- Documenting occurrences of unsafe activity and what actions were taken to rectify the situation
- Reports any unsafe or potentially hazardous conditions to the SSO and PM
- Maintains familiarity of the information, instructions, and emergency response actions contained in the HASP
- Complies with rules, regulations and procedures set forth in the HASP
- Prevents admittance to work site by unauthorized personnel
- Inspects all tools and equipment, including PPE, prior to use and documents inspection on the daily safety meeting form or in the appropriate field book
- Ensures that monitoring instruments are calibrated
- Stops work if necessary

3. Subcontractors

GEI subcontracts with various companies to conduct various work on site on an as-needed basis. Contact information for these subcontractors will be available when such work is being conducted.

GEI requires its subcontractors to work in a responsible and safe manner. Subcontractors for this project will be required to develop their own HASP for protection of their employees and must adhere to applicable requirements set forth in this HASP. GEI will verify that its subcontractor's HASP includes National Grid's site-specific requirements as outlined in this HASP.

4. Emergency Contact List

<table>
<tr><th colspan="4">EMERGENCY INFORMATION</th></tr>
<tr><td colspan="2">Important Phone Numbers</td><td colspan="2">Directions to:
St. John’s Episcopal Hospital
327 Beach 19th Street
Far Rockaway, New York 11691</td></tr>
<tr><td>Police</td><td>911</td><td colspan="2" rowspan="6">Head west on Beach Channel Drive for approximately 381 feet and make a U-turn. Continue for 2.0 miles and turn right onto Beach 73rd Street. Go 210 feet and make the 1st left onto Rockaway Freeway. Continue for 1.9 miles and turn right onto Seagirt Boulevard. Go 0.7 miles and turn left onto Beach 19th Street. Continue on for 0.2 miles and the hospital will be on the left.
.

Refer to Hospital Route Map in Appendix A.</td></tr>
<tr><td>Fire Department</td><td>911</td></tr>
<tr><td>Ambulance</td><td>911</td></tr>
<tr><td>Occupational Health Clinic
Land, Sea & Air Medical Review Specialists</td><td>(631) 225-3060
(Directions can be found in Appendix A)</td></tr>
<tr><td>St. John’s Episcopal Hospital</td><td>General
(718) 869-7000
Emergency
(718) 869-7755</td></tr>
<tr><td>NYSDEC Spill Hotline</td><td>(518) 457-7362</td></tr>
<tr><td>Chemtrec</td><td>1-800-424-9300</td><td colspan="2">Poison Control Center 1-800-222-1222</td></tr>
<tr><td>Project Manager</td><td>Matt O’Neil</td><td colspan="2">(631) 513-7191 cell
(631) 759-2964 office</td></tr>
<tr><td>Field Operations Manager</td><td>Chris Morris</td><td colspan="2">(631) 484-9152 cell
(631) 759-2967 office</td></tr>
<tr><td>Field Staff Lead</td><td>Mike Quinlan</td><td colspan="2">(631) 708-8063 cell
(631) 759-2972 office</td></tr>
<tr><td>Corporate H&S Officer</td><td>Steve Hawkins</td><td colspan="2">(813) 323-6220 cell
(813) 774-6564 office</td></tr>
<tr><td>Regional H&S Officer</td><td>Jeena Shephard</td><td colspan="2">(860) 916-4167 cell
(860) 368-5348 office</td></tr>
<tr><td>Local H&S Coordinator</td><td>Tess Landgraff</td><td colspan="2">(631) 356-2287 cell
(631) 759-2965 office</td></tr>
<tr><td colspan="4">Client Contacts</td></tr>
<tr><td>Thomas Campbell</td><td colspan="2">(516) 545-2555-office</td><td>(917)-734-3396-cell</td></tr>
</table>

5. Training Program

5.1 HAZWOPER Training

In accordance with 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste operations and emergency response (HAZWOPER). At a minimum, the training shall have consisted of instruction in the topics outlined in the standard and can include applicable sections of 29 CFR 1926. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical). Proof of training shall be submitted to the CHSO or his representative prior to the start of field activities.

5.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures. Proof of current 8-hour refresher training shall be submitted to the CHSO or his representative prior to the start of field activities.

5.3 Site-Specific Training

Prior to commencement of field activities, the CHSO or his representative will ensure all field personnel assigned to the project are familiarized with the activities, procedures, monitoring, and equipment used in the site operations. This includes site and facility layout, hazards associated with site tasks and activities, and emergency services at the site and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. Personnel that have not received site-specific training will not be allowed on site. All GEI personnel working on site will have current First Aid and CPR training.

5.4 Supervisor Training

Personnel acting in a supervisory capacity will have received 8 hours of instruction in addition to the initial 40 hours training. In addition, supervisors will have 1 year of field experience and training specific to work activities (i.e., sampling, construction observation, etc.).

5.5 On-site Safety Briefings

Other on-site GEI personnel will be given health and safety briefings by a FR to assist GEI personnel in safely conducting work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity to periodically update the workers on monitoring results. These safety briefing will be documented in the GEI field book or on the daily safety briefing form.

6. Medical Surveillance Program

GEI maintains a continuous, corporate, medical surveillance program that includes a plan designed specifically for field personnel engaged in work at sites where hazardous or toxic materials may be present. Steve Hawkins is GEI's CHSO and is responsible for the administration and coordination of medical evaluations conducted for GEI's employees at all branch office locations. Comprehensive examinations are given to all GEI field personnel participating in hazardous waste operations on an annual or biennial basis (as determined to be appropriate by the CHSO). The medical results of the examinations aid in determining the overall fitness of employees participating in field activities.

Under the CHSO's supervision, all field personnel undergo a complete initial physical examination, including a detailed medical and occupational history, before they participate in hazardous waste site investigations. Extensive annual/biennial reexaminations are also performed. Upon completion of these tests, personnel are certified by an occupational health physician as to whether they are fit for field work in general, and fit to use all levels of respiratory protection, in particular.

If a GEI employee or other project worker shows symptoms of exposure to a hazardous substance and wishes to be rechecked, he/she will be directed to the nearest area hospital or medical facility.

All GEI subcontractor personnel that will enter any active waste handling or other potentially-impacted area must certify that they are participating in a medical surveillance program that complies with OSHA regulations for hazardous waste operations (i.e., 29 CFR 1910.120 and 29 CFR 1926.65). Proof of medical clearance shall be submitted to the CHSO or his representative prior to the start of field activities.

7. Site Control Measures

7.1 Site Zones

During intrusive activities, site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially-hazardous areas. Barricade tape and cones will be used to designate work zone areas. Decontamination will be conducted as outlined in Section 12. If any heavily contaminated soils are encountered during intrusive work, separate wash areas for heavy equipment and personal PPE will be established.

8. Incident Reporting

GEI will report incidents involving GEI personnel or subcontractor personnel, such as lost time injuries, injuries requiring medical attention, near miss incidents, fires, fatalities, accidents involving the public, and property damage. The report shall be made to the GEI PM verbally within 2 hours of the incident. The PM will immediately inform the CHSO, the Director of Human Resources and a Project-Specific National Grid Representative for the incident. The Project-Specific National Grid Representative will be immediately notified with a phone call. An Incident Report Form (see **Appendix E**) will be completed and submitted to the CHSO and the Project-Specific National Grid Representative within 24 hours.

9. Medical Support

In case of minor injuries, on-site care shall be administered with the Site first aid kit. Staff may also go to the nearest occupational health provider (Land, Sea & Air Medical Review Specialists) located at 910 Route 109, in North Lindenhurst, New York. Directions to Land, Sea & Air can be found in **Appendix A**.

For serious injuries, call 911 and request emergency medical assistance. Seriously injured persons should not be moved, unless they are in immediate danger.

Section 5 and **Appendix A** contain detailed emergency information, including directions to the nearest hospital, and a list of emergency services and their telephone numbers. GEI field personnel will carry a cellular telephone.

10. Decontamination Procedures

10.1 Personnel Decontamination Station

As needed, a personnel decontamination station where workers can drop equipment and remove PPE will be set up at the decontamination pad by the Contractor when intrusive activities are conducted at the site. It will be equipped with basins for water and detergent, and trash bag(s) or cans for containing disposable PPE and discarded materials. Once personnel have decontaminated at this station and taken off their PPE, they will proceed to a portable sink where they will wash themselves wherever they have potentially been exposed to any contaminants (e.g., hands, face, etc.).

Contaminated PPE (gloves, suits, etc.) will be decontaminated and stored for reuse or placed in plastic bags (or other appropriate container) and disposed of in an approved facility.

Decontamination wastewater and used cleaning fluids will be collected and disposed of in accordance with all applicable state and federal regulations.

10.2 Decontamination Equipment Requirements

If heavily contaminated soils are encountered during intrusive work, the following equipment, as needed, will be in sufficient supply to implement decontamination procedures for GEI's equipment.

- Buckets
- Alconox™ detergent concentrate
- Hand pump sprayers
- Long handle soft bristle brushes
- Large sponges
- Cleaning wipes for respirators
- Bench or stool(s)
- Methanol
- Liquid detergent and paper towels
- Plastic trash bags

11. Personal Protective Equipment

PPE required for each level of protection is as follows.

Safety Equipment	Level A	Level B	Level C	Level D
Tyvek® suit or work overalls as appropriate for work being performed and materials handled				•
Hard hats with splash shields or safety glasses			•	•
Steel-toe boots with overboots as appropriate for work being performed and materials handled			•	•
Chemical-resistant gloves			•	•
Reflective Vest			•	•
Half- or full-face respirators with HEPA cartridges as approved by the CHSO			•	
Tyvek® splash-resistant suit			•	
Chemical-resistant clothing		•		
Long Pants	•	•	•	•
Pressure-demand, full-face SCBA or pressure-demand supplied air respirator with escape SCBA	•	•		
Inner and outer chemical-resistant gloves	•	•		
Chemical-resistant safety boots or shoes	•	•		
Two-way radio	•	•		
Hard hat	•	•	•	•
Fully encapsulating chemical-resistant suit	•			

PPE requirements for field activities are as follows.

Activity	Level of Protection	Backup Protection
Groundwater and soil vapor monitoring	D	C
DNAPL gauging and recovery	D	C
Install/Abandon wells and sample points	D	C
Oxygen and ozone injection system check	D	C
Intrusive activities (i.e. excavation, trenching)	D	C
Soil vapor intrusion and indoor/outdoor air investigations	D	C
Site investigation and remediation	D	C
Site Maintenance	D	C

PPE can include hardhats, safety glasses or face shields, steel toe/steel shank boots, hearing protection, nitrile gloves, and leather gloves as necessary.

OSHA Requirements for PPE

All PPE used during the course of this field investigation must meet the following OSHA standards:

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1 1968
Respiratory	29 CFR 1910.134	ANSI Z88.1 1980
Head	29 CFR 1910.135	ANSI Z89.1 1969
Foot	29 CFR 1910.136	ANSI Z41.1 1999 or ASTM F-2412-2005, and ASTM F-2413-2005

CRF = Code of Federal Regulations
ANSI = American National Standards Institute
ASTM = American Society For Testing and Materials

Any on-site personnel who have the potential to don a respirator must have a valid fit test certification and documentation of medical clearance. The CHSO will maintain such information on file for onsite personnel. The PM will obtain such information from the subcontractor's site supervisor prior to the initiation of any such work. Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.134). Air purifying respirators cannot be worn under the following conditions:

- Oxygen deficiency;
- IDLH concentrations; and
- If contaminant levels exceed designated use concentrations.

For most work conducted at the site, Level D PPE will include long pants, hard hats, safety glasses with side shields, and steel toe safety boots. When work is conducted in areas where NAPL or tar-saturated soil is anticipated, workers shall wear, at a minimum, modified Level D PPE, which can include Tyvec® coveralls and safety boots with overboots. The use of respirators is not anticipated.

Use of Level A or Level B PPE is not anticipated. If conditions indicating the need for Level A or Level B PPE are encountered, personnel will leave the work zone and this HASP will be revised with oversight of the CHSO, GEI personnel will not re-enter the work zone until conditions allow.

12. Supplemental Contingency Plan Procedures

12.1 Hazard Communication Plan

GEI personnel have received hazard communication training as part of their 40-hour HAZWOPER training. All hazardous materials used on the Site will be properly labeled, stored, and handled. MSDS will be available to on-site staff.

12.2 Fire

In the event of a fire, all personnel will evacuate the area. GEI's field representative will contact the local fire department and report the fire. Notification of evacuation will be made to the GEI PM and the CHSO. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM. **Appendix H** contains the Emergency Evacuation Plan should staff need to relocate during an emergency.

12.3 Severe Weather

The contingency plan for severe weather includes reviewing the expected weather to determine if severe weather is in the forecast. Severe weather includes high winds over 30 mph, heavy rains or snow squalls, thunderstorms, hurricanes, and lightning storms. If severe weather is approaching, the decision to evacuate GEI personnel and subcontractor personnel from the site is the responsibility of GEI's field representative. Notification of evacuation will be made to the GEI Project Manager, the CHSO, and the National Grid PM. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM.

12.4 Spills or Material Release

If a hazardous waste spill or material release, the SSO or their representative will immediately assess the magnitude and potential seriousness of the spill or release based on the following:

- MSDS, if applicable, for the material spilled or released
- Source of the release or spillage of hazardous material
- An estimate of the quantity released and the rate at which it is being released
- The direction in which the spill or air release is moving
- Personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result
- Potential for fire and/or explosion resulting from the situation
- Estimates of area under influence of release

If the spill or release is determined to be within the on-site emergency response capabilities, the SSO will ensure implementation of the necessary remedial action. If the release is beyond the

capabilities of the site personnel, all personnel will be evacuated from the immediate area and the local fire department will be contacted. The SSO will notify the PM, the CHSO and the National Grid PM. Spills related to the OU-1 groundwater treatment facility and DNAPL recovery system are regulated under the Emergency Response and Release Reporting Plan, which can be found in **Appendix I**.

12.5 Alcohol and Drug Abuse Prevention

Alcohol and drugs will not be allowed on the work site. Project personnel under the influence of alcohol or drugs will not be allowed to enter the site.

Health and Safety Plan Sign-Off

All GEI personnel conducting site activities must read this Health and Safety Plan, be familiar with its requirements, and agree to its implementation.

All other personnel onsite for regulatory, observational and other activities not directly associated with remedial activities must read this Health and Safety Plan for hazard communication purposes.

Once the Health and Safety Plan has been read, complete this sign-off sheet, and return it to the Project Manager**.**

Site Name:
Belle Harbor Site

Activity:

- Groundwater Monitoring
- Soil Sampling
- Gauging and Recovery of DNAPL
- Site Maintenance
- Site Investigations and Remediations
- Excavation and Trenching
- Installation/Abandonment/Maintenance of Wells and Sample Points.

GEI Project No: 093150

I have received and read the Health and Safety Plan, been briefed on it, and agree to its implementation.

Name	Signature	Date	Company	Check if HAZCOM only

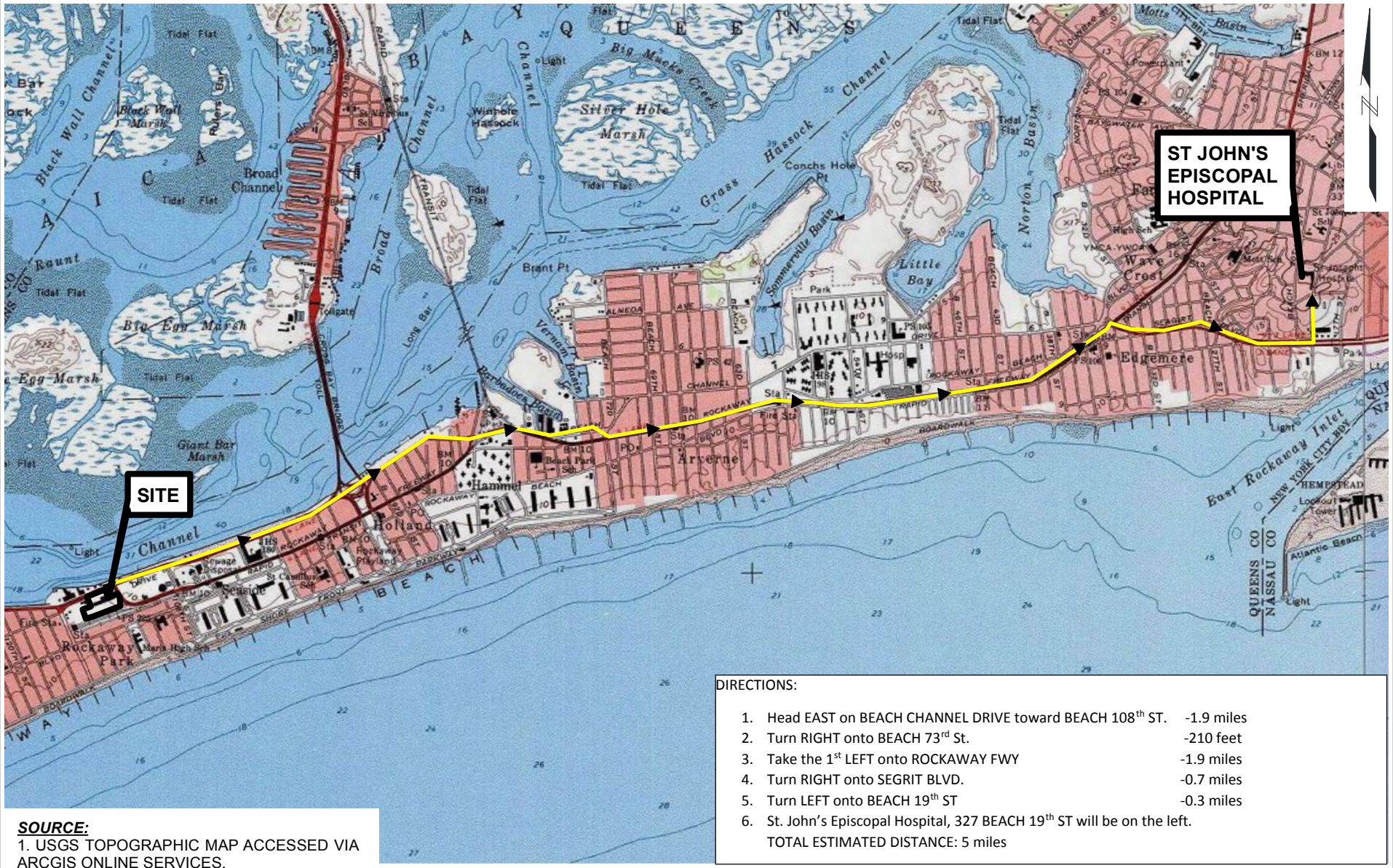
Name	Signature	Date	Company	Check if HAZCOM only

APPENDIX A

SITE-SPECIFIC INFORMATION

DIRECTIONS TO:
Occupational Health Provider
Land, Sea & Air Medical Review Specialists
910 Route 109
North Lindenhurst, NY 11757
631-225-3060

1.	Head east on Beach Channel Dr. toward Beach 108th Street	0.9 mi
2.	Get on Belt Pkwy from Cross bay Blvd	6.8 mi
3.	Follow Belt Pkwy to S Conduit Ave. Take exit 20 from Belt Pkwy	1.7 mi
4.	Get on Belt Pkwy	2.7 mi
5.	Take Southern State Pkwy to County Rd 28 in Babylon. Take Exit 33 from Southern State Pkwy. Continue to follow NY-109E, Destination will be on the right	21.3 mi
6.	Arrive at 910 New York 109 North Lindenhurst, NY 11757	



DIRECTIONS:

1. Head EAST on BEACH CHANNEL DRIVE toward BEACH 108th ST. -1.9 miles
2. Turn RIGHT onto BEACH 73rd St. -210 feet
3. Take the 1st LEFT onto ROCKAWAY FWY -1.9 miles
4. Turn RIGHT onto SEGRIT BLVD. -0.7 miles
5. Turn LEFT onto BEACH 19th ST -0.3 miles
6. St. John's Episcopal Hospital, 327 BEACH 19th ST will be on the left.

TOTAL ESTIMATED DISTANCE: 5 miles

SOURCE:

1. USGS TOPOGRAPHIC MAP ACCESSED VIA ARCGIS ONLINE SERVICES.

0 0.5 1

Miles

Health and Safety Plan
Belle Harbor Shopping Center
Rockaway Park, New York

nationalgrid

GEI Consultants

HOSPITAL ROUTE MAP

Project 093150 | July 2017 | Fig. 1

J:\Projects\National_Grid\Belle Harbor\Remedial Investigation\IRM Work Plan\HospitalRoute.mxd

APPENDIX B

COLD STRESS GUIDELINES

Cold Stress Guidelines

	Symptoms	What to do
Mild Hypothermia	• Body Temp 98-90°F • Shivering • Lack of coordination, stumbling, fumbling hands • Slurred speech • Memory loss • Pale, cold skin	• Move to warm area • Stay active • Remove wet clothes and replace with dry clothes of blankets • Cover the head • Drink warm (not hot) sugary drink
Moderate Hypothermia	• Body temp 90-86°F • Shivering stops • Unable to walk or stand • Confused irrational	• All of the above, plus: • Call 911 • Cover all extremities completely • Place very warm objects, such as hot packs on the victim's head, neck, chest and groin
Severe Hypothermia	• Body temp 86-78°F • Severe muscle stiffness • Very sleepy or unconscious • Ice cold skin • Death	• Call 911 • Treat victim very gently • Do not attempt to re-warm
Frostbite	• Cold, tingling, stinging or aching feeling in the frostbitten area, followed by numbness • Skin color turns red, then purple, then white or very pale skin • Cold to the touch • Blisters in severe cases	• Call 911 • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm, not hot, water
Trench Foot	• Tingling, itching or burning sensation • Blisters	• Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm sugary drink

APPENDIX C

HEAT STRESS GUIDELINES

HEAT STRESS GUIDELINES

Form	Signs & Symptoms	Care	Prevention[3]
Heat Rash	Tiny red vesicles in affected skin area. If the area is extensive, sweating can be impaired.	Apply mild lotions and cleanse the affected area.	Cool resting and sleeping areas to permit skin to dry between heat exposures
Heat Cramps	Spasm, muscular pain (cramps) in stomach area and extremities (arms and legs).	Provide replacement fluids with minerals (salt) such as Gatorade.	Adequate salt intake with meals[1] ACCLIMATIZATION[2]
Heat Exhaustion	Profuse sweating, cool (clammy) moist skin, dizziness, confusion, pale skin color, faint, rapid shallow breathing, headache, weakness, muscle cramps.	Remove from heat, sit or lie down, rest, replace lost water with electrolyte replacement fluids (water, Gatorade) take frequent sips of liquids in amounts greater than required to satisfy thirst.	ACCLIMATIZATION[2] Adequate salt intake with meals 1 only during early part of heat season. Ample water intake, frequently during the day
Heat Stroke	HOT Dry Skin. Sweating has stopped. Mental confusion, dizziness, nausea, severe headache, collapse, delirium, coma.	HEAT STROKE IS A MEDICAL EMERGENCY - Remove from heat. - COOL THE BODY AS RAPIDLY AS POSSIBLE by immersing in cold (or cool) water, or splash with water and fan. Call for Emergency Assistance. 0Observe for signs of shock.	ACCLIMATIZATION[2] Initially moderate workload in heat (8 to 14 days). Monitor worker's activities.

Footnotes:

1.) American diets are normally high in salt, sufficient to aid acclimatization. However, during the early part of the heat season, (May, June), one extra shake of salt during one to two meals per day may help, so long as this is permitted by your physician. Check with your personal physician.

2.) ACCLIMATIZATION - The process of adapting to heat is indicated by worker's ability to perform hot jobs less fluid loss, lower concentrations of salt loss in sweat, and a reduced core (body) temperature and heart rate.

3.) Method to Achieve Acclimatization - Moderate work or exercise in hot temperatures during early part of heat season. Adequate salt (mineral) and water intake. Gradually increasing work time in hot temperatures. Avoid alcohol. Normally takes 8 to 14 days to achieve acclimatization. Lost rapidly, if removed from strenuous work (or exercise) in hot temperature for more than approximately five days.

APPENDIX D

UTILITY CLEARANCE FORMS AND PROCEDURES

Utility Clearance Documentation

Client: _____

Project: _____
Site: _____
Drilling Location ID: _____
Driller: _____
GEI PM: _____
GEI Field Team Leader: _____
Utility Drawings Reviewed: _____
Provided By: _____
Reviewed By: _____
One Call Utility Clearance Call Date: _____
Utility Clearance Received back from (list utilities): _____
Completed By (Company): _____ Date: _____
GEI Staff Responsible for Oversight: _____
Metal Detector Survey (yes/no): _____
Drilling Location Cleared by: _____
Contractor: _____ Date: _____
GEI Staff Responsible for Oversight: _____
Physical Test Pit Clearance Required (yes/no): _____
Contractor: _____ Date: _____
GEI Staff Responsible for Oversight: _____
Hand Clearing Performed: _____ Date: _____
Contractor: _____
GEI Staff Responsible for Oversight: _____

Notes:
Based upon the best available information, appropriate utility clearance procedures were performed for the invasive work specified. If client ordered/site specific deviations from existing GEI utility clearance procedures exist, they are approved by the client signature below.

Client Signature (Optional): _____ Date: _____
GEI, Inc. Representative: _____ Date: _____

Call 1-800-272-4480 TOLL FREE!

LOCATION REQUEST FORM

1. Caller's Name_____
2. Telephone Number_____
3. Contractor_____
4. Contractor's Address_____
5. Work Date ___/___/___ Starting Work Time _____ AM or PM
6. Borough/County_____
7. Street Number_____
8. First Intersection_____
9. Second Intersection_____
10. Type of Work_____
11. Method of Excavation_____
    _____
12. Street _____ Sidewalk _____ Private Property _____

Other (specify)_____
_____
If Private Property: Front _____ Rear _____ Side _____

13. Person to contact_____
14. Telephone Number_____
15. Work Being Done For_____
16. Remarks_____
    _____
17. Serial Number_____
    _____
18. Member
    List_____
    _____

For Your Reference: Today's Date _____ Time_____

Please fill in the above info before you call, it will speed up your response.

APPENDIX E

INCIDENT REPORTING

INCIDENT REPORT FORM

Please attach photographs relating to the incident if possible.

Report No. _____

Site: _____ Project No. _____

Location: _____

Date of Report: _____ Preparer's Name: _____

Name and Address of Injured: _____

Date of Birth _____ Date of Hire: _____ Title/Classification: _____

Division/Department _____ Date of Accident _____ Time: _____

Accident Category: ___ Motor Vehicle ___ Property Damage ___ Fire

___ Chemical Exposure ___ Near Miss ___ Other

For vehicles involved in a motor vehicle incident, please fill out the following information:

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

Please attach photographs of the area the vehicle incident occurred in and of any damage to vehicles involved.

Severity of Injury or Illness: ____ Non-disabling ___ Disabling

____ Medical Treatment ___ Fatality

Amount of Damage: $_____ Property Damaged: _____

Estimated Number of Days Away from Job: _____

Nature of Injury or Illness: _____

CLASSIFICATION OF INJURY:

____ Fractures	____ Heat Burns	____ Cold Exposure
____ Dislocations	____ Chemical Burns	____ Frostbite
____ Sprains	____ Radiation Burns	____ Heat Stroke
____ Abrasions	____ Bruises	____ Heat Exhaustion
____ Lacerations	____ Blisters	____ Concussion
____ Punctures	____ Toxic Respiratory Exposure	____ Faint/Dizziness
____ Bites	____ Toxic Ingestions	____ Toxic Respiratory
____ Toxic Ingestions	____ Dermal Allergy	

Part of Body Affected: _____

Degree of Disability: _____

Date Medical Care Was Received: _____

Where Medical Care Was Received: _____

Address (if off-site): _____

ACCIDENT LOCATION:

Please provide a sketch of the accident location, vehicles involved, and any details as to how the accident occurred in the space below.

Causative agent most directly related to accident (object substance, material, machinery, equipment conditions):

Was weather a factor? _____

Unsafe mechanical/physical/environmental condition at time of accident (be specific):

Unsafe act by injured and/or others contributing to the accident (be specific, must be answered):

Personal factors (improper attitude, lack of knowledge or skill, slow reaction, fatigue):

Level of personal protection equipment required in Site Safety Plan:

Modifications:

Was injured using required equipment?

If not, how did actual equipment use differ from plan?

What can be done to prevent a recurrence of this type of accident (modification of machine; mechanical guards; correct environment training):

Detailed narrative description (how did accident occur, why; objects, equipment, tools used, circumstance assigned duties) (be specific):

(Use separate sheet as required)

Witnesses to accident

Signature of Preparer

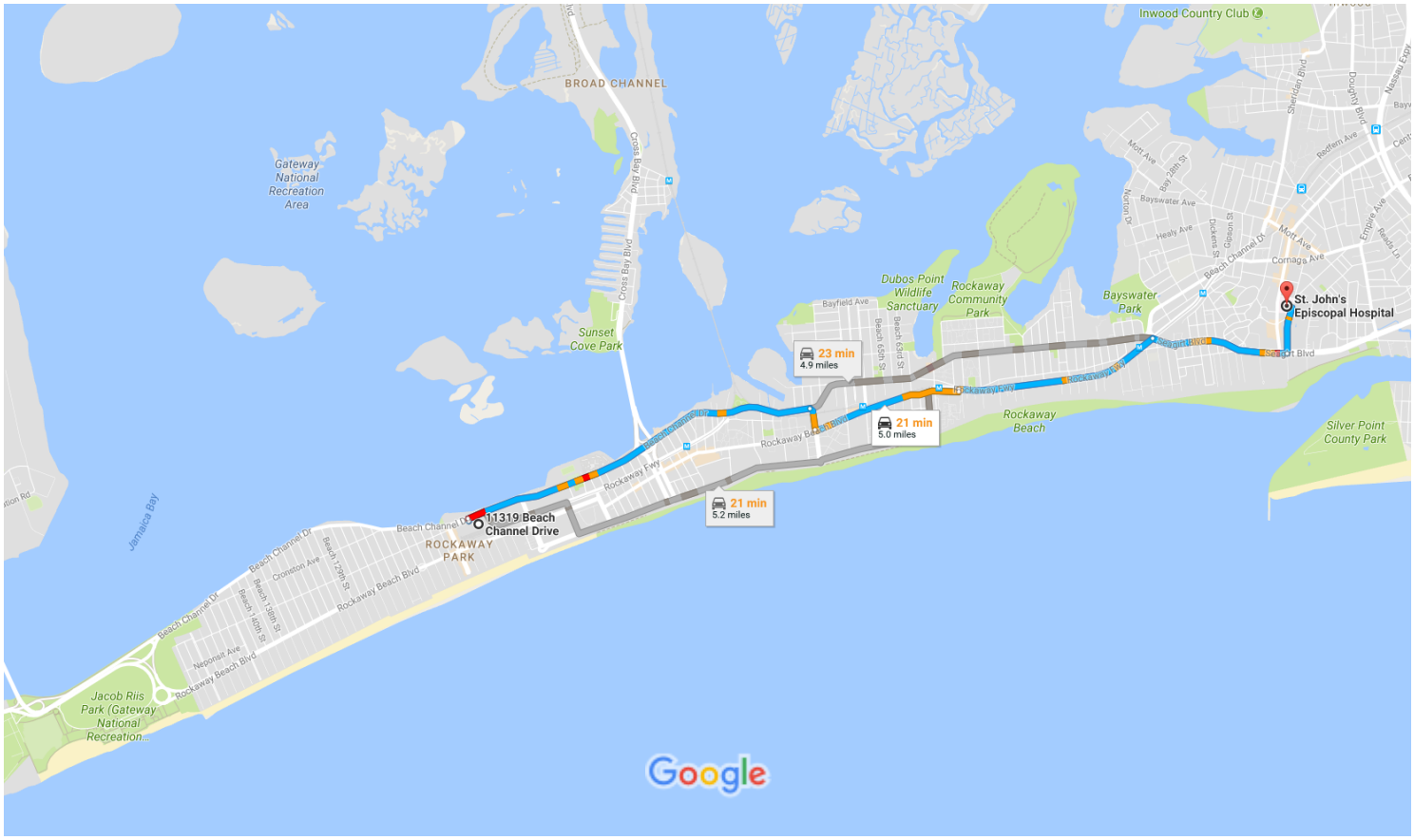
Signature of Site Leader

APPENDIX F

TRAFFIC CONTROL

11319 Beach Channel Dr to St. John's Episcopal Hospital, Queens, NY

Drive 5.0 miles, 21 min



Map data ©2017 Google 2000 ft

11319 Beach Channel Dr

Far Rockaway, NY 11693

1. Head north toward Beach Channel Dr

6 s (59 ft)

Continue on Beach Channel Dr. Take Rockaway Beach Blvd and Rockaway Fwy to Beach 19th St

18 min (4.7 mi)

2. Turn right at the 1st cross street onto Beach Channel Dr

2.0 mi

3. Turn right onto Beach 73rd St

0.1 mi

4. Turn left at the 1st cross street onto Rockaway Beach Blvd

0.8 mi

5. Turn left onto Beach 56th Pl

69 ft

6. Turn right at the 1st cross street onto Rockaway Fwy

1.1 mi

7. Turn right onto Seagirt Blvd

0.7 mi

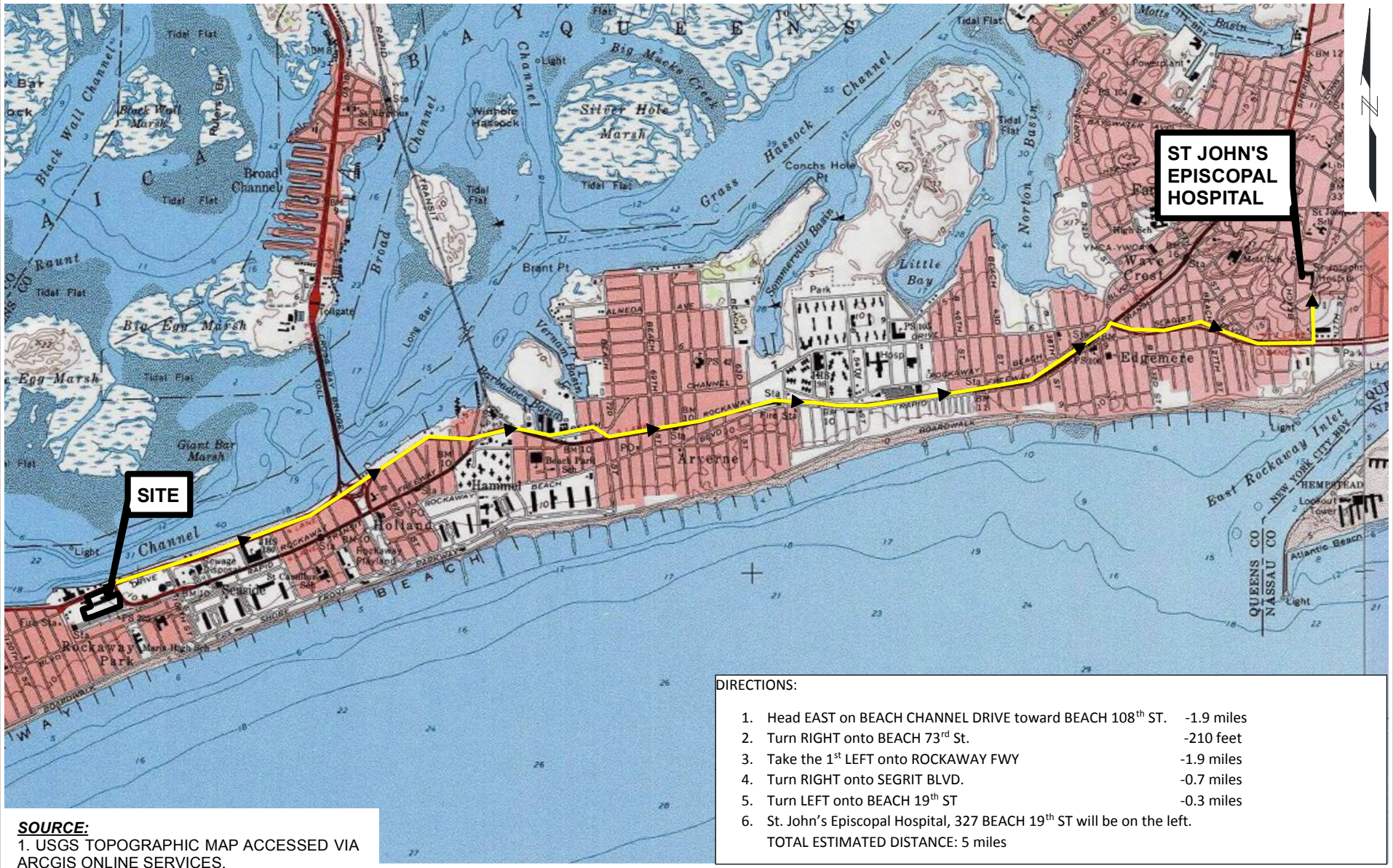
8. Turn left onto Beach 19th St

Destination will be on the left

1 min (0.2 mi)

St. John's Episcopal Hospital

327 Beach 19th St, Far Rockaway, NY 11691



DIRECTIONS:

1. Head EAST on BEACH CHANNEL DRIVE toward BEACH 108th ST. -1.9 miles
2. Turn RIGHT onto BEACH 73rd St. -210 feet
3. Take the 1st LEFT onto ROCKAWAY FWY -1.9 miles
4. Turn RIGHT onto SEGRIT BLVD. -0.7 miles
5. Turn LEFT onto BEACH 19th ST -0.3 miles
6. St. John's Episcopal Hospital, 327 BEACH 19th ST will be on the left.

TOTAL ESTIMATED DISTANCE: 5 miles

SOURCE:

1. USGS TOPOGRAPHIC MAP ACCESSED VIA ARCGIS ONLINE SERVICES.

0 0.5 1

Miles

Health and Safety Plan
Belle Harbor Shopping Center
Rockaway Park, New York

nationalgrid

GEI Consultants

HOSPITAL ROUTE MAP

Project 093150 | July 2017 | Fig. 1

J:\Projects\National_Grid\Belle Harbor\Remedial Investigation\IRM Work Plan\HospitalRoute.mxd

APPENDIX G

HASP ANNUAL CHECKLIST

Belle Harbor MGP Site HASP Annual Checklist	
Have all National Grid procedure revisions been incorporated into HASP?	
Are there any new procedures to be incorporated into the HASP?	
Is all contact information in the HASP current and correct?	
Has the scope of work changed? If so, are changes reflected in HASP?	
Does the Activity Hazard Analysis need to be revised?	
Have any attributes of LIPA property and associated procedures and regulations changed?	
Has GEI obtained the most recent as-built drawings of the transmission/distribution line layout from National Grid?	

APPENDIX H

EMERGENCY EVACUATION PLAN

Emergency Evacuation Plan

In the event of severe weather, a chemical emergency, a fire, or other hazard which warrants evacuation of the personnel on site or working within the Bay Shore community; the following procedures will be strictly adhered to:

1. **IF THE EMERGENCY IS SITE-WIDE (such as severe inclement weather), SOUND THE ALARM** All staff vehicles are equipped with an air horn. The emergency signal blast with the air horn should be a single blast lasting approximately **30 seconds**. If another horn blast happens to occur at the same time or during your blast, do not discontinue yours. Complete your emergency signal. Be aware that other emergency blasts may occur in the event of an emergency.

   IF THE EMERGENCY IS LOCALIZED (such as a fire in the trailer or an accident in the work zone) you do not need to sound the alarm with the air horn. You must yell **FIRE, FIRE, FIRE,** (or other emergency) repeatedly. Make sure that at least one other employee has heard and understood the alarm.

2. **NOTIFY/CALL 911 EMERGENCY OPERATOR.** The employee first observing the fire or other hazard will relocate outside of the immediate area of the hazard,

   DIAL 911 and
   Report the emergency situation indicating that
   THERE IS A FIRE OR OTHER TYPE OF AN EMERGENCY AT:

   [Name and location of emergency]
   The National Grid Belle Harbor Site
   Give Address

3. **EVACUATE!** Select the closest, safest route to exit the site or building and proceed in an orderly and expeditious manner to a prearranged meeting area outside. While in route to the exit, assist in the notification of other employees by re-sounding the alarm to evacuate**. FIRE, EVACUATE!!! FIRE, EVACUATE, FIRE, EVACUATE!!!** While in route from the building(s) or site, take the time to notify the other employees and occupants in the area of the emergency and the necessity for evacuation. For a site-wide evacuation, follow the designated path on the Emergency Evacuation Map.

4. **ASSEMBLE:** After you have heard the GEI air horn emergency signal or after you have been clearly notified by other personnel that you must vacate and/or evacuate your area, you must immediately relocate to the **DESIGNATED GEI ASSEMBLY AREA**. The designated assembly area will be an area outside your work zone that is a **safe distance from the emergency**. Secure your work area if necessary, and if possible**.** As you exit the building or job site, select the closest and safest route and proceed in an orderly manner to the **DESIGNATED ASSEMBLY AREA** where a head count will be taken to ensure that everyone has safely evacuated**. The first person to arrive will conduct the headcount. Use the sign-in sheet (if possible) to help determine who is present on site, but also be sure to determine from other employees who is on site at well (include sub-contractors). Sub-contractor crew chiefs must inform GEI of employee presence.** Be especially cautious as you cross traffic lanes for arriving emergency vehicles and other moving private vehicles.

5. Remain in the assembly area until released to return to work or instructed otherwise.

6. Notify the GEI Project Manager, GEI Corporate Health and Safety Officer, and the National Grid Project Manager of the emergency and actions taken by site personnel.

Appendix C

Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009